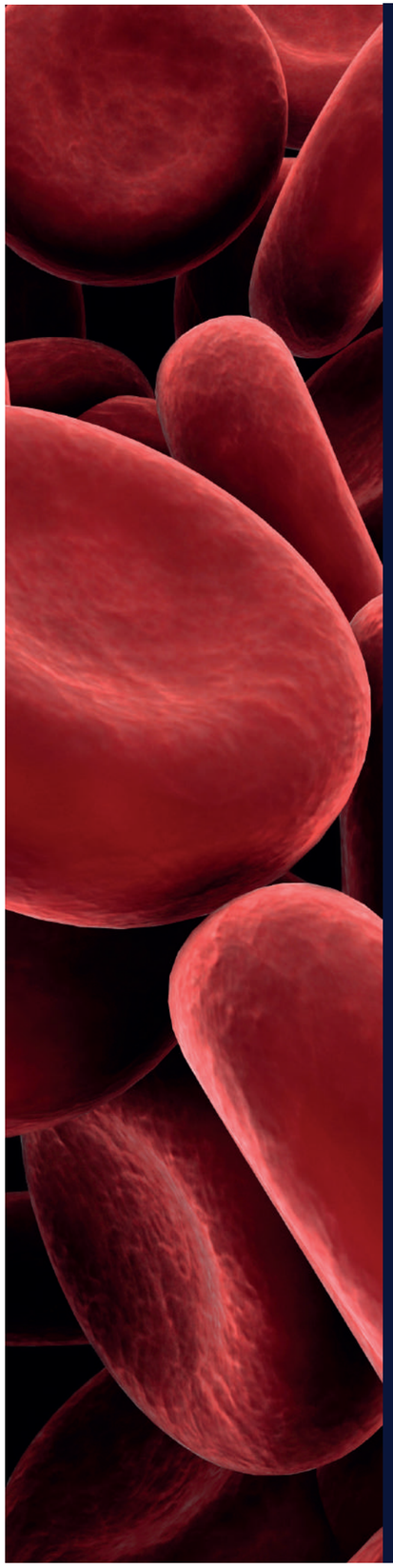

HEMATOLOGY, TRANSFUSION AND CELL THERAPY

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HEMATOLOGY, TRANSFUSION AND CELL THERAPY
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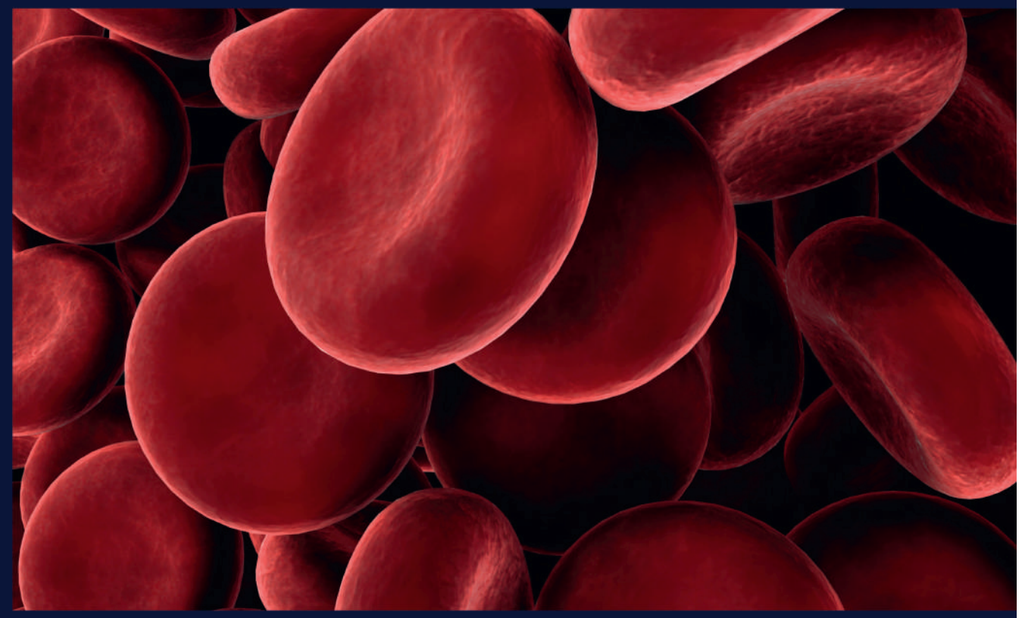

HEMATOLOGY, TRANSFUSION AND CELL THERAPY

VOLUME 43,
Supplement 3,
November, 2021

XIIth Eurasian Hematology Oncology Congress
Abstract Book
10–13 November 2021

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HEMATOLOGY, TRANSFUSION AND CELL THERAPY

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XII Eurasian

Hematology Oncology Congress

EHOC 2021
HYBRID

Abstract Book

10-13 November 2021

EHOG
Eurasian Hematology Oncology Group

Welcome Address

Dear Colleagues,

We are happy to meet you at XIIth Eurasian Hematology-Oncology Congress will be held as a hybrid congress between 10-13 November 2021 at Hilton İstanbul Bomonti Hotel & Conference Center.

We believe deep in our hearts that with its special online concept, EHOC 2021 will fill in a significant gap in our region.

The attendees will be able to enjoy scientific programs in both Adult Hematology & Pediatric Hematology / Oncology as well as Nursing.

This year EHOG is collaborating with the below international societies and groups, they each will have their own session on “Guest Society Day” on November 14.

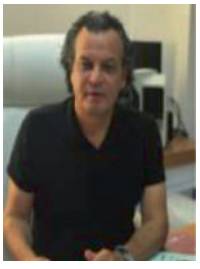
- American Society for Apheresis (ASFA)
- American Association of Blood Banks (AABB)
- Brazilian Association of Hematology, Hemotherapy, and Cell Therapy (ABHH)
- European Leukemia Network (ELN)
- Israel Society of Hematology and Transfusion Medicine
- Russian Oncohematology Society (ROHS)
- Society of Hematologic Oncology (SOHO)
- Society of Medical Oncology Pakistan (SMOP)

Additionally Pediatric Hematology and Pediatric Oncology programs will be co-organized with the Turkish Pediatric Hematology Association and Turkish Pediatric Oncology Group Association.

There will be online oral and poster presentation sessions.

Pharmaceutical companies will get an opportunity to interact with the attendees live in the virtual and physical exhibition area.

We hope that you will benefit in the best way possible from this hybrid version of EHOC 2021 and we are looking forward to organizing a full face-to-face meeting in 2022 in Istanbul.



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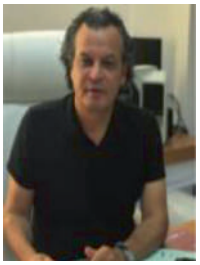
President of Hematology Specialist Association

Giuseppe Saglio

President of EHOC 2021
President of EHOG

Hematology Specialist Association

President



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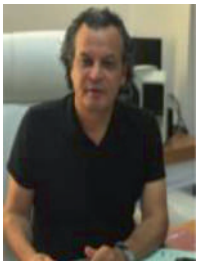
President of EHOG t



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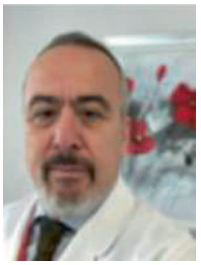
Congress Scientific Secreteriat



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Cengiz Canpolat

Pediatric Oncology Program Chair

Serpil Viera

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Şehmus Ertop

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Tom Spitzer

Tomasz Sacha

Ufuk Abacıoğlu

Uğur Özbek

Vahap Okan

Vera Donnenberg

Volkan Hazar

Yeşim Aydınok

Ylenda De Felici

Yusuf Yıldız

Zafer Gülbaş

Zahit Bolaman

Zbigniew M Szczepiorkowski

Zeba Aziz

Zeynep Karaka

Zühre Kaya

Chairs and Speakers Biographies

Achille Iolascon
Medical Genetics-Advanced Biotechnologies, University Federico II, Italy

Education
1972-78: M.D. University of Naples
1978-81: Post-graduate school in Pediatrics
1982-85: Post-graduate school in Oncology
1986: Ph.D. in Pediatrics

Post-graduate training:
1979: Intern in Medicine, University of Naples, Department of Pediatrics
1981-93: Assistant physician in Pediatrics
1994 –99: Associate professor of Pediatrics
1999 Full Professor of Pediatrics, University of Foggia (Italy)
2000-: Professor of Pediatrics and Chairman of the Dpt. Of Pediatrics, University of Foggia (Italy)
2004: Full professor of Medical Genetics- University Federico II of Naples

Faculty appointments:
Instructor in Medicine
Supervisor of graduate students and post- doctoral students
Professor of "Pathology' at the Nursing School of Naples University
Professor of Pediatric Therapy
Professor of Medical Genetics (1996-97)
Professor of Pediatrics
Professor of Medical Genetics (2004-)

Hospital and Amministrative app:
1980 Research investigastor
1982-89 Genetic counselor at USL 39-Napoli
1990-93 Assistant physician in Pediatrics
1990-1994 Head of Molecular Biology Unity and Medical Genetics of Pediatrics Dpt. of University of Bari
1999:Chairman of the CISME- Interuniversity Center for the Studies on Hereditary Diseases of Evolutive Age
2000-2003- Chairman of Pediatric Dpt. University of Foggia and Head of Molecular Medicine Division
2004- Chairman of Medical Genetics Division of Federico II University and Director of Medical Genetics School of Specialization

Specialty Certification:
1978 -Italian Board of Internal Medicine
1981 -Italian Board of Pediatrics
1985- Italian Board of Oncology
2001- Board Secretary of Eurpean Society for Pediatrics Haematology and Immunology

Memberships in professional and Scientific Societies:
Italian Society of Pediatrics (SIP)
Italian Association of Pediatric Hematology-Oncology (AIEOP)
Italian Society of Hematology (SIE)
European red cell membrane study group

Academic Commitee:
1986 -member of the board commitee of Italian Society of Pediatrics
1988- member of the Italian molecular biology group in Oncology
1990- chairman of the Italian study group on "hemolytic anemia" of the AIEOP

Scientific interests:
since 1978: thalassaemia and haemoglobinopathies
since 1986: oncogenes in pediatric tumors genetic disorders of the red cell membrane
since 1995: stomatocytosis and related diseases
since 1998:hereditary thrombocytopenias
since 1998: genetics of rare inherited disorders

Major Teaching and Clinical responsibilities for the Univerisity of Naples:

1. In charge of Medicine Students
2. Supervision of graduate students and post-doctoral students.
3. Elective course of 'Genetics' at the post-graduate school in Pediatrics of the University of Naples
4. Lessons on pediatric hematology at the 'post-doctoral' school for B.D.

Bibliography (partially listed)
Book: Italian translation of the "Pediatrics' M.Ziai 1980-81-82
'Hematology' chapter in 'Pediatrics' ed.Grasso (in press)
Editorials,Reviews: Molecular Biology of thalassemia in Italian J.Ped.
Molecular Biology of Spherocytosis in It.J,Ped In: Molecular Biology of r.b.c. membrane defects in Hematologogy
Molecular basis of Stomatocytosis- Curr. Op in Hematology
Congenital dyserythropietic anemias- Clinics in Hematology
N° of national and international pubblications: 255
Overall impact factor: more than 500

Ahmad Ibrahim
Hematology/Oncology and Physiological Sciences, National Lebanese University, Lebanon

Ahmad Ibrahim is a full Professor of Medicine, Hematology/Oncology and Physiological Sciences at the Faculty of Medicine of the National Lebanese University, a Professor of Medicine at the Arab University of Beirut, an Associate Professor of Oncology at University of Paris XI, and Clinical Associate-Department of Internal Medicine at the American University of Beirut. He graduated, from the University of Paris VII-School of Medicine in 1987. Then, he pursued a fellowship in Hematology/ Oncology, Immunology (HLA Lab, Professor Jean Dausset- Noble price of Medicine), and Bone Marrow Transplantation at the University of Paris; then, a post fellowship in the department Bone Marrow Transplantation at Fred Hutchinson Cancer Center -Seattle, USA (Professor E.D. Thomas- Noble price of Medicine). Doctor Ibrahim was appointed in 1993 as a full-time Attending Physician/ Associate professor in the Department of Hematology and Bone Marrow Transplantation at the Institute Gustave Roussy (IGR)-Villejuif/ University of Paris XI. In 1997, he moved to Lebanon where he established the first Bone Marrow Transplantation Program at Makassed Hospital-Beirut which was affiliated with IGR/University of Paris XI in a French-Lebanese cooperation. Since 1997, Dr. Ibrahim has been the head of the Division of Hematology/Oncology and the Director of the Bone Marrow Transplantation Program at Makassed Hospital. Since 2004, he has been appointed associate director of research for PhD Programs at the Faculty of Pharmacy/University Paris V. Since 2012. He has been board member of Masters Programs in stem cell engineering and applications at the faculty of Sciences of the National Lebanese University. In 2018, Dr. Ibrahim was the coordinator of the guidelines for Hematological Diseases established for the Ministry of Public Health in Lebanon in cooperation of UNDP. Dr. Ibrahim is currently in advisor of International Clinical Practice Guidelines on the Treatment and Prophylaxis of Venous Thromboembolism in Patients with Cancer (ITAC-CME CPGS). Dr. Ibrahim is actively involved in research particularly in the fields of hematological malignancies and hematopoietic stem cell transplantation. In 1993, he was nominated a core member of the European Organization for Research and Treatment of Cancer (EORTC)- Leukemias Cooperative Groups. In 1996, he was elected member of the French College of Hematology. Since 2009, he has been member of the Board of Directors of the Eastern Mediterranean Group for Blood and Bone Marrow Transplantation (EMBMT). He is member of the American Society of Hematology (ASH), European School of Medical Oncology (ESMO), European Hematology Association (EHA), European Group for Blood and Marrow Transplantation/ Acute Leukemias and Lymphoma working parties (EBMT), and the American Society for Blood and Marrow Transplantation (ASBMT). Dr. Ibrahim is currently the President of the Lebanese Society of Hematology and Blood Transfusion, Key partner of the ASH and EHA. Dr. Ibrahim has taken an active role in the medical community-participating in numerous scientific meetings. He has authored and co-authored more than 300 medical publications and books chapters. He is also co-editor of a book in Hematology (edited in Paris-Maloine Publisher -1992). In 1992, he received the Research Award of the Medical School of the University of Paris VII. In 1993, he received the award of the French League Against Cancer. In 2013, Dr. Ibrahim was awarded by the Lebanese Ministry of Health for his achievement in the field of hematopoietic stem cell transplantation in Lebanon. In 2018, he received the award of achievement from the Pan Arab Hematology Association / EHA in Cairo, Egypt.

Albert D. Donnenberg
Hematology, University of Pittsburgh, USA

Dr. Albert Donnenberg is a Professor of Infectious Disease and Microbiology in the Graduate School of Public Health and a Professor of Medicine in the School of Medicine at the University of Pittsburgh. In addition to teaching, Dr. Donnenberg is the Director of the University of Pittsburgh Cancer Institute Flow Cytometry Facility as well as Director of both the UPMC and the Children's Hospital of Pittsburgh of UPMC Hematopoietic Stem Cell Laboratories. He is also a member of the University of Pittsburgh Cancer Institute and a member of the Graduate Faculty of the Cellular and Molecular Pathology Training Program. In addition, he is the Co-Leader of the UPCI Cancer Stem Cell Program and the Director of Cellular Therapy of the UPMC Aesthetic Plastic Surgery Center. Dr. Donnenberg received his BA from the University of Colorado – Boulder and his PhD from the Johns Hopkins University School of Hygiene and Public Health, where he studied infectious disease epidemiology. Dr. Donnenberg spent many years at Johns Hopkins where he became an Associate Professor of Immunology and Infectious Diseases before he came to the University of Pittsburgh. Dr. Donnenberg's research focuses include:

- immunologic consequences of autologous transplantation in systemic sclerosis;
- haplo-identical hematopoietic stem cell transplantation;
- use of bone marrow-derived and peripheral blood-derived stem and progenitor cells for regenerative therapy;
- the cancer stem cell hypothesis;
- the identification of therapeutic targets on cancer stem cells; and
- technological advances in flow cytometry.

He is on the editorial board of Clinical and Applied Immunology Reviews, and he is an ad hoc reviewer for numerous journals, including these and more:Bone Marrow Transplantation, the Journal of Clinical Investigation, Human Immunology, Natural Immunity, and the Journal of Immunology. Dr. Donnenberg is a member of many professional organizations, including but not limited to, the American Society for Blood

and Marrow Transplantation, the International Society for Analytical Cytology, The Transplantation Society, and the International Society for Stem Cell Research. Throughout his career, Dr. Donnenberg has received numerous awards, most recently the Keynote Speaker of the 2nd Annual Meeting of the Eurasian Hematology Society, Antalya Turkey (2011), the co-corresponding author (with Vera Donnenberg, PhD) for the Best Paper in Clinical Cytometry, ESCCA EuroConference, Dublin, Ireland (2011), and the co-corresponding author (with Vera Donnenberg, PhD) for Editor-in-Chief Selection, Top Articles, Cytometry B (2012).

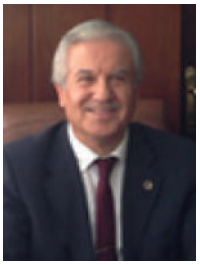
Ali Bazarbachi

Hematology and Oncology, American University of Beirut-Medical Center, Lebanon

Ali Bazarbachi, MD, PhD is a Professor of Medicine (Hematology and Oncology), Professor of Anatomy, Cell Biology and Physiological Sciences, Associate Dean for basic research, and Director of the bone marrow transplantation program at the American University of Beirut-Medical Center. He received his MD and PhD degrees, residency and fellowship training at the University of Paris VII in France. Dr. Ali Bazarbachi's basic and translational research focuses on targeted therapies for leukemia and lymphoma as well as post-transplant pharmacological interventions. He has co-authored more than 300 articles in leading scientific journals including *The New England Journal of Medicine, Science, Journal of Experimental Medicine, The Lancet Oncology, Journal of Clinical Oncology, Blood, Nature Communication, and Cancer Research*. He is the Chairman of the EMBMT Leukemia Working Party, Chairman of the NCCN Lymphoma Group for Middle East and North Africa, past President of the Lebanese Society of Hematology, and Associate Editor of Bone Marrow Transplantation. He garnered multiple prestigious national and international awards including the 2008 award of the French National Academy of Medicine.

Ali Ünal

Haematology-Oncology Department, Erciyes University, Turkey



Prof. Ali Unal, MD, is working at Erciyes University Haematology-Oncology department and Bone Marrow Transplantation Center, in Kayseri, Turkey.

He received his MD degree at Erciyes University Medical School in Kayseri. He started his post graduated training in the department of Haematology at Ankara University Ibni Sina Hospital and subsequently completed at the London University Royal Postgraduate School of Medicine Hammersmith Hospital.

His scientific training in Bone Marrow transplantation and cancer immunotherapy was gained at the Hebrew University Hadassah Medical School Bone Marrow Transplantation Centre (Jerusalem, Israel).

Ali Unal's main areas of research interests focus on: Haematological malignancy, Bone marrow transplantation, lymphoma, cellular therapy and therapeutic apheresis. His clinical research activities are mainly in the area of the lymphoma, leukaemia and tumour immunotherapy.

He is the president of Turkish Society for Experimental Hematology. He is member of Turkish Society for Apheresis, National Hematology Association, European Society for Medical Oncology, American Society for Hematology and European Haematology Association, World Apheresis Association.

He is serving on the editorial board of transfusion and apheresis Science and Turkish Haematology-Oncology Journal. He has published more than 200 scientific articles in international and national journals, peer-reviewed papers, review articles, book chapters, congress abstracts and oral presentations.

Ali Zahit Bolaman

Hematology, Adnan Menderes University, Turkey

Bird place and date: 1959 Fatsa/Ordu Türkiye
Profession: Hematology
Academic degree: Professor
Position:Adnan Menderes University, School of Medicine Hospital, Department of Hematology
School gradutaion: Ege University, School of Medicine
Date of gradutiaon: 1984
Date of graduation for Internal Medicine: 1991
Date of graduation for Hematology: 1993
Institutions that work so far: Dicle University (1987-1994), Denizli State Hospital (1994-1999)
Working time in the Adnan Menderes University: Since 1999
Publications: More than 150 under SCI, More than 100 under Tur Tip Dizin
Mail adress: zahitb@yahoo.com

Alpay Yeşilaltay

Hematology, Başkent Medical Faculty, Turkey

I was born in Istanbul. After Kabataş High School, I graduated from Cerrahpaşa Medical Faculty in 1990. I worked as an assistant doctor in Thoracic Surgery and Biochemistry departments for two years, respectively. Later, I completed Internal Medicine residency in 2000 and Hematology fellowship in 2017., I worked at the UAMS Myelom center in Arkansas/USA between 2015 and 2016. I completed

Cancer Immunology PhD in 2021. I am particularly interested in Multiple myeloma signaling pathway, cancer immunology and oncolytic viruses. I have been working as a director in the TÜBİTAK 1001 research program, which has the effects of viruses on myeloma, about 2 years. After 16 months of training in Acıbadem University Faculty of Medicine Bone Marrow Transplantation, I am still working at Başkent Medical Faculty Hematology Clinic in Istanbul.

Andreas Hochhaus

Hematology and Medical Oncology Jena University Hospital, Jena, Germany

Andreas Hochhaus is Head of the Department of Hematology and Medical Oncology and Coordinator of the University Tumor Center at the Jena University Hospital in Jena, Germany. He is full professor for Internal Medicine / Hematology and Oncology at the Friedrich-Schiller-University, Jena, Germany. He has been interested in the optimization of treatment for chronic myeloid leukemia (CML) and has been involved in the management of randomized CML studies of the German CML Study Group for more than 30 years. As Co-chair of the German CML Alliance, Prof. Hochhaus is focused on enhancing access to clinical trials for all patients, and his special interests include the molecular monitoring of minimal residual disease and mechanisms of resistance in CML. He served as President of the Annual Meeting of the German, Austrian, and Swiss Societies of Hematology and Medical Oncology in 2016 and of the German Cancer Congress in 2020. He is a member of the European Hematology Association (EHA), the American Society of Hematology (ASH), and the International Association of Comparative Research on Leukemia and related Disorders (IACRLRD). Prof. Hochhaus has published over 600 peer-reviewed papers, is Editor-in-Chief of LEUKEMIA and is regularly invited to speak at national and international symposia. He was awarded the Endowed Professorship for Leukaemia Research from the German José Carreras Leukaemia Foundation in 2007.

Angelo Maiolino

Hematology,Federal University of Rio de Janeiro, Brazil

Graduate in Medicine (1982), Universidade Federal do Estado do Rio de Janeiro Residence in Internal Medicine and Hematology (1986-88) at the University Hospital Clementino Fraga Filho, Federal University of Rio de Janeiro. Fellow in Hematology and Bone Marrow Transplantation at the Hospital San Martino, Genova, Italy (1986-1988) PhD in Internal Medicine - Hematology, Federal University of Rio de Janeiro (2000) Professor of Medicine, Department of Internal Medicine, Federal University of Rio de Janeiro. Chief of Hematology Service and Director, Bone Marrow Transplantation Program, University Hospital Clementino Fraga Filho, Federal University of Rio de Janeiro.. Member of the "International Myeloma Working Group"

Anıl Tombak

Hematology, Mersin University Medical Faculty, Turkey

Associate Doctor Anil Tombak, M.D. was born on April 25, 1076. He was graduated from Gazi Anatolian High School at 1994, and then graduated from Cukurova University Medical Faculty at 2000. After that he was trained at Mersin University Medical Faculty Internal Medicine Department, and after Internal Medicine specialization, became a fellow of Hematology at the same University. He became a hematologist in 2013 and still working at Mersin University Medical Faculty, Department of Internal Medicine – Hematology, Mersin, Turkey. Associate Doctor Anil Tombak is married and has a son and a daughter.

Arnon Nagler

Hematology, Tel Aviv University, Israel

- President Hemato-Oncology Center, Chaim Sheba Medical Center, Israel
- Director of the Division of Hematology and BMT, Chaim Sheba Medical Center, Israel (2003-2020)
- Director of Cord Blood Bank, Chaim Sheba Medical Center, Israel
- Professor of Medicine at the Tel Aviv University, Tel Aviv, Israel
- Chair of the ALWP of the EBMT: 2014-2018
- Vice chair of the ALWP of the EBMT: 2018-
- coChair Scientific Council of the EBMT: 2016-2018
- One of the pioneers of the non-myeloablative and reduced intensity/toxicity allogeneic transplantations for both malignant and non-malignant disorders (Blood 1998)
- Established the first public cord blood bank and performed the first cord blood transplantation in Israel
- Active member of the EBMT since 1993
- Leader of the Alternative donor subcommittee of the ALWP of the EBMT from 2008-2010
- Leader of the RIC subcommittee of the ALWP of the EBMT –2010-2014
- Member of multiple national and international societies and committees
- Serves on the Editorial Board of several BMT and Hematology Journals and is a Section Editor for *Leukemia*

Arnon Nagler, M.D., M.Sc., is director of both the Division of Hematology and the Bone Marrow Transplantation and Cord

Blood Bank at the Chaim Sheba Medical Center, Tel-Hashomer, Israel and Professor of Medicine at The Tel Aviv University, Tel-Aviv, Israel.
Dr Nagler received his medical training at the Hebrew University-Hadassah Medical School, Jerusalem, Israel, specializing in Internal Medicine and Haematology at the Rambam Medical Center, Haifa, and in Hematopoiesis (MSc) in TA University, Israel. He carried out a Postdoctoral research fellowship in hematology and bone marrow transplantation at "Stanford University Hospital" Palo Alto, CA, in the USA, from 1986 to 1990.
Dr. Nagler has been working in the fields of bone marrow transplantation for haematological malignancies, for the last 25 years. Dr Nagler is one of the pioneered of the non myeloablative and reduced intensity/toxicity allogeneic transplantations for both malignant and non-malignant disorders (Blood 1998). His main contributions and scientific interests include hematpoietic stem cell transplantation, haematological malignancies, cord blood biology and transplantation and adoptive cell-mediated immunotherapy including NK cell biology.
Dr Nagler established the first public cord blood bank in Israel and performed the first cord blood transplantations from related and unrelated donors in genetic and malignant hematological diseases in Israel.
Dr Nagler is active member of the EBMT since 1993. In 2001 EBMT Annual meeting (Maastricht, the Netherland) his study on IL-18 for GVHD in mice model was chosen for presentation at the presidential symposium. Over the years he was invited speaker in several of the EBMT meetings. Dr Nagler served as the leader of the Alternative donor subcommittee of the ALWP of the EBMT from 2008-2010 and from 2010 -2014 was the leader of the RIC subcommittee of the ALWP of the EBMT.
Dr Nagler serves on the Board of Directors of Netcord organization of cord blood banks and was the Netcord Threasurer from 2010-2013.
Dr Nagler is a member of multiple national and international societies and committees in the field. He serves on the Editorial Board of several journals and was the stem cell transplantation Section Editor for *Leukemia and is currently Associate editor of BMT and served Editorial Boards of numerous Journals in the field of stem cell transplantation and hematology*.
Dr Nagler has written numerous original articles, reviews and chapters for top rank peer-review journals including JCO, Blood, JEM, JI, EJI, Leukemia and many others and is the principal investigator for a multiple clinical studies including first to human trials with novel molecules like Pidilizumab (McAb against PD-1) and BL8040 (novel CXCR4 antagonist). Dr Nagler is inventor of multiple patents including for purging of BM with NK cells and inhibition of fibrosis by Halofuginon.
Dr Nagler has received several awards including the best scientific abstract award of the ASBMT/CIBMR Tandem meeting (2004) and the best clinical abstract award of the NMDP Council Meeting (2004). In addition, Dr Nagler is a popular speaker and has made numerous, invited, international presentations and many Oral presentations on almost annual basis in all international transplantation and haematology meetings - ASH, ASBMT/CIBMTR, EBMT, EHA, Exp Hematology (including a presentation at the presidential symposium) and invited presentation at the Gordon conference (Boston USA).

Ayşegül Ünüvar
Pediatric Hematology&Oncology, Istanbul University, Turkey

After graduating from Istanbul University, Istanbul School of Medicine in 1989, Dr. Ayşegül Ünüvar started her Pediatric Residency in Istanbul University, Istanbul School of Medicine, Department of Pediatrics in the same year, and completed her training in October 1994. Dr. Ünüvar has started to work as a Staff Physician in Istanbul University, Istanbul School of Medicine, Division of Pediatric Hematology&Oncology since July, 1996. Dr. Ünüvar received the title of Associate Professor on April 2, 2002, and was appointed as Professor on December 10, 2009. She still continues his duty as a faculty member in the same Division.
Although she is interested in all subjects of Pediatric Hematology and Oncology, her academic interest is especially in pediatric hemostasis&thrombosis. She was at Wayne State University, Children's Hospital of Michigan, Pediatric Hemostasis Center in 1999 for 6 months with Prof. Dr. Jeanne Lusher and her team. Dr. Ünüvar is currently the Associate Editor of the "Turkish Journal of Hematology" and the member or referee of the editorial board of many national and international journals. She has served as the Chair or Secretary of the Turkish Society of Hematology- Subcommittee of Hemophilia and the Turkish Pediatric Society of Hematology- Subcommittee of Thrombosis, Hemostasis and Hemophilia since October 27, 2002, and has taken an active role in the preparation of the main educational meetings on hemostasis&thrombosis, diagnosis&treatment guidelines. She still continues his active duty in this two Scientific Subcommittees. In addition, she has served as a speaker and chair in many national and some international congresses in the field of Pediatric Hematology and Oncology, General Pediatrics, and also took an active role in the organizing committees in some of these meetings.
Dr. Ünüvar has more than 100 international and national publications, 67 chapters in national books, and more than 300 abstracts presented at the international and national congresses.

Begül Yağcı-Küpeli
Pediatric Hematology-Oncology, Unit at Health Sciences University, Adana Health Research and Training Center, Turkey

After a medical degree in (MD) 2001, residency in Pediatrics in 2006 and residency and master of science degree (MSc) in Pediatric Oncology in 2009 at Hacettepe University in Ankara, G. Begül Küpeli completed his 2-year-obliged state service at Okmeydanı Education and Research Hospital in Istanbul. Beginning from 2012 she started to work at the Department of Pediatrics and Pediatric Hematology/Oncology Unit at Numune Education and Research Hospital, Adana. Principal areas of

investigation of her are pediatric oncology and treatment of pediatric patients with malignant diseases, late effects and complications of cancer treatment and quality of life of cancer patients and survivors. She has focused especially on quality of life of pediatric cancer survivors and difficulties of being a childhood cancer survivor in adult life. She has published numerous SCI journal papers and was awarded by Sadise-Mustafa Köseoğlu Young Investigator Award of Turkish Pediatric Oncology Group (2010). She works as member of editorial board in a group of scientific medical journals. G. Begül Küpeli holding Associate Professorhip in Pediatrics and Pediatric Hematology/Oncology (2013) still works in Department of Pediatrics and Pediatric Hematology/Oncology Unit at Sağlık Bilimleri University, Adana Health Research and Training Center.

Burça Aydın
Cancer Institute, Hacettepe University, Turkey

Burca Aydin is a professor of pediatrics and pediatric oncology. She is a faculty member at Hacettepe University Faculty of Medicine and Cancer Institute. Her main expertise and clinical interest are childhood lymphomas and solid tumors.

Burhan Ferhanoğlu
Hematology, University of Koç, Turkey

2012 – . . . Koc University School of Medicine, Department of Hematology
1998 – . . . V.K.V. American Hospital, Chair of Department of Hematology
1994 – 2012 Professor of Hematology, Cerrahpasa Medical school
1993 – 1994 Associate professor of Cerrahpasa Medical School
1992 – 1993 Fred Hutchinson Cancer Center, Bone Marrow Transplantation Experience
1991 – 1992 Cerrahpasa Medical School, Associate Professor
1990 – 1991 University of Texas, Health Science Center, Department of Hematology, Research Fellow, Basic Science Research
1988 – 1990 Associate professor of Hematology, Cerrahpasa Medical School
1986 – 1988 Cerrahpasa Medical School, Department of Internal Medicine, Hematology Fellow
1984 – 1986 Corum State Hospital, Department of Internal Medicine
1982 – 1984 Military work at Bursa Military Hospital, Department of Internal Medicine
1978 – 1982 Istanbul University, Medical School, Department of Internal Medicine, Resident
1978 University of Istanbul Medical School
1972 Vefa High School, Istanbul

1.Çetiner M, Sucak G, Aydın F, Birtaş E, Yozgatlıgil C, Kalaça S, Akı Z, KalaycıoğluBeşışık S, Ferhanoğlu B, Gülbaş Z, Uzay A, Kaygusuz I, Fıratlı- Tuğlular T, Bayık M; "Evaluation of Life Quality in Hematopoietic Stem Cell Transplantation Patients" (Hematopoyetik Kök Hücre Nakli Yapılan Hastalarda Yaşam Kalitesinin Değerlendirilmesi) "Clinical Hematology" award in Turkish Society of Hematology 33rd National Hematology Congress, Ankara, October 16-19, 2007.

2. Demirsoy ET, Ar MC, Öngören Ş, Üre Ü, Başlar Z, Ferhanoğlu B, Aydın Y, Tüzüner N, Ülkü B, Aktuğlu G, Soysal T; "Prognostic Significance of Serum Vascular Endothelial Growth Factor in Chronic Lymphocytic Leukemia" (Kronik Lenfositik Lösemide Serum Vasküler Endotelyal Büyüme Faktörü Düzeyinin Prognoz Değeri) "Schering Lymphoproliferative Disorders" second rank award in Turkish Society of Hematology 32nd National Hematology Congress, Antalya, 2006.

3. Özbalak M, Yürüyen M, Tüzüner N, Ar MC, Güner Şİ, Çetin G, Öngören Ş, Üre Ü, Başlar Z, Soysal T, Aydın Y, Ülkü B, Demir G, Saçlı FS, Ferhanoğlu B; ""Response rates of germinal center and non-germinal center subtypes of DLBCL to R-CHOP chemotherapy in newly diagnosed diffuse large B cell lymphoma evaluated by immunohistochemistry" (Yeni Tanı Almış Diffüz Büyük B Hücreli Lenfomada İmmünhistokimya Aracılığıyla Değerlendirilen Doku Microarray Yöntemi ile Germinal Merkez ve Non-Germinal Merkez Tiplerinin R-Chop Kemoterapisine Yanıtları) "Roche Non-Hodgkin Lymphoma" award. (Turkish Society of Hematology Roche Industry Award) in Turkish Society of Hematology 32nd National Hematology Congress, Antalya, 2006.

4. Ar MC, Sırma S, Hatırnaz Ö, Öngören Ş, Üre Ü, Başlar Z, Aydın Y, Ferhanoğlu B, Özbek U; "Re-evaluation of Minimal Residual Disease by PCR IG/ TCR and Follow-up of Minimal Residual Disease by Detection of Translocation in patients with Acute Lymphoblastic Leukemia: Preliminary Results" (Erişkin Akut Lenfoblastik Lösemili Hastalarda Minimal Rezidüel Hastalığın PCR IG/ TCR Yeniden Yapılanması ve Translokasyon ile Tesbiti ve İzlenmesi: Ön Sonuçlar) "TSH Clinical Laboratory Hematology" award in Turkish Society of Hematology 30th National Hematology Congress, İstanbul, 2003.

REFEREEING IN

1 Journal of Istanbul Faculty of Medicine
2 Journal of Osmangazi Faculty of Medicine
3 Journal of Cukurova Faculty of Medicine
4 Turkish Journal of Hematology
5 Journal of Clinical Evolution

MEMBERSHIP of SCIENTIFIC SOCIETIES

1 Turkish Society of Hematology
2 International Society of Hematology
3 American Society of Hematology
4 European Bone Marrow Transplantation Society
5 European Hematology Association

Bülent Antmen
Acibadem Adana Hospital, Turkey

Dr Antmen was born in Mersin in 1964. After completing his preuniversity education in Mersin, he graduated from Istanbul University, Cerrahpasa Medical Faculty in 1987. He completed pediatrics specialty education in 1992 in Cukurova University, Faculty of Medicine, and pediatric hematology subspeciality in the Department of Pediatric Hematology Oncology of the same faculty. He was appointed to assistant professorship in 1993, associate professorship in 1999 and professorship in 2005. He has been an observative researcher in the bone marrow transplantation unit of The Royal Free Hospital, London in 1992.
As a member of the Çukurova University Medical Faculty Haemophilia and Pediatric Bone Marrow Transplantation Unit, Dr Antmen has pioneered the performance of radioactive synovectomy and other orthopedic surgical procedures in haemophilia patients with and without inhibitors. He is conducting the research activities on haemophilia patiens as international clinical trials and in collabration with the Department of Sports Physiology. Flow-cytometry, thrombosis and haemostasis are among his main areas of interest. He was in charge of two research projects: one on flow cytometry funded by the Cukurova University, and one on cytotoxicity in some cancer cell cultures funded by The Scientific and Technological Research Council of Turkey. He is currently working on Department of Pediatric HematologyOncology, Haemophilia Center and he is director of Hematopoetic Stem Cell Transplantation unit in Adana Acibadem Hospital, Turkey. He is a member of Turkish Hemophilia Federation and Çukurova Hemophilia Association Boards.

Bülent Zülfikar
Institute of Oncology, Istanbul University, Turkey

After graduating from Istanbul Medical Faculty in 1981, Dr. Zülfikar studied as an Assistant (1982-1986), Specialist (1987-1994) in the Department of Pediatrics of the same faculty. He became Associate Professor in 1991, Pediatric Hematology and Oncology Specialist in 1994, and Professor in 2000. He has worked on hemophilia, childhood leukemia and thalassemia in London and the University of Chicago Children's Hospital.
He was elected as a full member of the Turkish Academy of Sciences (TÜBA) in 2012. He worked as a member in Cerrahpaşa Medical Faculty, Department of Pediatric Hematology/Oncology (2008 – 2019), Ministry of Health National Hemophilia Council Presidency (2010 – 2015), Bezmialem Vakıf University Deputy Chairman of the Board of Trustees (2010 – 2014), Haliç University, School of Nursing Visiting Lecturer (2005 – 2013), Deputy Chairman of the Board of Specialization in Medicine (2008 – 2012), Guest Lecturer at Beykent University Social Sciences Institute (2005 – 2009) and Member of the Higher Education Council (2004-2008).
While continuing the presidency of the the Hemophilia Society of Turkey since its establishment in 1992, he chaired the 28th World Hemophilia Congress held in 2008 and ensured that the congress was held in Istanbul.
He is currently a faculty member (since 1997) and Director of the Institute of Oncology at Istanbul University (since September 2021)
In addition, he provides medical, health-education-consultation services in Istanbul Medicare Health Services and Care Ltd., which he founded in 1993.
He is involved in many national and international projects on hereditary bleeding disorders, as well as being a member of the board of directors and general assembly of many national and international organizations. Dr. Zülfikar has 37 books, more than 150 articles published in Turkey and abroad, and more than 500 studies presented.
He received 26 awards from universities, voluntary organizations, municipalities, private health institutions and industry organizations.

Canan Albayrak
Pediatric Hematology-Oncology, Ondokuz Mayıs University, Turkey

She graduated from Hacettepe University Faculty of Medicine in 1992. She completed his pediatrics specialization at Hacettepe University Faculty of Medicine in 1997. She completed his Pediatric Hematology specialization in Dokuz Eylul University Faculty of Medicine in 2001. She started to work at Konya Necmettin Erbakan University in 2002. She received the title of Associate Professor in 2006. She started working in Ondokuz Mayıs University Faculty of Medicine, Department of Pediatric Hematology and Oncology since 2009. She is still working as a professor at the same university. She is the chairman of Samsun 19 Mayıs Hemophilia Association. Her depertmen has European haemophilia comprensive care center certification. She has been the head of the blood bank since 2016. She is interested in all diseases, including rare diseases related to pediatric hematology, especially bleeding disorders, leukemias and stem cell transplantation. She is married and has a child.

Carmino Antonio De Souza
Hematology, Health Secretary of Campinas City - São Paulo State and Director of Hematology and Hemotherapy Brazilian Association (ABHH), Brazil

Prof. Carmino Antonio De Souza, graduated in Medicine in 1975, Medical Residence in Internal Medicine and Hematology in 1979, Doctorate in 1987, Free Professor in 1996 and Full Professor in 2001 at Internal Medicine Department from University of Campinas, Brazil. Post Doctorate at Department of Hematology, San Martino Hospital from University of Genoa-Italy in 1997-1998 supported by FAPESP. Onco-hematologist acts, particularly, in the Malignant Lymphomas, Chronic Myeloid Leukemia and Bone Marrow Transplantation. He has about of 330 published papers mainly in English and Portuguese; more than 1000 abstracts presented in national and international Congresses; 24 books' chapters most in Portuguese and 34 coordinated theses in post graduated university program. In August 2018, the h-index is 47 and h-10 index is 181 (Google Scholar) and the number of citations in the international literature is about of 10000. Health Secretary of São Paulo State in 1993-1994. Currently is the Health Secretary of Campinas City - São Paulo State and Director of Hematology and Hemotherapy Brazilian Association (ABHH). Is an active member of American Society of Hematology (ASH), European Hematology Association (EHA) and European Bone Marrow Transplantation Group (EBMT) and founder member of the LALNET (Latin America Leukemia Net) and AIBE (Italian Brazilian Hematology Association).

Cengiz Canpolat
Pediatric Hematology Oncology, Acıbadem Altunizade Hospital, Turkey

High School 1973-77 Robert College
University Istanbul University Istanbul Faculty of Medicine 1984
1984-86 Bartın SSK hospital compulsory service
1987-88 Şişli etfal hospital pediatrics specialization
1988-1992 Marmara University Pediatrics Specialization
1992-1995 MD Anderson Cancer Center pediatric hematology Oncology subspecialty
Between 1995 and 2010, Marmara University Faculty of Medicine, Pediatric Hematology Oncology, founder and president
2002-2010 part-time Since 2010 full-time Acıbadem health group pediatric hematology Oncology manager
2012-present Acıbadem Mehmet Ali Aydınlar University, head of pediatric hematology oncology department
I am still working at Acıbadem Altunizade Hospital.

Claudio Cerchione
Hematology, Romagna Scientific Institute, Italy

Dr Claudio Cerchione graduated in medicine with honours from the Medical School at the University Federico II of Naples, Italy (July 2008), with a final thesis in Hematology.
During his Fellowship and PhD studies, Dr. Cerchione studied in detail Hematological malignancies, and his main research topic is Acute Leukemias and Multiple Myeloma.
He started his collaboration in Hematology Department, AOU Federico II, Naples, Italy, in 2006, and there he completed with honours his Fellowship in July 2014 and his PhD program in May 2017.
Since 2018, he works in Hematology Unit of Istituto Scientifico Romagnolo per lo Studio e la Cura dei Tumori (IRST) IRCCS, where he is Head of Myeloma Research Group at Istituto Scientifico Romagnolo per lo Studio e la Cura dei Tumori (IRST) IRCCS, where he is Principal Investigator of many clinical trials company sponsored and non-company sponsored.
He has spent international research experiences in Friedrich-Wilhelms Universität, Bonn, Germany, in Universitade de Coimbra, Portugal, collaborating in their clinical and research projects, and in MD Anderson Cancer Center, Houston, USA, where he has been nominated International Ambassdor of SOHO (Society of Hematologic Oncology).
He is member of the editorial boards of many scientific journals, or Reviewer for several highly cited international journals and member of several international societies and President of Society of Hematologic Oncology Italy (SOHO Italy).
In 2018/2019 he was nominated by EHA as one of the winners of Clinical Research Training in Hematology.
He is author/co-author of many papers in peer-reviewed international journals.

Dana Parness
Tel Aviv Medical Center, Israel

Education
2021-Second year of studding palliative care nurse practitioner – Lev academic Center Jerusalem
2018- oncology nurse-Meir Nursing school of the Tel Aviv university
2016- nurse- Sheinborn Nursing school of Tel Aviv University
2014-B.Ed BA- kibbutzim collage of education and art Tel Aviv

Courses and education programs
2020-Bone marrow transplant nursing- Tel Aviv medical Center
2019- Palliative care nursing- Hillel Yaffe Medical Center's academic nursing school

Professional Experience
2016-Bone marrow transplant nurse at the Tel Aviv medical Center
Conferences and publications: car T cells – R.Gold, S.Dolov, D. Parness, A.Halled, B.Yahini. Israeli Journal of oncology nursing #32, April 2020

Additional Interests
Professional ballet and modern dancer, teacher Israel, USA 1992-2000
Professional actress- stag TV movies Israel USA1998-2010

Dante Mário Langhi Júnior
Hematology, the Federal University of São Paulo – Paulista Medical School, Brazil

Graduated in medicine.
Master in Medicine – PhD in Hematology and Hemotherapy;
Adjunct professor of Hematology and Hemotherapy at the Santa Casa Medical School;
Affiliate Professor of Hematology and Hemotherapy at the Federal University of São Paulo – Paulista Medical School;
President of the Brazilian Association of Hematology, Hemotherapy and Cellular Therapy – ABHH.

Demet Çekdemir
Hematology,Tepecik Education and Research Hospital, Turkey

Education
Medical Faculty: Ege University, School of Medicine, Izmir, Turkey (1994-2000)
Residency: Ege University, School of Medicine, Histology- Embriology, Izmir, Turkey (2001-2002)
Residency: Celal Bayar University, School of Medicine, Internal Medicine, Manisa, Turkey (2002-2007)
Fellowship Programme in Turkey: Ege University, School of Medicine, Department of Hematology, Izmir, Turkey (2007-2012)
Queen Mary University, London in the Barts Cancer Institute Centre for Haemato - Oncology, London, UK (2010-2011)

Work Experience
Ege University, School of Medicine, Department of Hematology, Izmir, Turkey (2007-2012)
Queen Mary University, London in the Barts Cancer Institute Centre for Haemato - Oncology, London, UK (2010-2011)
Sakarya University, School of Medicine, Department of Hematology, Sakarya, Turkey (2012-2014)
Bone Marrow Transplantation Unite, Anadolu Medical Center, In Affiliation Johns Hopkins Medicine, Kocaeli, Turkey (2014-2019)
Ministry of Health of The Republic of Turkey, Tepecik Education and Research Hospital (2019-present)

Professional/Academic Affiliations
Turkish Society of Hematology
Hematology Specialist Association
European Hematology Association
Turkish Society of Apheresis
Turkish Medical Association
Turkish Internal Medicine Specialist Association
Leukemia Lymphoma Myeloma Patients and Research Society Association
Clinical Research Association
International Society of Hematology

Deniz Sargın
Hematology, Medipol University, Turkey

ACADEMIC BACKGROUND
İstanbul University, Istanbul School of Medicine (1967–1973)

ACADEMIC EDUCATION
1967–1978 Istanbul School of Medicine, Internal Diseases Department Internal Diseases Specialisation
1979 –1983 Istanbul University, İstanbul School of Medicine, Internal Diseases Department
Specialist Physician at the Haematology Unit
1983 Internal Diseases Associate Title
Istanbul School of Medicine Internal Diseases, Associate Doctor at the Haematology Unit
1988 Professor Title
1988 -Istanbul School of Medicine Internal Diseases, Professor Doctor at the Haematology Unit
2010 Subspecialisation in Haematology

PROFESSIONAL EXPERIENCE
1979 - Istanbul School of Medicine, Internal Diseases Haematology Unit
1983 Istanbul School of Medicine Internal Diseases Department, Academic duties as a University Associate
1992 - Establishment of the Intensive chemotherapy and stem cell unit
1999 - Istanbul School of Medicine, Internal Diseases Haematology Unit, Responsible Lecturer at the Marrow Transplant Inpatient Unit
1999 - Istanbul School of Medicine, Head of Hospital Transfusion Commission
1998–2000 Istanbul School of Medicine, Operational Director of Revolving Funds, Head of Purchases Commission
2000–2004 Istanbul School of Medicine, Deputy Dean
2002–2004 Istanbul School of Medicine Head of Ethical Committee
2002-2009 Istanbul School of Medicine Head of Transfusion Commission

2002–2013 Istanbul School of Medicine, Member of Board of Directors and Consulting Physician at Marrow Bank
January 2014- Medipol University School of Medicine, Lecturer and Responsible Lecturing Member of Adult Marrow Transplant Unit
January 2014- Medipol University School of Medicine Chairman of Transfusion Commission

COURSES AND TRAINING
1989–1990 London, Royal Free Hospital; Marrow Transplant Unit

ACADEMIC ACTIVITIES
Istanbul School of Medicine 4th Semester Haematology Theoretical Course
3rd, 4th, 5th,6th Semester Haematology Practical Courses
Istanbul School of Medicine Internal Diseases Specialisation in Medicine Student Thesis Advisor
Istanbul University Authoring books for patient school programmes and contribution to lecture programmes
2010 Haematology subspecialisation
2013–2019. . . Haematology lectures for 3rd and 4th Year Medical Students at Medipol University School of Medicine

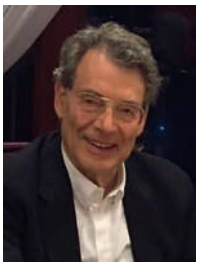
MEMBER OF
Turkish Haematology Association
European Group For Blood And Marrow Transplant

SCIENTIFIC INTERESTS
Haematological Malignant Diseases
Allogeneic and autologous stem cell treatment of hematologic malignant diseases
Stem cell plasticity
Use of autologous stem cells in ischemic heart disease
Use of autologous stem cells in autoimmune diseases, particularly multiple sclerosis

Deniz Yılmaz Karapınar
Pediatric Hematology, Ege University, Turkey

Education (degrees)
2012-2021: Professor, Department of Pediatric Hematology, Ege University School of Medicine, Izmir, Turkey
2006- 2012: Associate Professor, Department of Pediatric Hematology, Ege University School of Medicine, Izmir, Turkey
2004-2006: Clinical Specialist, Department of Pediatric Hematology, Ege University School of Medicine, Izmir, Turkey
2003-2004: Clinical Observer and Researcher, Children's Hospital of Pittsburgh, Department of Pediatric Hematology and Oncology and Bone Marrow Transplantation, Pittsburgh, Pennsylvania, USA.
1999- 2003: Fellowship, Department of Pediatric Hematology, Ege University School of Medicine, Izmir, Turkey
1994-1999: Residency, Department of Pediatrics, Ege University School of Medicine, Izmir, Turkey
1988-1994: Medical doctor, Ege University School of Medicine, Izmir, Turkey

Dieter Hoelzer
Hematology, Onkologikum Frankfurt, Germany



Dieter Hoelzer is a former Professor of Medicine and Hematology and an expert on acute leukemias. He founded the German Adult ALL Study Group (GMALL) with 7 multicenter studies in >145 participating hospitals and the European Working Group on Adult Acute Lymphoblastic Leukemia (EWALL). He currently chairs the Medical Advisory Board of the German Carreras Leukemia Foundation, Advisory Board member of the Society for Hemato-Oncology (SOHO) and the Medical Council and the Foundation Board of the DKMS (Deutsche Knochenmark Spender Datei). Prof. Hoelzer received several awards for cancer research and therapy including those of the German Cancer Society, the "Deutsche Krebshilfe", the Johann-GeorgZimmermann-Price, the San Salvatore Award and the European Leukemia Network Merit Award. He is an honorary member of the Hematological Societies of Austria, Hungary and Germany (DGHO) and received the doctor honoris causa from the University of Athens and Pavlov First St. Petersburg State Medical University. Prof. Hoelzer is author or co-author of more than 800 peer-reviewed publications and co-author of international textbooks, such as Oxford textbook of Oncology, the forthcoming 21st Edition of Harrison's principles of Internal Medicine and an editorial for the New England Journal of Medicine

Dilek Gürlek Gökçebay
Pediatric Hematology Oncology, University of Health Sciences Ankara City Hospital, Turkey

Assoc. Prof. Dr. Dilek Gürlek Gökçebay was born in Ankara in 1980. She graduated from Gazi University Faculty of Medicine in 2004. She completed Pediatrics training at Dr Sami Ulus Pediatrics Training and Research Hospital between 2005-2010, and Pediatric Hematology specialization training at Ankara Child Health and Diseases Hematology Oncology Training and Research Hospital between 2010-2014. Between 2014 and 2018, worked as a pediatric hematology specialist and the responsible physician of the Blood Center at Ankara Keçiören Training and Research Hospital. She received the title of Associate Professor in 2017. She attended Transfusion Medicine, Blood Banking and Hemapheresis Training organized byTurkish Society of Hematology

between September 2017 and March 2018. In April 2018, she worked as an observer researcher at the Universtatsklinikum Erlangen Immunohematology Laboratory in Nuremberg, Germany. Since 2019, she has been working as an educator at the Ankara City Hospital Pediatric Hematology Oncology Department, and also at the Transfusion and Apheresis Center. Her interests are Transfusion Medicine, Blood Banking, Childhood Leukemias, Hereditary and acquired anemias, Platelet and leukocyte disorders and Coagulation disorders. She has more than 30 articles published in international journals and his publications are cited in more than 60 articles.

Elif Birtaş Ateşoğlu
Hematology, Koç University, Turkey

Oct 2020 Koç University School of Medicine
Associate Professor
Research Hematopoietic Stem Cell Transplatation, Lymphoma
Topics >30 International Publications
2018-2020 Anadolu Medical Center, Hematology and Bone Marrow Transplatation Unit
Associate Professor
2016-2018 Kocaeli University - Faculty of Medicine, Department of Internal Diseases, Division of Hematology
Associate Professor Bone Marrow Transplatation Unit Chief
2010-2016 Kocaeli University - Faculty of Medicine, Department of Internal Diseases, Division of Hematology
Asisstant Professor
2007-2010 Dr. Lütfi Kırdar Kartal Training and Research Hospital
Compulsory Service
2003-2007 Marmara University - Faculty of Medicine, Department of Internal Diseases, Division of Hematology
Susbspeciality
1998-2003 Marmara University - Faculty of Medicine, Department of Internal Diseases
Residency
1991-1996 Marmara University - Faculty of Medicine Licence
1990-1991 Hacettepe University - Faculty of Medicine Licence

Elif İnce
Pediatric Hematology and Oncology Department, Ankara University School of Medicine, Turkey

Elif Ince has been an Attending Physician at the Ankara University School of Medicine, Ankara, Turkey, since 2006. Dr Ince graduated from Erciyes University Medical Faculty, Kayseri, Turkey, in 1993. She completed her Pediatric Residency and Pediatric Hematology and Oncology Fellowship at Long Island Jewish Schneider Children's Hospital, New York, USA in 2001 and 2004, respectively. Following her pediatric hematology and oncology training, she completed a one-year Bone Marrow Transplantation Fellowship at the Pediatric Bone Marrow Transplantation Unit, Columbia University, New York, USA.

Erol Erduran
Pediatric Hematology and Oncology,Karadeniz Technical University, Turkey

I graduated from the school of medicine in 1983 and finished my residency in pediatrics in 1990. I became associate professor in 1995, and professor in 2000. I was the chairmen of Trabzon Branch Office of Turkish Medical Association between 1995-1999. At the same time, I was the vise-chancellor in Farabi Research Hospital of Karadeniz Technical University in Trabzon. After that, I was a member of local ethics committee and board member of the faculty of medicine between 2000-2010. I've been the chairmen of department of pediatric hematology and oncology for 21 years. I had the chairmen of Department of Pediatrics for 9 years and I've been the same academic assignment for one year. I have been studying in Karadeniz Technical University, School of Medicine, Department of Pediatrics since 1985. I am interested in idiopathic thrombocytopenic purpura (ITP), hemophilia, primary and secondary hemophagocytic lymphohistiocytosis, langerhans cell histiocytosis, apoptosis, nutritional anemia, bone marrow failure, iron overload diseases, Crimean Congo Hemorrhagic disease, malign hematology (leukemias, lymphomas, chronic leukemias and other hematologic malign diseases), cancers in childhood, benign hematology (anemies, storage and infiltirative diseases, qualitative and quantitative leukocyte disorders, etc). I am the vice-president of Karadeniz Hemophilia Association which is a regional hemophilia association in Trabzon for 15 years and I am the chairmen of Trabzon Leukemic Children Association for 16 years. I have been the chairmen of Internal Medical Sciences of Karadeniz Technical University Medical School for 5 years. I have been a member of executive board of Karadeniz Technical University Training, Research and Practice Hospital for 5 years. I am the chairman of the health sciences ethics committee for 5 years. I have 100 articles published in international journals and approximately 200 articles in national journals. I am invited and attended a lot of national and international congresses as a speaker and a chairperson. I am married and I have two children.

Ferah Yıldız
Radiation Oncology, Hacettepe University, Turkey

Dr. Ferah Yıldız graduated from Ankara University Faculty of Medicine in 1990. She started her residency training programme in Radiation Oncology in 1991 and got her position as Attending Physician in 1996. She worked as a research fellow in University of California, Irvine between 1996-1997. Dr. Yıldız is a member of Turkish Radiation Oncology Society and dealing with breast cancer, gynecologic cancers, pediatric tumors, gastrointestinal neoplasms and Lymphoma.

Franca Fagioli
University of Turin, Italy

WORK EXPERIENCE
07/2019 – CURRENT

FULL PROFESSOR OF PEDIATRICS
Department of Public Health and Pediatrics - University of Turin, Turin, Italy
2016 – CURRENT

DEPARTMENT HEAD - PEDIATRICS AND PEDIATRIC SPECIALITY DEPARTMENT
A.O. U. Città della Salute e della Scienza di Torino, Turin, Italy
2007 – CURRENT

HEAD OF S.C. PEDIATRIC ONCO-HEMATOLOGY AND TRANSPLANT CENTRE
A.O.U. Città della Salute e della Scienza – Presidio Infantile Regina Margherita, Turin, Italy
2010 – CURRENT

HEAD OF THE INTERREGIONAL NETWORK OF PEDIATRIC ONCOLOGY - PIEDMONT AND VALLE D'AOSTA
2018 – 06/2019

ASSOCIATE PROFESSOR OF PEDIATRICS
Department of Public Health and Pediatrics - University of Turin, Turin, Italy
1999 – 2017

HEAD OF S.S. STEM CELL TRANSPLANT CENTRE AND CELL THERAPY
A.S.O. O.I.R.M Sant' Anna and Regina Margherita Children's Hospital, Turin, Italy

EDUCATION AND TRAINING
2002 – Turin, Italy
SPECIALIZATION IN PEDIATRICS, CUM LAUDE – **University of Turin**
1992 – Ferrara, Italy
SPECIALIZATION IN HEMATOLOGY, CUM LAUDE – **University of Ferrara**
1988 – Ferrara, Italy
MEDICINE AND SURGERY DEGREE – **University of Ferrara**

NETWORKS AND MEMBERSHIPS
Memberships

Member of the Turin Medical Academy
Scientific Advisor of IIGM (Italian Institute of Genomic Medicine)
President of FIEOP (Italian hematology and Pediatric Oncology Foundation) - 2019-2021
President of AIEOP (Italian Association of Pediatric hematology and Oncology) - 2016-2018
Vice President of ISG (Italian Sarcoma Group) 2018-2021
Member of several scientific societies such as AIEOP, GITMO, EBMT, ITCC, AICC, SCR, SIP, SIE, SIOPE.
ISG Italian pediatric representative for EURAMOS
Governing Council Member - GISM (Italian Mesenchymal Stem Cell group)
Board of Directors Member -Compagnia di San Paolo– 2012-2020
Board of Directors Member - HUGEF (Human Genetics Foundation) and IIGM (Italian Institute of Genomic Medicine) – 2016-2020
Board of Directors Member - Specchio dei Tempi
Board of Directors Member - Gigi Ghirotti Charitable Association

TEACHING
Pediatrics
School of Medicine and Surgery - University of Turin
School of Specialization in Pediatrics - University of Turin
Orthoptist and ophthalmological assistance - University of Turin
Pediatric Oncology
Master of Psycho-Oncology - University of Turin
School of Pediatric Nursing - University of Turin
Hematology and Pediatric Oncology

School of Pediatrics - University of Turin
School of Neuropsychiatry - University of Turin
Professor at Biomedical Science and Oncology PhD – University of Turin-

Director - Master in emergency emergencies in pediatric age - University of Turin
Training activities for internships students

SCIENCE AND RESEARCH
Clinical and translational research focused on the study of new therapeutic strategies for the treatment of tumors in children, including integrated therapeutic strategies such as:

classic chemotherapy with new and less toxic drug
targeted therapies with monoclonal antibodies or small molecules that inhibit specific intracellular targets
inducers of a specific immune response against the tumor, such as CTL and CIK

isolation, identification and expansion of hematopoietic and mesenchymal stem cells and possible tissue regeneration mechanisms
Scientific responsible for international, national and regional research projects.
Speaker and/or moderator for lots of national and international congress and seminars.
Many years of experience in conduction clinical studies in accordance with Good Clinical Pratices
Author of over 320 scientific publications in international journals - *H-index:* 51

Francesco Passamonti
Hematology, University of Insubria, Italy

Education
1991 M.D. University of Pavia, School of Medicine, Pavia, Italy
1996 Board in Hematology, (summa cum laude), University of Pavia, Medical School, Pavia, Italy

Work Experience
1991-1998 Physician staff, Hematology, I.R.C.C.S. Fondazione Policlinico San Matteo, Pavia, Italy.
1998-2010 Hematologist, Division of Hematology, IRCCS Fondazione Policlinico San Matteo, Pavia.
1998-2015 Assistant Professor of Hematology, University of Pavia, Pavia, Italy
2010-now Head, Hematology, A.S.S.T. Sette Laghi, Ospedale di Circolo, Varese, Italy (Certified)
2016-2018 Associate Professor of Hematology, University of Insubria, Varese, Italy
2018- Full Professor of Hematology, University of Insubria, Italy.

Research interest
Biology, diagnosis, prognostication and therapy of myeloproliferative neoplasms (MPN). Principal investigator of several clinical trials in MPNs, conducted in accordance to GCP since 1998

Scientific Publications
Author and co-author of several peer-reviewed scientific articles http://www.pubmed.org in medical journals including New England Journal of Medicine, Blood, Journal of Clinical Oncology, Leukemia, Haematologica, American Journal of Hematology. He served as Principal investigator in many clinical trials in Hematology.
H Index (Scopus), Jan 2021: 65
Citation Index (fonte Scopus): 18125
Top Italian Scientis (Medicine) ranking: 138°

Research Groups
Member, International Working Group on Myeloproliferative Neoplasms Research and Treatment (IWG-MRT)
Member, European LeukemiaNet on MPNs
Co-chair, Workpackage MPN, GIMEMA

Editorial Activity
Editorial board of the American Journal of Hematology.
Peer-reviewer for several medical Journal including The New England Journal of Medicine, Blood, Journal Clinical Oncology, Leukemia, Haematologica/The Hematology Journal, Leukemia & Lymphoma, American Journal of Hematology, Annals of Hematology.

Professional Society
Italian Society of Hematology; European Hematology Association Ordine Medici Provincia Varese: 07243

Francesco Saglio
Pediatric Onco-Hematology, Clinical Unit Cell Therapy and Stem Cell Transplantation Unit, AOU Città della Salute e della Scienza di Torino, Turin, Italy

Education
MD Università degli Studi di Torino (Italy) 2001- 2007
Pediatrics Università degli Studi di Torino (Italy) 2009-2014
Post-doctoral Fellowship Baylor College of Medicine, TX, US 2011-2012
PhD Biomedical Sciences & Oncology Università degli Studi di Torino (Italy) 2014- 2018

Working Experiences
2014 - 2015 Part-time Attending Physician Pediatric Emergency Room, AOU Città della Salute e della Scienza di Torino, Turin, Italy
2015 - 2017 Attending Physician Pediatric Onco-Hematology, Cell Therapy and Stem Cell Transplantation Unit, AOU Città della Salute e della Scienza di Torino, Turin, Italy
2017- now Full-time position Attending Physician Pediatric Onco-Hematology, Cell Therapy and Stem Cell Transplantation Unit, AOU Città della Salute e della Scienza di Torino, Turin, Italy
2021-now Director Clinical Unit Cell Therapy and Stem Cell Transplantation Unit, AOU Città della Salute e della Scienza di Torino, Turin, Italy

Main areas of interest
Main areas of interest are the immunological aspects of hematopoietic stem cell transplantation in the pediatric population especially in relation to the opportunity to generate virus and leukemia directed cytotoxic T cell lines to be used in adoptive cell therapy protocols. Experience in translational research and in the management of GCP compliant phase I-II and III clinical trials.

Giovanni Martinelli
Hematology, University of Bologna, Italy

Work Experience
From 2018-present Scientific Director, IRCCS Istituto Romagnolo per lo Studio dei Tumori "Dino Amadori"- IRST and **Associate Professor in Hematology** Alma Mater Studiorum, University of Bologna, Institute of Hematology "L. and A. Seràgnoli"
2005 – 2017 Associate Professor in Hematology –, Department of Experimental, Diagnostic and Specialty Medicine (DIMES), University of Bologna. **Responsible of the Laboratory of Molecular Biology**, Institute of Hematology "L. and A. Seràgnoli"
January 1993 – 2005 Medical Doctor for Prof. Sante Tura and Prof. Michele Baccarani, Institute of Hematology "L. e A. Seràgnoli", University of Bologna Medical School. Responsible of the Laboratory of Molecular Biology.
1991-1993 Research and clinical training, Institute of Hematology and Oncology "Seràgnoli", University of Bologna.
1990-1991 Research and clinical training, Institute of Biological Sciences, University of Verona.
1989 Specialist in General Hematology, U.S.L. 47, Mantova, Italy.
June 1988-November 1988 Specialist in Hematology, U.S.L. 31, District of Mantova City, Italy, and U.S.L. 29, District of Volta Mantovana, Italy.
January 1984-1988 Research and clinical training as Resident Physician, Institute of Medical Pathology (Division of Hematology, University of Verona Medical School).

Other Experience and Professional Memberships

- Società Italiana di Ematologia Sperimentale (SIES)
- Member and Vice President of the Consiglio Direttivo SIES
- Società Italiana di Ematologia (SIE)
- American Society of Haematology (ASH)
- American Association for the Advancement of Sciences (AAAS)
- American Association for Cancer Research (AACR)
- European Haematology Association (EHA)
- American Society of Clinical Oncology (ASCO)
- European Association for Cancer Research (EACR)
- European LeukemiaNet (Progetto Europeo VI PQ)
- Gruppo Italiano Malattie Ematologiche dell'Adulto (GIMEMA) - Working Party Leucemie Acute
- COST Action BM0801 (EuGESMA)

Reviewing Activities

- Haematologica
- Leukemia
- Blood
- American Journal of Hematology
- Clinical Leukemia
- Cancer
- Hematological Oncology
- Neoplasia
- Annals of Hematology
- Editor-in-Chief: Hematology Reports

International Projects conductions & Grant applications:

- Co-operator in the following Research projects MURST - COFIN 2001 – 2002 – 2003; Ricerca fondamentale orientata 2002 – 2003;
  Principal proposed in the RFO 60% 2007 and 2008;
  FIRB 2001 – 2003 projects.
  Scientific Responsible in the FIRB 2006 project.
- Principal Investigator AIRC Grant Proposal 2004, AIRC 2007, AIRC 2010.
- Responsible for Research Unit of PRIN 2008 project; Scientific Responsible of two projects on Bando Ministero Salute 2009, and one project on Bando Ministero Salute Ricerca Finalizzata 2009.
- FP7-HEALTH-2012-INNOVATION-1 Seventh framework programme 2011
- Proponent and Principal Investigator of financed International project: "Next Generation Sequencing platform for targeted Personalized Therapy of Leukemia - NGS-PTL".
- Innovative Medicine Initiative 2: Responsible of Work Package in the financed International project: "Healthcare Alliance for Resourceful Medicines Offensive against Neoplasms in Hematology – HARMONY" (Project starting January 2017).
- Principal Investigator of the AIRC Investigator Grant 2016 "Beating aneuploid acute leukemia by integrated genomic, functional and preclinical studies".
- Partner and WP4 coordinator of the EraPerMed call 2018 project: SYNthetic Lethality for Personalized Therapy-based Stratification In Acute Leukemia.
  WP LEADER (2019) of H2020 project ONCORELIEF
  WP LEADER (2020) of Erapermed Project SYNTHERAPY

Education
1985 Graduation in Medicine, University of Verona Medical School, Verona, Italy
1988 Specialization in Hematology, University of Verona, Italy
1992 Specialization in Medical Genetics, University of Verona, Italy
1986 Registration medical register (Verona, Italy): n° 4900.
2001 Suitable to the role of **Associate University Professor**, scientific field disciplinary F07G – **Malattie del Sangue**, Facoltà di Medicina e Chirurgia dell'Università degli Studi di Milano.
2020 Phase 1 Clinical Trial Unit details: Part of IRST IRCCS organizational chart since 15/10/2020 with the role/Job/function of Phase 1 specialist physician;
Last updated pivotal training as specialist physician:
GCP 09/12/2020;
ALS 16/07/2020;
BLS 23/03/2021.
Skills
Communication skills: Excellent written and good communication skills developed during research experiences. Good teaching skills acquired during teaching, supplementary

teaching and student support. Excellent scientific communication skills.
Organisational / managerial skills: High organizational skills acquired during the research work. Remarkable ability to work in groups and to interface with professionals of different training, evidenced by the numerous active collaborations. Ability to manage research projects and collaborations with other national and international research groups. Ability to organize scientific meetings and international conferences.
Job-related skills & **Research interests:** his research and clinical activity involve the area of acute and chronic myeloid leukemia (AML and CML), acute lymphoblastic leukemia (ALL) and myelodisplastic syndromes (MDS). Expertise: Conduction of several Phase I-II-III clinical trials and biological research projects on AML, ALL, MDS and CML as Principal Investigator, with good knowledge of Good Clinical Practice. He has the skills, expertise and authority to lead a team and he has the capacity of using the resources in a flexible way, to achieve the project objectives
Publications
830 scientific articles, **2** patents, **34497** citations, **89** h-index (excluded self-citation, from Scopus 30.06.2021)

Göksel Leblebisatan
Pediatric Hematology, Çukurova University, Turkey

Göksel Leblebisatan, who completed his medical education in Hacettepe University, Faculty of Medicine at English division, completed his Pediatrics specialty education at Çukurova University Faculty of Medicine. He continues his academic life with the Pediatric Hematology residance program and completed his one-year military service in Samsun in March 2007. After his specialization as pediatric hematologist he completed his compulsory service at Gaziantep children's hospital. Then he come back to Adana Numune Training and Research Hospital as the chief assistant in 2011. Meanwhile, he won the title of associate professor and in 2013, he returned to Çukurova University Faculty of Medicine Pediatric hematology department with academic staff. who have been working in the same department since. Doctor Göksel, who also earned the title of professor during his academic studies, focused more on hemoglobinopathies and coagulation disorders in his scientific studies. Many publications in these fields are available in international and national indexes.

G. Nihal Özdemir
Pediatric Hematology Oncology,Istinye University&Liv hospital Ulus, Turkey

Dr Nihal Özdemir is currently a senior physician at Liv Hospital Ulus, Pediatric Hematology-Oncology department. She is also an Professor of Pediatrics at Istinye University Medical School. Dr Ozdemir graduated from Marmara University Medical School in 2000. She then completed her residency in pediatrics at the same university in 2005. Finally, Dr Ozdemir specialized in pediatric hematology undertaking a fellowship program at Cerrahpasa Faculty of Medicine in 2011. In 2012, Dr. Ozdemir visited Cincinnati Children's Hospital, USA and Great Ormond Street Hospital, London, UK as a clinical observer. The following year, Dr. Ozdemir was appointed as an associate professor at Cerrahpasa Faculty of Medicine. In 2014, she visited Oxford Hemophilia Center. She has worked as a pediatric hematology consultant at Kanuni Sultan Suleyman Reseach and Education Hospital in Istanbul until 2020. Her fields of interest are bleeding disorders, hemophilia and anemias.

Güray Saydam
Hematology,Ege University, Turkey

He has graduated from Hacettepe Medical School at 1993 and completed internal medicine residency by 1999. He started his hematology fellowship at 1999 and completed 2001.
During his fellowship, he had choosen leukemic signal transduction as research area; he worked mainly on intracellular cytoplasmic signal transduction systems in several cell lines as HL 60, K562 etc. He established the role of serine/threonine protein phosphatases in interferon induced apoptosis of chronic myeloid leukemia cells and published in Leukemia research. He worked with Dr. Serdar Bedii Omay and they published many paper on signal transduction system and leukomogenesis. He also was interested in new drug development for the treatment of acute and chronic leukemias, and worked on chalcones, established the antileukemic effect of these agents and published it. He followed many CML patients during this time. He published a case report related to the side effects of IFN in CML patient. He, also started to work on the role of phosphatases and the

potential interaction between phosphatases and bcr/abl in CML cells but, after 1 year working in Ege University Hospital as a hematology specialist, he was offered to move Memorial Sloan Kettering Cancer Center to work with Dr. Joseph R Bertino. Since Dr. Bertino moved to Cancer Institute of New Jersey (CINJ) at New Brunswick 08903, NJ, he moved to CINJ with Dr. Bertino. He worked in CINJ at 2003-2004. His research topics were mainly on new drug development for the treatment of leukemias. He worked on the mechanistic studies of Aplidin in leukemias. Bertino's lab has published this findings in Leukemia.
He moved back to Turkey at the second part of 2004. He started to work in Ege University Hospital, Dept. of Hematology and became Assoc. Prof. of Internal Medicine at 2005. He became full prof. of medicine at 2011 and he has been chair of Dept. of Hematology in Ege University Hospital since that time.
He has published more than 50 articles and case reports and reviews in international peer reviewed journals.
He worked as a secretary of Molecular and Cytogenetic Subcommittee of Turkish Hematology Association between 2005-2006. Then he became a chair of the same subcommittee at 2006,he will be in charge until 2010. He has been working o standardization of quantification of bcr/abl transcripts with PCR and trying to organize a nationwide network.
He has also some research project regarding the role of different agents and enzyme systems on the role of bcr/abl and its function.
He was elected as a chair of the CML/CMPD subcommittee by 2011and has been working on CML and nationwide projects. Recently, he has published a couple of reviews on CML in peer reviewed journals.
He and his colleagues have recently established a new associations with the name of EHOD (Ege Hematoloji Onkolji Derneği= Aegean Hematology Oncology Association) to improve the relationship between hematology and oncology fields not only national but also international platform.
His main interest areas are myeloma, CML and CMPDs.
Dr Saydam and his team has collected and published the results of IMID therapy in their patients with myeloma.
He has been occupying the chair position of Hematology Department in Ege University Hospital as well as the chief position of myeloma program of his unit since 2011.
He has published almost 150 articles, reviews and case reports in many peer-reviewed journals.

H. Emel Özyürek
Pediatric Hematology Oncology, Ankara Education and Research Hospital, Turkey

Dr. Emel Özyürek is head of the Pediatric hematology Oncology Clinic of Ankara Education and Research Hospital. She has been interested in thrombosis, hematological malignancies and hematopoetic stem cell transplantation in children. Her main interests in childhood thrombosis includes delivery of thrombolytics especially in catheter related thrombosis, anticoagulant therapy and thrombophilia.
She served as the member of Turkish Pediatric Society of Hematology- Subcommittee Leukemia, -Subcommittee Bone Marrow Failure. She has more than 70 international and national publications as well as more than 100 presentations at the international and national meetings.

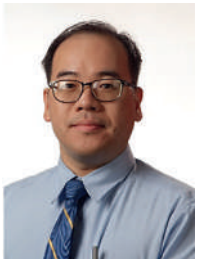
H. Neşe Yaralı
Pediatric Hematology & Oncology, Ankara City Hospital, Ankara Yildirim Beyazit University, Turkey

Dr. Neşe Yarali completed medical school at Ankara University Faculty of Medicine and her Pediatrics residency, and pediatric hematology fellowship at Dr. Sami Ulus Children's Hospital, Ankara. She worked as an observer on transfusion medicine at the Beth Israel Deaconess Medical Center, Harvard University School of Medicine. Prof. Yarali's interests include childhood leukemias, inherited and acquired bone marrow failures, anemias, and bleeding disorders. Prof Yarali is a member of various medical societies and in the board of the Turkish Society of Pediatric Hematology. She is currently working in Ankara City Hospital, Pediatric Hematology & Oncology Department, and Ankara Yildirim Beyazit University Department of Pediatrics.

Hale Ören
Pediatric Hematology, Dokuz Eylül University, Turkey

Hale Ören, MD, is a professor of pediatrics and a pediatric hematologist in the Dokuz Eylül University Faculty of Medicine, İzmir, Turkey. She is the head of the Department of Pediatric Hematology.
The main areas of Dr Ören's research are childhood leukemias, hemostasis, and thrombosis. She chaired the Turkish Pediatric Hematology Association and co-chaired the Turkish Society of Hematology, and still works in national leukemia and hemostasis/thrombosis subgroups.
Dr Ören has authored or co-authored more than 100 peer-reviewed papers in varied SCI/SCI-extended journals. She has written articles and has given lectures on the diagnosis, clinical and laboratory findings, follow-up, and management of leukemia, thrombosis, and bleeding disorders. She is a member of the editorial board for the Turkish Journal of Hematology.

Huy Pham
Hematology, Medical College of Wisconsin, USA



Dr. Pham is currently a Medical Director at the National Marrow Donor Program (also known as Be The Match) and an Adjunct Professor in the Department of Medicine at the Medical College of Wisconsin. Prior to his current positions, he was the Medical Director of Apheresis at the University of Alabama at Birmingham. He regularly attends clinical service and provides resident/fellow teaching in the Transfusion Medicine, Hemostasis, Apheresis, and Cellular Therapy. With research interests in statistics, mathematical modeling, and health economics in additional to the clinical aspects of the field, he has been the lead author or senior author for many original research and review articles as well as book chapters on different topics in Transfusion Medicine, Hemostasis, Apheresis, and Cellular Therapy. Nationally, he serves on multiple national organizations' Board of Directors and/or clinical and research committees and as a regular reviewer for many journals. He is also part of the American Society for Apheresis (ASFA) Special Issue committee that was responsible for making the 2019 and 2023 ASFA guidelines on the use of therapeutic apheresis. Dr. Pham is board certified in Clinical Pathology and Transfusion Medicine. Dr. Pham received his BS with honors in bioengineering from the University of California, Berkeley, MD from the Chicago Medical School, and MPH in Biostatistics from Columbia University. He completed his Clinical Pathology residency at the New York-Presbyterian Hospital – Columbia University Medical Center and Transfusion Medicine fellowship training at the joint program between New York Blood Center and Columbia University Medical Center.

İnci İlhan
Pediatric Hematology-Oncology, Ankara University, Turkey

- Hacettepe University Faculty of Medicine Pediatrics Specialization
- Minor in Hacettepe University Faculty of Medicine, Department of Pediatric Oncology
  - Specialization
- BMT application and Hematology in the Bone Marrow Transplantation Unit of Ankara University Faculty of Medicine İbn-i Sina Hospital Hematology-Oncology Department
  - In the laboratory of "tissue typing, immune typing, Elisa" note
  - education
- Trained in Pediatrics techniques in Ankara University Faculty of Medicine, Department of Pediatrics, Molecular Pathology laboratory.
- University of Texas MD Anderson Cancer Center Experimental Pediatrics
  - "Minimal residual in patients with leukemia in the laboratory with the PCR technique.
  - training on "expertise determination"
- SDU. Faculty of Medicine, Founding President of Pediatric Oncology Department
- Establishing a Pediatric Oncology department in the Pediatric Clinic of the MoH Ankara Training and Research Hospital
- MoH Ankara Oncology Hospital Pediatric Oncology Department Founding Chief
- Special student of Hacettepe University Biostatistics master's program
- Hacettepe University Tumor Biology and Immunology master's program special student
- Hacettepe University Gene Molecular Biology Master Ptogram special student

SCI. 60 original articles published in SCI-E e Turkish medical index

Jean-Francois Rossi
Hematology, Montpellier University, France

Jean-Francois Rossi is professor of Hematology at the university of Montpellier. He studied at the Faculty of Medicine in Montpellier with post-doc in Tuscon Az University and he was research fellow at the NIH and in San Antonio Tx. He is certified in Rhumatology, Immunology, Internal Medicine, Medical Oncology and Hematology. He was the head of the Hematology Department at the University Hospital of Montpellier for 18 years and now in the Institute of Cancer Avignon-Provence (Department of Biotherapies). He develops research in Precision Immune Therapy and Inflammatory/immune response with Inserm. He is consultant for different pharmaceutical companies and participated to 3 start-up companies in biology and cellular therapy. He has more than 200 publications and received a price from the AACR in 2017 for his work on inflammation and interleukin 6. He is member of different international scientific societies.

Jeffrey Lawrence Winters
Pathology, Mayo College of Medicine,USA

Dr. Jeffrey L. Winters graduated with high distinction from the University of Kentucky College of Medicine in Lexington Kentucky in 1993. His postgraduate training consisted of an Anatomic/Clinical Pathology residency at the University of Kentucky and a Transfusion Medicine/Blood Banking fellowship at the Mayo Clinic, Rochester Minnesota.

He is certified by the American Board of Pathology in Anatomic Pathology, Clinical Pathology, and Blood Banking/Transfusion Medicine.
Dr. Winters is Professor of Laboratory Medicine and Pathology in the Mayo College of Medicine and is the Associate Program Director of the Mayo Clinic Transfusion Medicine/Blood Banking Fellowship Program, Associate Program Director in charge of Clinical Pathology Curriculum for the Mayo Clinic Anatomic/Clinical Pathology Residency Program, and the Vice-chair of the Division of Transfusion Medicine. He is Medical Director of the Mayo Clinic Therapeutic Apheresis Treatment Unit, a fifteen-bed unit performing approximately 3,000 therapeutic apheresis procedures annually.
Dr. Winters is actively involved in the American Society for Apheresis (ASFA) and served as the president of ASFA. He has served on the committees responsible for the 2000, 2007, 2010, and 2013 therapeutic apheresis guidelines. He is the Editor-in-Chief of the *Journal of Clinical Apheresis*. He was an editor and author for *Apheresis: Principles and Practice* 3rd edition and *Therapeutic Apheresis: A Physician's Handbook* 2nd, 3rd, and 4th editions. He is the senior editor on *Apheresis: Principles and Practice* 4th edition which is currently in preparation. He has authored more than 150 peer reviewed publications 90 of which deal with apheresis.
He also currently serves on the Board of Directors for the AABB.

Katia Pagnano
Hematology, Campinas State University, Brazil

Katia Pagnano is a Hematologist and Researcher from Hematology and Hemotherapy Center at the University of Campinas (UNICAMP), Campinas-SP, Brazil, and Professor of Medicine at the Pontificia Universidade Católica de Campinas (PUC-Campinas), Campinas, SP, Brazil. She received her MD at the Faculty of Medicine-UNICAMP (1991) and completed residency and fellowship training in Hematology, Hemotherapy and Bone Marrow Transplantation at Hospital das Clinicas at UNICAMP (1992-1995). She did a split fellowship at the University of Pennsylvania (Philadelphia, USA) in Dr. Gewirtz's lab (1998). She received her Ph.D. in Internal Medicine at UNICAMP (2002). Dr. Pagnano's expertise is in treating patients with hematologic malignancies, in particular CML, myeloproliferative disorders (MPN), and AML. Dr. Pagnano has participated in Brazilian CML, AML, and MPN guidelines and in the CML Latin America Leukemia Net (LALNET) TFR recommendations. She is a member of the CML Committee from the Associação Brasileira de Hematologia, Hemoterapia e Terapia Celular (ABHH). She has participated in several CML clinical trials.

Kirsten K. Ness
Pediatric Hematology-Oncology,St. Jude Children's Research Hospital, USA

Kirsten K. Ness is a physical therapist and clinical epidemiologist and Member of the faculty at St. Jude Children's Research Hospital. She has a BA in Physical Therapy, an MA in Leadership and an MPH and PHD in Epidemiology. She is a Catherine Worthingham Fellow of the American Physical Therapy Association and has been in Physical Therapy practice for over 35 years. Her research focuses on the observation and remediation of functional loss among persons who were treated for cancer during childhood. She has funding from the American Cancer Society, the Gabrielle's Angel's Foundation, the National Cancer Institute, and the National Institute of Child Health and Human Development. She has over 300 peer reviewed publications and serves on the Steering Committees for the Childhood Cancer Survivor Study and the Children's Oncology Group Survivorship and Outcomes Committee. She serves as MPI & Co-chair of the Global Outcomes Working Group for the St. Jude Lifetime Cohort Study. She is an active member of the Oncology Section of the American Physical Therapy Association, and on the Editorial Boards of Pediatric Physical Therapy, Pediatric Blood and Cancer, Physical Therapy, and Journal of Cancer Survivorship.

Marcela Ganzella Sisdelli
Hematology, Blood Center of Ribeirão Preto, Brazil

I have been working at the Blood Center of Ribeirão Preto since March 2009. The Blood Center of Ribeirão Preto is one of the most important hemotherapy and hematology centers in Brazil. It was created in 1990 to act as a national reference in care, teaching and research. The quality of the services offered has been attested by the Vanzolini Foundation since 1999 and the American Association of Blood Banks since 2003. In the blood bank I provide care to patients with hemoglobinopathies, oncohematology and with bleeding disorders, besides attending blood donors. I lead the team of nurses like a manager nurse. I have a Master and PhD degree in Sciences by the University of São Paulo. I also have Technical Proficiency in Hematology and Hemotherapy. Apart from health assistance, I participate in research projects to the benefit of patients.

Margareth C. Ozelo
Haematology, University of Campinas, Brazil

Dr Margareth C. Ozelo is Associate Professor of Internal Medicine Department, and Director of the Haematology Division from University of Campinas (UNICAMP) in Campinas, São Paulo, Brazil. She received her medical degree (1994), specialist training in haematology and transfusion medicine (1994-1997), and PhD (2004) at UNICAMP before undertaking a postdoctoral fellowship in David Lillicrap's laboratory, at Queen's University in Kingston, Ontario, Canada, focused in gene therapy for haemophilia (2006–2009).
She is also Director of the WFH International Haemophilia Training Centre (IHTC) from Hemocentro UNICAMP. Dr Ozelo is involved with several research projects, including, gene therapy for haemophilia, risk factors for inhibitor development, immune tolerance induction, and the management of musculoskeletal complications of haemophilia, and inherited platelet disorders.

María-Victoria Mateos
Haematology, University of Salamanca, Spain

Dr. María-Victoria Mateos is Consultant Physician in the Haematology Department and Associate Professor of Medicine at the University of Salamanca, Spain. She is the director of the Myeloma Program and coordinates the Clinical Trials Unit.
She serves as coordinator of Spanish Myeloma Group, with direct involvement in the design and development of clinical trials and some of them have profoundly influenced current options for the management of these patient populations.
She has published over 300 papers with a H index of 79.
She has served on the ASH Scientific Committee on plasma cell diseases and on the EHA's Scientific Program Committee between 2013-20, being chair of the Scientific Program Committee in 2019.
She has been Councillor on the EHA Board between 2015-19 and she remains as member of the IMS executive board and member of the European School of Haematology (ESH) Scientific committee. She received the Briand Durie Award in 2019 recognizing excellence in myeloma research.

Marie Waller
Haematology, Manchester Metropolitan University, UK

Marie is an Advanced Nurse Practitioner (ANP) in haematology mainly working in haemato-oncology and stem cell transplantation. She has worked in haematology and transplant since qualifying as a nurse in Aberdeen in 2000. She subsequently worked at the Christie Hospital Manchester before moving to Manchester Royal Infirmary as a transplant coordinator in 2006. Marie studied an MSc in advanced practice and qualified as an ANP in 2015. She holds the additional role as honorary senior clinical lecturer on the advanced clinical practitioner course at Manchester Metropolitan University.
Marie is currently chair of the UK EBMT nurses and AHP group and BMT Nurse Representative for BSBMT-CT executive committee. She is also an expert advisor to NICE following involvement in the NICE haematology improving outcomes published in 2016. She has presented locally, nationally and at internationally at various conferences and she is published in a nursing textbook.

Massimo Federico
Medical Oncology, University of Modena and Reggio Emilia, Italy

Professor Federico is Senior Professor of Medical Oncology at the University of Modena and Reggio Emilia, Modena, Italy, and Director of Medical Oncology Unit at Città di Lecce Hospital, GVM, Care and Research. He is the Founder of the Modena Cancer Center. Formerly, Professor Federico was the president of Gruppo Italiano Studio Linfomi (GISL), thereafter of Fondazione Italiana Linfomi (FIL) of the Lymphoma-hub, and AIBE (Associazione Italo Brasiliana di Ematologia). Professor Federico has designed and conducted several phase II and III clinical trials in different subtypes of Hodgkin and non Hodgkin's lymphoma. Moreover, he widely investigated the role of prognostic factors in different lymphomas, including Hodgkin, Follicular, and Peripheral T Cell Lymphomas. He is currently leading the International T Cell Project. He is the author or co-author of more than 450 peer-reviewed publications.

Bibliometrics:

- ***H INDEX*** (Scopus) **75**
- ***H INDEX*** (Researchgate) **71**
- **Citations** (Scopus) **21,658**
- **Citations** (ResearchGate) **27,212**
- **Research Gate Score 51.64** (higher than 97.5% of all ResearchGate members' scores)

Medine Ç. Yılmaz
Nursing Department, Izmir Katip Çelebi University, Turkey

Professor Medine Yilmaz completed her Bachelor of Science (B.S.) and Master of Science (M.S) in Nursing, İstanbul University Florence Nightingale Nursing School, Istanbul, Turkey. In 2006, she received her Ph.D. in department of Public Health Nursing, Ege University. She worked a head nurse at the Pediatric Oncology and Stem Cell Transplantation Unit, Ege University Medical Faculty Hospital, Izmir. She has been worked in Izmir Katip Çelebi University, Faculty of Health Sciences, Nursing Department as an academician nurse since October 2011. And she has continued to work at the same University Public Health Nursing Department as lecturer. Prof.Yilmaz has published articles on pediatric oncology nursing, stem cell transplantation, and public health nursing in Turkish and English. Her research interests are symptom management, oral care, child health, nursing education.

Mehmet Ertem
Pediatric Hematology and Oncology, Ankara University, Turkey

MEDICAL SCHOOL Ege University School of Medicine, Izmir, 1979-1985
COMPULSORY SERVİCE General Practitioner, Samsun 1985-1987
RESIDENCY TRAINING Pediatrics (1887-1991)
Behçet Uz Children Hospital, İzmir, 1987-1988
Zeynep Kamil Children Hospital, İstanbul, 1988-1991
SUBSPECIALTY TRAINING Pediatric Hematology/Oncology TRAINING Yale University School of Medicine, New Haven, U.S.A.
August 1991-July 1995
ACADEMIC POSITIONS Ankara University School of Medicine Division of Pediatric Hematology and Oncology
Assistant Professor, November 1995-November 2000
Associate Professor, November 2000-August 2006
Professor, August 2006- to date
ADMINISTRATIVE POSITIONS Director of Pediatric BMT Unit, 2004- to date
Deputy Chief Physician of Ankara University Cebeci Hospital, 2014 – 2020

Mehmet Fatih Erbey
Pediatric Hematology-Oncology, Koç University, Turkey

He was born in Gaziantep in 1976. He graduated from Çukurova University Faculty of Medicine in 1999. He completed his pediatric residency training in 2005 and pediatric oncology training in 2009 in Çukurova University Faculty of Medicine. In 2007, he was an observer doctor at the Pediatric Bone Marrow Transplantation Unit of the Children's Hospital of Pittsburgh, USA. Between 2009-2010, he fulfilled his public service obligation at Van Maternity and Children's Hospital. In 2011, he worked as a faculty member at Ege University Faculty of Medicine, Pediatric Oncology and Bone Marrow Transplantation Unit. He worked at Medicalpark Bahçelievler Hospital between 2011-2014, and at Acıbadem University Faculty of Medicine, Atakent Hospital between 2014-2018 in Pediatric Hematology/Oncology and Pediatric Bone Marrow Transplantation units. He received the title of associate professor in 2013. He has been working as a faculty member at Koç University Faculty of Medicine since March 2019.

Mehmet Fatih Okçu
Pediatric Hematology-Oncology, *Texas Children's Hospital, USA*

School	Education	Degree	Year
University of Texas Medical School at Houston	Other	Master of Public Health	2000
University of Texas MD Anderson Cancer Center	Fellowship	Pediatric Hematology Oncology	1999
University of Texas Medical School at Houston	Residency	Pediatrics	1995
University of Texas Medical School at Houston	Internship	Pediatrics	1993
Istanbul University-Turkey	Medical School	Doctor of Medicine	1989

About
Dr. Fatih Okcu's longstanding clinical interest and expertise is in brain tumors and solid tumors. He treats all subtypes of brain tumors, and has a special interest in soft tissue sarcomas, Ewing sarcoma, malignant melanoma and rare pediatric cancers. Dr. Fatih Okcu is a member of the Childhood Cancer Epidemiology and Prevention Program, the Solid Tumor Programs, the Long Term Survivor Program, and the Brain Tumor Program.

Organization

Organization Name	Role
Children's Oncology Group (COG)	Member
Society for Neuro-Oncology (SNO)	Member

Research Statement
Dr. Fatih Okcu has ongoing studies include late effects after proton radiation therapy in brain tumor patients, reasons for lack of adherence to follow up care in survivors and relationship between genetic polymorphisms and late permanent treatment effects in childhood cancer survivors.

Research Interests Molecular cancer epidemiology Genetic polymorphisms that modify therapy modalities Adverse events secondary to treatment Neurocognitive impairments in childhood long-term survivors

Selected Publications

View publications on PubMed

View publications on VIICTR

Language

English, Turkish

* Texas Children's Hospital physicians' licenses and credentials are reviewed prior to practicing at any of our facilities. Sections titled From the Doctor, Professional Organizations and Publications were provided by the physician's office and were not verified by Texas Children's Hospita

Mehmet Sönmez

Hematology, Karadeniz Technical University, Turkey

He graduated from İstanbul University Cerrahpaşa Faculty of Medicine in 1988. He completed his Internal Medicine and Hematology in Karadeniz Technical University Faculty of Medicine. He has a great number of nationally and internationally published works, papers, book chapters and editorial works. He is also a member of various national and international institutions and organizations. He has been working as an academician responsible for the bone marrow transplant unit, tissue typing laboratory, apheresis unit, flowcytometry and hemostasis laboratories at Karadeniz Technical University Faculty of Medicine since 2009 and still holds his position as the president of the Hematology Department.

Mehmet Yılmaz

Hematology, SANKO University, Turkey

Mehmet Yilmaz, MD is a Professor of Internal Medicine Department of Hematology in SANKO University School of Medicine, Gaziantep. He was graduated from Cukurova University School of Medicine. Post graduate training; Internal Medicine and Hematology 1995-2002 Ankara Numune Education and Research Hospital, Immunohematology, Therapeutic Apheresis and blood transfusion as observer Leiden Medical Center 2007, Therapeutic Apheresis and Clinical Education of Blood and Bone Marrow Transplantation 2008, Erciyes University Department of Hematology Bone Marrow transplant and Therapeutic Apheresis Center, Kayseri. He founded hematology discipline at 2004, therapeutic apheresis center 2010 as a chief and bone marrow transplant as vice-chairman in Gaziantep University School of Medicine at 2009. He also founded hematology discipline and therapeutic apheresis center as a chief at SANKO University School of Medicine at 2018. His main research interest is hematologic malignancies and therapeutic apheresis. In clinical research era Dr. Yilmaz participated some important clinical trials (deferasirox, Rituximab, The World CML Registry, Bosutinib, SC Rutiximab, Obinituzumab) on the fields hematologic malignancies. Dr. Yilmaz has written over the 200 publications, abstracts and other scientific presentations. Throughout his career had received numerous national abstract awards. Dr. Yilmaz is member of several professional, national and international scientific societies including EHA, EHOC, Turkish Society of Hematology, Experimental Hematology and Turkish Society of Apheresis.

Melissa M. Hudson

Oncology, St. Jude Children's Research Hospital, USA

Melissa M. Hudson, MD, joined the St. Jude Children's Research Hospital faculty in 1989 after completing her fellowship in Pediatric Hematology-Oncology at the University of Texas, M.D. Anderson Cancer Center. She is currently a Member and Director of the Cancer Survivorship Division in the Department of Oncology and holds the Charles E. Williams Endowed Chair of Oncology-Cancer Survivorship. In 1993, Dr. Hudson became the Director of the After Completion of Therapy (ACT) Program, which now monitors over 8000 long-term childhood cancer survivors treated on St. Jude trials. During her tenure as Director, the ACT Program evaluation evolved to include a series of focused educational interventions aiming to increase survivor knowledge about cancer and its associated health risks and motivate the practice of health protective behaviors. The ACT Program has served as a paradigm of optimal risk-based survivor care, within a research setting, that provides a screening and prevention plan that integrates the cancer experience with health care needs. The ACT Program has also provided a forum for numerous research initiatives evaluating complications after childhood cancer and methods of health promotion.

Dr. Hudson disseminated the St. Jude model of risk-based survivor care in her role as Co-Chair of the Children's Oncology Group (COG) Long-Term Follow-Up Guidelines for Survivors of Childhood, Adolescent and Young Adult Cancer and Co-Chair of the International Late Effects of Childhood Cancer Guideline Harmonization Group (IGHG). She is also the Chair of the Education Committee of the Childhood Cancer Survivor Study (CCSS) and a member of the CCSS Executive Committee. She works collaboratively with multidisciplinary investigators at St. Jude and within COG, IGHG and the CCSS in research initiatives evaluating biomedical and psychosocial outcomes among childhood cancer survivors and translating data from health outcomes research into evidence-informed clinical practice guidelines and interventions to improve the quality and duration of survival after childhood cancer. She has published over 500 peer-reviewed articles featuring results of her research initiatives in pediatric Hodgkin

lymphoma, late treatment sequelae after childhood cancer, and health surveillance of childhood cancer survivors.
Dr. Hudson has an extensive record of editorial service as Pediatric Section Editor of *Cancer* (2000 - 2010), Pediatric Associate Editor of the *Journal of Clinical Oncology* (2011 - 2021), Section Editor of the *NCI Physician Data Query* (2010 – present), and Section Editor of *Pediatric Blood and Cancer* (2007 – present). She has also held multiple positions within the American Society of Clinical Oncology, including chair of the Cancer Survivorship Committee. She currently chairs the North American Symposium on Complications after Childhood Cancer Program Committee and has served on program planning committees for numerous professional organizations (American Society of Clinical Oncology, International Society of Paediatric Oncology, International Symposium on Childhood, Adolescent and Young Adult Hodgkin Lymphoma, American Association for Cancer Research American Institute of Cancer Research).
Dr. Hudson's accomplishments have been recognized by election to the American Association of Physicians and selection as a Fellow of the American Society of Clinical Oncology. Her collaborative contributions in survivorship research were acknowledged by the American Association Team Science Award in 2009 and 2019. In 2020, she received the American Society of Pediatric Hematology Oncology and Northwestern Mutual Award for Excellence in Childhood Cancer Survivorship.

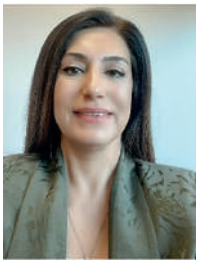
Moshe Mittelman
Hematology,Tel Aviv Sourasky Medical Center, and Sackler Faculty of Medicine, Tel Aviv University, Israel

Professor Mittelman graduated from the Sackler School of Medicine in 1976, and served in the Israel Medical Corps (IDF), before completing a Residency in Internal Medicine at the Hasharon Hospital, Petah-Tikva, Israel. He later undertook a Combined Clinical and Research Fellowship Programme in Hematology and Oncology at the George Washington University Medical Center, Washington DC, USA, and The National Institutes of Health (NIH), Bethseda, USA. Professor Mittelman returned to Israel in 1989 and has since held several posts at the Hasharon Hospital and Tel Aviv Sourasky Medical Center. Moshe has also served as President of the Israel Society of Internal Medicine, Secretary of the Israel Society of Hematology, a Hematology Consultant for the Israel Ministry of Health, and is currently the President of the Israel Society of Hematology and Transfusion Medicine. Among other academic and public duties, Prof Mittelman served as a member of the National Health Basket (Vaadat Sal) committee, and as a member of the Israel Medical Association (HARI) Scientific Committee. As a chairman of the Student Admission Committee of the Tel Aviv University Sackler School of Medicine, Dr Mittelman led the novel admission program, combining scholastic scores with personality and behaviour as evaluated parameters for medical school candidates. He has also served as a member of the National Council for the Prevention and Treatment of Cancer; a member of the Board of Directors of the Israel Medical Association (Haaguda) and as a consultant for biotechnology firms. As a biotech expert he is responsible for 2 patents, leading to start-up companies. He is currently the chief scientific officer of a biotech fund. Professor Mittelman's research interests include basic and clinical aspects of multiple myeloma, stem cell disorders such as myelodysplastic syndromes (MDS) and myeloproliferative neoplasms (MPN) and basic and clinical effects of erythropoietin. He has co-authored more than 200 publications, including textbook chapters and articles, published in journals such as Blood, Journal of Clinical Oncology, Proceedings of the National Academy of Sciences, Haematologica, British Journal of Haematology and Experimental Hematology. Later this year, Dr Mittelman will complete his term as Chairman, Department of Medicine, at the Tel Aviv Sourasky Medical Center, and will continue to serve as a hematology consultant, in addition to his post as a full clinical professor affiliated with the Sackler School of Medicine, Tel Aviv University.

Murat Sönmezer
Obstetrics and Gynecology, Ankara University, Turkey

Murat Sönmezer is a Professor at the Ankara University School of Medicine Department of Obstetrics and Gynecology. He completed his medical training in Hacettepe University Medical Faculty in 1994 and residency training in Ankara University Faculty of Medicine Department of Obstetrics and Gynecology in 2000. He completed a postdoctoral fellowship program and worked in Dr Kutluk Oktay's laboratory in Weill Medical College of Cornell University, Center of Reproductive Medicine and Infertility in New York in 2003. Dr. Sönmezer has published more than 100 articles in peer reviewed international journals, and coauthored in various respected international textbooks. He was invited for many lectures worldwide. He is a current member of the executive committee of the Society of Reproductive Medicine and Reproductive Surgery. Among the area of his special interests are ART, reproductive surgery and fertility preservation.
He has been working as an attending physician at the Center for Human Reproduction and Infertility of the Ankara University Faculty of Medicine since 2006, and running a special program on fertility preservation techniques including ovarian tissue cryopreservation in cancer patients. He performed the first ovarian tissue cryopreservation procedure, transplantation and pregnancy from frozen thawed ovarian tissue in a patient with leukemia. He also defined random start controlled ovarian hyperstimulation for fertility preservation in emergent conditions with Kutluk Oktay, and abdominal ultrasound guided oocyte retrieval using transabdominal probe for the purpose of fertility preservation. Currently he is conducting a project on the effectiveness of autologous hematopoietic stem cell transplantation in patients with poor ovarian reserve.

Müzeyyen Aslaner
Hematology, Zonguldak Bülent Ecevit University, Turkey



I was born in Van Ercis in 1977, completed my primary, secondary and high school education in İzmir. I graduated from Faculty of Medicine at Dokuz Eylul University in 2000 and worked as a general practitioner between 2000 and 2004. I completed my Internal Medicine Specialty at Istanbul Training and Research Hospital between 2004 and 2009. Also completed my Hematology Subspecialty in the Department of Hematology in Faculty of Medicine at Zonguldak Bülent Ecevit University between 2013 and 2016. I worked at the Bone Marrow Transplantation Unit of the Department of Hematology in Faculty of Medicine at Ege University, between 2018 and 2019. Since December 2019 I have been working as a faculty member at Department of Hematology in Faculty of Medicine at Zonguldak Bülent Ecevit University.

Naeem Arshad Chaudhri
Consultant Hematologist, Oncology Centre King Faisal Specialist Hospital & Research Centre Oncology Centre, Saudi Arabia

PRESENT ACADEMIC RANK AND POSITION
Dec 1995 - Present **Consultant**
Adult Hematology/Hematopoietic Stem Cell Transplantation Oncology Centre
King Faisal Specialist Hospital and Research Center, Riyadh, Saudi Arabia
Dec 2004 – Present **Director, Research Unit (Section Head)**
Oncology Centre King Faisal Specialist Hospital and Research Center, Riyadh, Saudi Arabia
Aug 2010 – Present **Associate Professor**
Alfaisal University, College of Medicine, Riyadh, Saudi Arabia
Clerkship Director
IMD 591 (Hem/Onc), Oncology Centre Clerkship for Alfaisal University Medical Students
Mar 2010 – Present **Associate Editor-In-Chief**
Annals of Saudi Medicine, King Faisal Specialist Hospital and Research Center, Riyadh, Saudi Arabia

UNDERGRADUATE AND GRADUATE EDUCATION
1983 **MBBS/MD**
Allama Iqbal Medical College/University of Punjab, Lahore, Pakistan

POSTGRADUATE EDUCATION AND TRAINING
USA
1986/87 **MD** (ECFMG Certificate)
1989 **MD** (Federal Licensure Exam)
1989-1992 **Residency (Internal Medicine)**
Lutheran Medical Center, Fairview General Hospital, Cleveland, Ohio, USA
1992-1995 **Fellowship (Hematology and Oncology)**
Lombardi Cancer Center, Georgetown University Hospital, Washington DC, USA
Pakistan Internal Medicine
1984-1988 (Internship, House Officer and Medical Officer)

BOARD CERTIFICATION CERTIFIED RECERTIFIED
American Board of Internal Medicine
Internal Medicine:9/1993 *5/2005
Hematology: 9/1996 *5/2005
Oncology: 9/1997 *5/2005 (Last Component)
*Enrolled in Maintenance of Certification (MOC)

MEDICAL LICENSURE
Virginia. License number: 0101048903 (Active)
Washington DC. License number: MD000019875 (Inactive)

HONORS AND AWARDS
CHIEF RESIDENT: Internal Medicine 1991-1992
Lutheran Medical Center, Fairview General Hospital, Cleveland, Ohio, USA
CHIEF FELLOW: Medical Oncology 1993-1994
Georgetown University Hospital, Washington DC, USA
FACP: Fellow American College of Physicians (FACP)

PREVIOUS PROFESSIONAL POSITIIONS AND APPOINTMENTS
Dec 2004 – Present **Director, Research Unit (Section Head)**
Oncology Centre, King Faisal Specialist Hospital and Research Center, Riyadh, Saudi Arabia

CLINICAL/ACADEMIC RESEARCH
Aug 2011 –**hairman, Clinical Research Committee**
Oncology Centre,
2010-Present **Associate Editor-in-Chief**
Annals of Saudi Medicine, King Faisal Specialist Hospital and Research Center, Riyadh, Saudi Arabia
May 2001 – Dec 2004 **Director, Adult Leukemia Service**
King Faisal Cancer Centre (presently Oncology Centre)
King Faisal Specialist Hospital and Research Center, Riyadh, Saudi Arabia
1996 – 1999 **Chairman, Oncology Research Committee**
King Faisal Cancer Centre (presently Oncology Centre)
King Faisal Specialist Hospital and Research Center, Riyadh, Saudi Arabia
Feb 2003 – Feb 2005 **Member, Basic Research Committee**
Research Advisory Council, King Faisal Specialist Hospital and Research Center, Riyadh, Saudi Arabia

EDUCATION-TEACHING
Postgraduate Adult Hematology Fellowship Training Program and
1996-Present **SCT Fellowship Training Program**
Oncology Centre, King Faisal Specialist Hospital and Research Center, Riyadh, Saudi Arabia
Undergraduate Associate Professor
Aug 2010-Present College of Medicine, Alfaisal University
Clerkship Director (IMD 591/HemOnc)
College of Medicine, Alfaisal University

- Program development
- Development of teaching program

- PBL, OSCE preparation
- Mentoring and evaluation of students

Undergraduate Chief Resident and Chief Fellow and Postgraduate
1989-1992 Lutheran Medical Center, Fairview General Hospital Cleveland, Ohio, USA
1989-1995 Georgetown University Medical School, Washington DC, USA
1984-1987 Resident/Medical Officer
Teaching for medical students at Rawalpindi Medical College, Rawalpindi, Pakistan and Allama Iqbal Medical College, Lahore, Pakistan

EDUCATION-JOURNALS
Associate Editor-in-Chief Annals of Saudi Medicine
Advisory Board Journal of Applied Hematology
The Official Journal of Saudi Society of Hematology
Scientific Reviewer

1) Annals of Saudi Medicine
2) Saudi Medical Journal
3) Numerous journals on request

RESEARCH AND PUBLICATIONS
Head, Research Unit
Principal Investigator of SouthWest Oncology Group (SWOG)
In-charge for databases for Leukemia
Numerous local and international funded grants as Principal Investigator
Numerous publications in peer-reviewed journals

Syed Najeeb Niamatullah
Hematology-Oncology, Shaukat Khanum Memorial Cancer Hospital & Research Center, Pakistan

M.B., B.S from Dow Medical College, Karachi, Pakistan (1989)
Residency and fellowship from St. Luke's/Roosevelt Hospital Center, New York, NY (1992-1998)
Diplomate American Board of Internal Medicine, Medical Oncology and Hematology.
Currently working as Consultant Hematologist and Oncologist at Sindh Institute of Urology and Transplantation and Shaukat Khanum Memorial Cancer Hospital & Research Center.
Secratary, Faculty of Medical Oncology, College of Physicians & Surgeons, Pakistan.
Treasurer and Founding Member, Society of Medical Oncology, Pakistan.

Natalia Mikhailova
Hematology, Pavlov University, Russia

Natalia Mikhailova, MD, PhD, graduated from the First Leningrad Medical Institute in 1979. Then she studied in clinical residency in internal medicine and later completed residency at the Petrov Research Institute of Oncology in Leningrad. All professional activities were associated with the study and treatment of lymphoproliferative diseases. Under the guidance of Professor Boris Afanasyev, she was engaged in bone marrow transplantation, first at the Research Institute of Oncology, then at the St. Petersburg Pavlov State Medical University. Currently, she is Head of the Department of Clinical Oncology at R. Gorbacheva memorial Research Institute for Pediatric Oncology, Hematology and Transplantation, and is an Associate Professor of the Faculty of Hematology, Transfusiology and Transplantation at Pavlov University. The author of more than 100 publications.

Nazan Sarper
Pediatric Hematology, Kocaeli University, Turkey

Research Interests
My research interests are in the field of pediatric leukemia, coagulation disorders and hemophagocytosis. Principal investigator in the international multicenter phase III studies in hemophilia.

Education
1971-1978 Kadıköy Anatolian High School (Maarif College)
1978-1984 İstanbul University, İstanbul Medical School
1987- 1991 İstanbul Zeynep Kamil Children and Obstetric Education and Research Hospital-Pediatric residency.
1994-1998 İstanbul University, İstanbul Medical Faculty, Pediatric Hematology-Oncology and Hematopoietic Transplantation Unit, hematology fellowship.

Academic And Proffessional Positions
Since Nov 1999- Academic and Professional Positions Kocaeli University, Medical Faculty, Founder of Pediatric Hematology-Oncology and HSCT Unit
1998-Nov 1999 İstanbul Zeynep Kamil Children and Obstetrics Education and Research Hospital, Pediatric Hematologist
Dec 1984-March 1987 Kütahya first stage outpatient clinic of Ministry of Education, compulsory service as a physician.

Teaching Experience
Nov 1999-2021 Undergraduate, Pediatric and Hematology Fellowship. Kocaeli University, Medical Faculty,
Nov 2016-2019 Director of Department of Pediatrics
Mentor of pediatric hematologists Emine Zengin, Suar Çakı Kılıç, Sema Aylan Gelen, Uğur Demirsoy, Meriban Karadoğan and Mehmet Azizoğlu (pediatric hematologists and oncologists) and many pediatry fellows.

Service To Professional Journals
reviewer
Journal of Pediatric Hematology Oncology
Pediatric Hematology and Oncology
Turkish Journal of Hematology

Publications
She has 85 publications and 620 citations in Medical Journals indexed in Web of Science (H-index 13); also has publications in National Medical Journals. She wrote nine book chapters (two international).
She is the founder of Kocaeli Hemophilia Association. She is married, has one son. She has good command of English.

Nejat Akar
Pediatrics Department, TOBB-ETU Medical School, Turkey

Prof. Dr. Nejat Akar was born in Ankara in 1952. After he completed his education in TED Ankara College, he graduated from the Medical Faculty of Ankara University in 1977. He became a professor in 1995 . He has conducted research in Italy and the USA in molecular genetics.
He was awarded the Turkish Scientific and Research Council Research Award in 1989 and the Ankara University Research Award in 2000.
He worked as a member of the Department of the Pediatric Molecular Genetics in the Department of Childhood Health and Diseases of the Ankara University Medical Faculty.
He was also the Founding Director of the Biotechnology Institute of Ankara University.
He is now working as a faculty member of TOBB-ETU Medical School, Pediatrics Department.
He is a member of the editorial board of the several journals including Thrombosis Research, Egyptian Journal of Medical Human Genetics, Turkish Journal of Hematology.
He published a textbook titled "Introduction to Clinical Molecular Pathology (1995 & 1998)" and also "Genome Project and The Turkish Press (2007)".
He published the following books in English:: "15 years of Anatolia with Ord. Prof. Dr. Albert Eckstein, 1935-1950 (2017) ", "A Humane Mission: Dumlupınar (2017) and "Mother and Child Sculpture" (2005). A TV documentary based on his book "A Female Surgeon in Iğdır (2005)" was created. His other books are in Turkish: Turkey in the 1939 New York World Fair (2005), Biography of A Pediatrician: Bahtiyar Demirağ (2005), Portraits in My Pocket (2011). The First World War and Children, 2014, Occupation of İstanbul (2020), Children in Zülfü Livaneli's Novels (2021).
He is married to Ece Akar and father to two children and two grandson.

Nikolai N.Tupitsyn
Clinical Immunology, N.N.Blokhin Russian Cancer Research Center, Russia

Date of birth 06.06.1954
1978 Graduated with honor Moscow Medical Institution - MD
1978 - 1981 Postgraduate Cancer Research Center, Moscow. 1982 PhD Title: "Peculiarities of Ig-molecules assembly in children lymphoproliferative disorders"
1992 - Doctor of Sciences (Medicine), Title: "Immunophenotypic characterization of human haemoblastoses".
1999 - Professor of oncology (clinical tumor immunology).
Since 1978 till now (2017) works in Federal State Budgetary Institute "Russian Cancer Research Center named after N.N. Blokhin" Ministry of Health of Russian Federation - Laboratory of Clinical Immunology: Researcher, Senior Researcher, Leading Researcher. Since April 2003 - Head of Laboratory of Haematopoiesis Immunology in the same Institute. Since 2009 – Honored Scientist of Russia
Main area of interests - clinical tumor immunology, particularly immunodiagnosis of haemoblastoses and tumors, CTC/DTC, local tumor immunity, immunological tumor staging, haematopoietic stem cells, Il-6 signaling and gp130 activation.
Author of more than 350 articles and 4, several chapters in textbooks. Supervisor of 49 PhD and 8 doctoral dissertations. Collaborated with France, UK, Germany; many times participated at International Conferences and Congresses.
Since 2003 Chairman of Annual International Conference "Haematopoiesis Immunology"
Since 2003 Editor-in-Chief "Haematopoiesis Immunology" – Journal published in English and in Russian, ISSN 1818-4820 /English editor - G.Janossy (London)

Nilgün Kurucu
Pediatric Oncology, Hacettepe University, Turkey

She graduated from Hacettepe University Faculty of Medicine in 1987. She worked as an assistant pediatrician in Department of Pediatrics in Hacettepe University Faculty of Medicine between 1988 and 1992. She started the pediatric oncology fellowship program in Pediatric Oncology Department of Hacettepe University Faculty of Medicine in 1995 and finished in 1998. In August 1999, she was appointed to

the staff of Assistant Professor in the Karadeniz Technical University Faculty of Medicine Department of Pediatrics. She was appointed as the Head of Pediatric Oncology Department in November 2000. She became Associate Professor of Child Health and Diseases in 2002 and as Professor in 2007.
She worked in Ankara Oncology Research and Training Hospital, between 2009 and 2014. She has been working in Hacettepe University Department of Pediatric Oncology since 2014. She is a member of Association of Turkish Pediatric Oncology Group, American Society of Clinical Oncology (ASCO) and International Society of Pediatric Oncology (SIOP) and also the head of Scientific Committee of Association of Turkish Pediatric Oncology Group.

Nur Olgun
Pediatric Oncology, Dokuz Eylül University, Turkey

Dr. Nur Olgun, who is still working as Dokuz Eylül University Oncology Institute Pediatric Oncology Department Head and Oncology Institute, has been teaching Pediatric Oncology since 1987. In 1992, Izmir Pediatric Oncology Group Neuroblastoma coordinator and protocol and the exam was renewed in 2003 and 2009 and nationally. can continue with accepted neuroblastoma protocols. Nur Olgun, the coordinator of the Turkish Pediatric Oncology Group Neuroblastoma Protocol 2003 and 2009 (TPOG-NB-2003 and 2009), was renewed in 2020 and the TPOG-NB-2020 protocol was considered. Currently, TPOG-NB-2020 protocol coordinator Dr. Mature, training in the field of education. Continuing basic translational oncology research based on neuroblastoma or related autoation.

Ofir Wolach
Hematology, Davidoff Cancer Center, Israel

Ofir Wolach earned his MD at Tel-AVIV University. He completed Internal Medicine residency and Hematology fellowship at Rabin Medical Center, Petah-Tikva, Israel.
Following his interest in myeloid diseases, Dr. Wolach trained at Dana-Farber Cancer Institute in Boston in the field of leukemia. MDS, MPNs and related myeloid malignancies under the mentorship of Dr. Richard Stone.
Dr. Wolach has specific interest in the genomics of myeloid malignancies and studied the effects of clonal hematopoiesis of disease phenotype and immune functions as a post-doc in the Ebert lab at Brigham and Woman's Hospital in Boston.
Currently Dr. Wolach heads the Hemato-oncology admission unit at the Davidoff Cancer Center at Rabin Medical Center near Tel Aviv.

Orhan Ayyıldız
Hematology, Dicle University, Turkey

Dr.Orhan Ayyildiz was born in Midyat city in 1968. He was graduated in Istanbul Cerrahpasa Medical faculty in 1990 and in 1994 he was accepted internal medicine speciality degree in Dicle Medical Faculty. His academic studies started at 1994 in Dicle Medical Faculty Department of Hematology. In 1998 his academic degree was Associated professor. In those years he was focusing about Clinical hematology, blood banking-apheresis and laboratory hematology. He and his collegues studies support many clinical and laboratory issue for Turkish Hematology. He reached to academic degree of Professor in 2004. He was studied with famous Turkish Scientist. Dr.Ayyildiz wrote many article (more then one hundred) in Turkish and English literature. He also wrote and edit many books chapter about internal medicine and hematology. He was teached more than thousand of medicine students and residents. He is now head of Internal medicine and hematology in Dicle University Medical Faculty, in Diyarbakir/Turkey.

Özlem Tüfekçi
Pediatric Hematology, Dokuz Eylul University, Turkey

Dr. Özlem Tüfekçi was born in Rize in 1978. She graduated from Trabzon Yomra Science High School and obtained her medical degree at Marmara University in İstanbul. Her residency in pediatrics was at Dokuz Eylül University Hospital and she also completed her fellowship in pediatric hematology at the same university. During her fellowship she worked as an observer in Bone Marrow Transplantation Unit of Great Ormond Street Hospital in London, UK. After two years of compulsory service as a pediatric hematologist-oncologist in Kocaeli Derince Research Hospital, she became an associate professor in pediatric hematology in 2015 and started working as a faculty member at Dokuz Eylül University. She also worked as an observer and did research in the Unit of Therapeutic Apheresis and Cellular Therapy of Children's Hospital of Philadelphia in USA. In addition to working as a consultant physician at the department of Pediatrics, division of Pediatric Hematology-Oncology and Pediatric Stem Cell Transplantation Unit of Dokuz Eylül University, she also works as an assistant attending physician at the Dokuz Eylül University Regional Blood Center. She has many academic publications in the international area and has been a member of review board for national and international medical journals. Her research interest entails pediatric acute leukemias, myeloproliferative disorders, stem cell transplantation and transfusion medicine.

Pervin Topçuoğlu
Hematology, Ankara University, Turkey

Professor Pervin Topcuoglu, MD is currently a hematology specialist at Department of Hematology of Ankara University. She is head of the Blood Centers at the same University. Dr Topcuoglu received her medical degree from Erciyes University in Kayseri, Turkey. She then completed her internal medicine residency and hematology fellowship in Ankara University, Ankara, Turkey. Then she went to London to learn tissue typing and unrelated donor search in 2009. At the same year, she worked flow cytometry laboratory of Royal Marsden Cancer Institute to increase her experience about measurable residual disease in hematological malignancy. She is co- co-director of adult stem cell transplantation unit of Ankara University. She is also head of the blood centers of Ankara University's Hospitals, Cebeci Hospital and Ibn-i Sina. She is a Jacie Accrediting Inspector of Turkey. She has written many scientific manuscripts, reviews and book chapter about especially stem cell transplantation and blood bank.

Rajko Kusec
Hematology, University of Zagreb, Croatia

Rajko Kusec, MD, PhD, has graduated from the Medical school University of Zagreb. After training in internal medicine-haematology and postgraduate studies in clinical hematology at Medical University of Vienna he worked at NDCLS at Oxford University on the molecular basis of 5q- myelodysplastic syndrome. He is at present consultant haematologist at the department of haematology and full professor of internal medicine at University of Zagreb School of medicine. His main interest are clinical and molecular aspects of chronic myeloid neoplasms and MDS.

Ravi Sarode
Hematology-Oncology, University of Texas Southwestern Medical Center, USA

Ravi Sarode, MD, is a Tenured Professor of Pathology and Internal Medicine (Hematology/Oncology), the Chief of Pathology, and the Medical Director of Clinical Laboratory Services at the University of Texas Southwestern Medical Center in Dallas. He is also the Medical Director of the Division of Transfusion Medicine and Hemostasis. He holds the John H. Childers, MD, Professorship in Pathology. He is a Co-Editor-in-Chief of "*Transfusion and Apheresis Science*". He is the past president of the American Societyfor Apheresis and one of the original writers of the ASFA guidelines. He was also invited to write anticoagulation reversal guidelines by the American Heart Association (2016-17) and the American College of Emergency Physicians (2018-2019), and the Society for Interventional Radiology (2017-18) on hemostasis and transfusion issues before any intervention. His research interests include TTP, HIT, RBCx, APS, anticoagulation monitoring and reversal, rebalanced hemostasis in cirrhosis, and restrictive transfusions. He has published more than 200 original articles and book chapters. He has conducted several clinical trials on anticoagulation reversal as an international coordinating principal investigator. His passion is to educate clinicians on appropriate use of blood components and laboratory testing to avoid patient harm, use limited resources judiciously, and to reduce the healthcare cost. Currently, he serves as a board of director for "Foundation for Women and Girls with Blood Disorder" and a co chair of anticoagulation committee of ISTH.

Rejin Kebudi
Pediatric Hematology-Oncology, Istanbul University, Turkey

Professor Rejin Kebudi, is a Professor in Pediatric Hematology-Oncology at the Istanbul University, Oncology Institute and Istanbul University Istanbul Faculty of Medicine. She is the chair of the Department of Preventive Oncology. She is a founding member and past president of the Turkish Pediatric Oncology Group (TPOG) Society. She is the chair of the International Society of Pediatric Oncology (SIOP) - Supportive Care Working Group. She has also served in the SIOP-Pediatric Oncology in Developing Countries (PODC) Committee and the Education Committee of SIOP. She has gained international experience in Hematology Division, Sind Radboud Hospital, Nijmegen, the Netherlands; Division of Pediatric Hematology-Oncology, New York University; Memorial Sloan Kettering Cancer Center; UCLA and Children's Hospital Los Angeles. Rejin Kebudi is recipient of many awards and scholarships. **She recieved the American Society of Clinical Oncology (ASCO) -2018 International Woman Who Conquer Cancer Mentorship Award.** She is a member of many major international oncology societies i.e. SIOP, ASCO. Her research interests include biology and clinical management of pediatric cancer, cancer predisposition syndromes, supportive care, and cancer care in developing countries and pediatric cancer in crisis such as in refugee settings. She is in the editorial and advisory board of many national and international medical journals.

Robert Weinstein
Hematology, University of Massachusetts, USA

Dr. Weinstein is a Phi Beta Kappa, Magna Cum Laude graduate of Brandeis University, Waltham, Massachusetts, where he majored in chemistry. After graduating from the New York University School of Medicine in New York City, he completed an internship and residency in Internal Medicine at the University of Miami Affiliated Hospitals program in Miami, Florida. He returned to New England as a fellow in hematology at the Beth Israel Hospital, Boston, where he stayed after completing his fellowship, as Assistant Professor of Medicine at Harvard Medical School. In 1985 he joined the Division of Hematology/Oncology at St. Elizabeth's Medical Center of Boston, a Tufts Medical School affiliate, where he established a program in therapeutic and donor apheresis. He later directed the Hematology and Transfusion Medicine section of the Division and became Professor of Medicine at Tufts. In 2006 he became the founding Chief of the Division of Transfusion Medicine at the UMass Memorial Medical Center, and University of Massachusetts Medical School, Worcester, Massachusetts, where he served as Professor of Medicine, Pathology and Nursing and, among other duties, co-Director of the "Host Defense and Blood" course in the first-year medical school curriculum, until November 2019. He is now Professor Emeritus in the Department of Medicine.
Dr. Weinstein has served as chair of the Hemapheresis Committee of AABB and chair of the Committee on Practice of the American Society of Hematology. He is past-president of the American Society for Apheresis, and of the World Apheresis Association. He served as Editor-in-Chief of the Journal of Clinical Apheresis from 2004 to 2015. He currently serves on the Board of Directors of the World Apheresis Association as Vice President for the Americas.

Roberto Luksch
Pediatric Hematology, IRCCS Foundation National Cancer Institute, Italy

Work address - Position: S.C. Pediatria Oncologica, Fondazione IRCCS Istituto Nazionale dei Tumori, Via Venezian 1, 20133, Milano, Italy – Permanent staff member
License: #27869, Ordine dei Medici Chirurghi della Provincia di Milano

Education
1977-1982: Graduation from Liceo Classico, Milan, Italy
1982-1987: M.D. medical graduate, *cum laude*, Università Statale di Milano, School of Medicine, Milan, Italy
1987-1991: Specialty Board on Hematology, *cum laude*, Università Statale di Milano, School of Medicine, Italy
1995-1999: Specialty Board on Oncology, *cum laude*, Università Statale di Milano, School of Medicine, Italy

Professional Experience
1985-1989: Internship and then fellow in Hematology, Ospedale Maggiore Policlinico, Milan.
1989 to 1991: Fellow at the Pediatric Oncology Dept. of Fondazione IRCCS Istituto Nazionale dei Tumori in Milan.
From 1992: Permanent staff member at the Pediatric Oncology Dept. of Fondazione IRCCS Istituto Nazionale dei Tumori in Milan
From 2010: High Specialty position for the management of the Institutional Pediatric Hemopoietic Transplant Program.

Affiliations
Associazione Italiana di Ematologia e Oncologia Pediatrica (AIEOP)
Italian Sarcoma Group (ISG)
Gruppo Italiano per il Trapianto di Midollo Osseo, cellule staminali emopoietiche e terapia cellulare (GITMO)
International Society of Pediatric Oncology (SIOP)
SIOP-Europe Neuroblastoma
Euro-EWING Consortium
European Bone Marrow Transplantation Study Group (EBMT)

Main Research interests, scientific committees
Involved in different clinical trials in accordance with ICH/GCP; main interests: clinical research in neuroblastoma and bone tumors, autologous hemopoietic stem cell transplantation in children.
From 2002 to date: National Coordinator of the SIOP-Europe Neuroblastoma Protocol for high-risk Neuroblastoma (Study 1 - NBL-HR-01-SIOPEN).
From May 2004 to date: Member of the Executive Committee of the Italian Sarcoma Group (ISG).
From May 2005 to April 2008: Member of the Executive Committee of the SIOP-Europe Neuroblastoma Group.
From 2007 to 2015 Chairman of the Scientific Committee on Bone tumors of the Associazione Italiana di Ematologia e Oncologia Pediatrica (AIEOP).
From October 2012 to October 2015: Member of the Executive Committee of AIEOP.
From May 2016 to date: Italian delegate for ISG and AIEOP in Euro-EWING Consortium
From March 2020: Member of the Executive Committee of Euro-EWING Consortium.
Principal Investigator or Co-investigator in national and international clinical trials according to GCP.

Participation in clinical trials
PI or National Coordinator in phase I/II/III clinical trials:

- National Coordinator for the "First European Protocol for High-Risk Neuroblastoma-SIOP-Europe Neuroblastoma (NBL-HR-01 trial). EudraCT 2006-001489-17; Study code INT 40/01
- PI for INT Milan of the study "A randomized phase IIb trial of bevacizumab added to temozolomide +/-irinotecan for children with refractory/relapsed neuroblastoma". EudraCT 2012-000072-42; Study code INT 71/15

- PI for INT Milan of the study "A phase I/II dose schedule finding study of ch14.18/cho continuous infusion combined with subcutaneous aldesleukin (IL-2) in patients with primary refractory or relapsed neuroblastoma - a SIOPEN study". EudraCT 2009-018077-31; Study code INT 16/13
- PI for INT Milan of the study "rEECur - International Randomised Controlled Trial of Chemotherapy for the Treatment of Recurrent and Primary Refractory Ewing Sarcoma". EudraCT 2014-000259-99 - Study code INT 91/15
- National Coordinator for the phase II trial of Italian Sarcoma Group/AIEOP "Protocollo terapeutico con chemioterapia ad alte dosi, radioterapia, terapia di mantenimento con ciclofosfamide a basse dosi e anti COX2 per sarcoma di Ewing metastatico". EudraCT 2009-011197-15; Study code INT 25/09
- National Coordinator for the phase III trial of Italian Sarcoma Group/AIEOP "Studio di fase 3 sull'efficacia dell'intensificazione della dose in pazienti con sarcoma di Ewing non metastatico". EudraCT 2008–008361–35; Study code INT 22/09
- PI for INT Milan of the study "Phase 1/2 Combined Dose Ranging and Randomised, Open-label, Comparative Study of the Efficacy and Safety of Plerixafor in Addition to Standard Regimens for Mobilisation of Haematopoietic Stem Cells into Peripheral Blood, and Subsequent Collection by Apheresis, Versus Standard Mobilisation Regimens Alone in Paediatric Patients, Aged 2 to <18 Years, with Solid Tumours Eligible for Autologous Transplants" Genzyme Study MOZ15609. EudraCT 2010-019340-40 – Study code INT 53/10
- PI for INT Milan of the Study "Phase I/II, Open-Label, Multicenter Study to evaluate the safety, tolerability and preliminary efficacy of Durvalumab monotherapy or Durvalumab in combination with tremelimumab in pediatric Patients with advanced solid tumors and haematological malignancies. Study D419EC00001-Study code INT200/18
- PI for INT Milan of the Study "A Phase 1 Study of Aurora Kinase A Inhibitor LY3295668 erbumine as a Single Agent and in Combination in Patients with Relapsed/Refractory Neuroblastoma". Study J1O-MC-JZHD LY3295668. Study code INT213/19
- National Coordinator for the phase II Study "An international multicenter phase II randomised trial evaluating and comparing two intensification treatment strategies for metastatic neuroblastoma patients with a poor response to induction chemotherapy - A SIOPEN Study" EudraCT N°: 2015-003130-27.

Publications

Author or Co-author of more than 140 papers published on international scientific journals, more than 200 abstracts presented at scientific meetings, 14 chapters of scientific books.
Peer-reviewer for National and International scientific journals.

Training on ICH/GCP

- Certification of ICH GCP vers. 1.0, Training by TransCelerate Biopharma Inc. on 19 April 2016
- Course "Sperimentazioni Cliniche di Fase I", 12 July 2018, INT Milan
- ICH Good Clinical Practice E6 (R2) 24/02/2020

Robin Foà

Hematology, Sapienza University of Rome, Italy

Professor of Hematology, 'Sapienza' University of Rome. He earned his medical degree in Turin, Italy, and specialized in pediatrics and in hematology. Worked at the MRC Leukaemia Unit, Hammersmith Hospital, London between 1976 and 1979. Sabbatical at Memorial Sloan-Kettering Cancer Center, New York, between 1991 and 1992. He is part of the European LeukemiaNet (ELN) Steering Committee and referee for national and international funding agencies. Chairman of the Scientific Committee of the 4th EHA Congress, Barcelona 1999, councilor of EHA until December 2002, and member of the Education Committee of EHA until December 2005. President-Elect, President and Past-President of EHA during the years 2007-2013. Chairman Education Committee and Outreach Unit of EHA up to June 2017. Member of EHA's Global Outreach Committee. Has authored over 800 papers, reviews and books. Has been co-editor of Leukemia and Lymphoma, and associate editor of the British Journal of Hematology and of The Hematology Journal. Editor-inchief of The Hematology Journal up to December 2004 and of Haematologica from January 2005 to February 2008.

Safiye Aktaş

Oncology, Dokuz Eylul University, Turkey

She is Head of the Department of Basic Oncology in Institute of Oncology Dokuz Eylul University,Department, Izmir TURKEY. She is a medical doctor, a Pathologist and she has PhD degree in Basic Oncology. She is a member of Society of Basic Oncology (TEOD), member of Society of Pediatric Oncology, Turkey (TPOG), Society of Pediatric Pathology, Europe; International Society of Pediatric Oncology (SIOP), MOKAD, EARTC. She is working on Cancer Stem Cell, Molecular Oncology and Animal Cancer Models. She has 206 publications, 412 presentations, 15 book chapters, 1372 citation and 20 h index (google scholar). She is married and she is mother of Tekincan Çağrı Aktaş, MD, sPhD.

Salam Salim Alkindi
Haematology, Sultan Qaboos University, Oman

Qualifications & degrees
1993 MB, BCh, BAO, BA Trinity College, University Of Dublin, Ireland.
1995 DME
1998 MSc in Molecular Medicine, TCD, Dublin
1998 MRCP
2004 FRCP
Other Exams USMLE Completed in 1996

Clinical Experience
July 1993–June 1994 Pre-registration House Officer, St James's Hospital, Dublin, Ireland
July 1994–June 1996 Senior House Officer, St James Hospital, Dublin, Ireland
July 1996–June 1997 Medical Oncology Registrar, St James's Hospital, Dublin, Ireland
July 1997–June 1998 MSc in Molecular Medicine, Trinity College, Dublin, Ireland
July1998–July 1999 Haematology Registrar, Tutor in Haematology/Trinity College
July 1999–May 2000 Senior Registrar, Department of Haematology, Sultan Qaboos University, Muscat, Oman
June 2000–May 2009 Assistant Professor, College of Medicine & Health Sciences, Sultan Qaboos University, Muscat, Oman
February 2002–July 2002 Visiting Physician, Transplant Unit, University of Washington, Medical Centre, Seattle- WA, USA
November 2001–July 2005 Deputy Hospital Director, Clinical Affairs, SQUH
September 2005–November 2015 Head-Department of Haematology, SQU,
May 2009–April 2014 Associate Professor –Haematology Department
May 2014–present Professor & Consultant Haematologist-Haematology Department

Selim Corbacioglu
Hematology,Oncology-Stem Cell Transplantation, Regensburg Children's Hospital,Germany

Selim Corbacioglu is Professor and Chair of the Department of Hematology, Oncology and Stem Cell Transplantation at the Children's Hospital in Regensburg, Germany. Professor Corbacioglu's research interest is focused on curative options for hemoglobinopathies and transplant-related systemic endothelial complications such as VOD/SOS and PRES. As the PI of several multicentre interventional trials in children, he is the PI for a prospective international trial to evaluate haploidentical HSCT in sickle cell disease as well as one of the lead investigators of the Crisp/Cas9 based gene editing trial in sickle cell disease. The recipient of the Van Bekkum Award of the EMBT in 2010, Professor Corbacioglu is author of numerous peer-reviewed articles published in the New England Journal of Medicine, Lancet, *Blood*, *Leukaemia* and *Bone Marrow Transplantation* among others. He is the current Scientific Council Chair and the Chair of the Pediatric Disease Working Party of the EBMT.

Serdar Bedii Omay
Hematology, Emsey Hospital, Turkey

Serdar Bedii Omay MD, PhD graduated from Hacettepe Medical School, Ankara, Turkey in 1985. Became an Internal Medicine specialist in Ege Medical School, İzmir, Turkey in 1990. Got a scholarship from Japanese goverment and went to Japan in 1990. He stayed there for 5 years and learned japanese language, culture, philosophy, literature. He specialised in clinical hematology, bone marrow transplantation. Achieved Ph D in molecular hematology making research in leukemic signal transduction system, protein phosphatases, leukemic proliferation and differentiation. He returned Turkey in 1995 and became Assistant Professor, Associate Professor and Professor of Hematology in 2003 in Ege Medical School.
He moved to Trabzon, Turkey in 2005 and participated in the establishment of first GMP approved cellular production facility.
He moved to Mardin, Turkey in 2008 and was the first chancellor of Mardin Artuklu University, Turkey, a boutique university specialising in social sciences mainly middle east linguistic research.
He is now working in Emsey Hospital, İstanbul, Turkey as the director of Hematology Unit.

Serpil Viera
Nursing, St Georges University NHS Hospital, UK

WORK EXPERIENCE
18/01/2021- Present Stem Cell Transplant Clinical Nurse Specialist Nursing, St Georges University NHS Hospital, UK
17/09/2020-Present Transfusion Practitioner
27/05/2002–29/03/2020 Sister / Deputy Manager, The London Clinic, London, UK
25/11/2001–20/05/2002 Adaptation Nurse, Cromwell Hospital, London, UK
21/10/1995–05/06/2001 Staff Nurse,Istanbul Medical Faculty Haematology & Bone Marrow Transplant Unit, Istanbul, Turkey

EDUCATION AND TRAINING
06/2019 -08/2019 The Critical Reflection in Clinical practice. Level 7

09/2018 -12/2018 The Advanced Clinical Assessmen, Royal Marsden, London, UK. Level 7
02/2017–06/06/2017 The Physical Assessment and Clinical Reasoning, Royal Marsden, London, UK. Level 7
09/2007-07/2011 Research in Health & Social Care. PG
Diploma
King's College Universitoy, London, UK
03/2003–06/2003 Advanced Haemato-Oncology Course, King's College University, London, UK. PG course
20/09/1991–24/07/1995 BSc Nursing, Aegean University, Izmir, Turkey

Sonay İncesoy Özdemir
Pediatric Oncology, Ankara University, Turkey

Dr. İnceosoy Özdemir graduated from Ankara University Faculty of Medicine in 2000, in Ankara, Turkey. She completed training in Pediatrics at Ankara University Children's Hospital in 2005 and Pediatric Oncology at Dr. Sami Ulus Obstetrics and Pediatrics Training and Research Hospitalin 2011, respectively. Now, she works as a Faculty Member (Assoc. Prof.) at Ankara University. During her residency and fellowship, she interested in leukemia-lymphomas and pediatric solid tumors- brain tumors, neuroblastoma, Wilms tumor, rhabdomyosarcoma, non-rhabdomyosarcoma soft tissue sarcomas, Ewing sarcoma, osteosarcoma, retinoblastoma, hepatoblastoma, vascular anomalies.

Susan O'Brien
Hematology-Oncology, University of California Irvine, USA

Susan O'Brien, MD is the associate director for Clinical Science at the Chao Family Comprehensive Cancer Center, the medical director of the Sue and Ralph Stern Center for Cancer Clinical Trials and Research, Professor of Medicine in the Department of Hematology and Oncology and the endowed chair of Cancer Clinical Science at University of California, Irvine. She earned her medical degree from and completed her residency in Internal Medicine at the University of Medicine and Dentistry of New Jersey (currently known as the Rutgers School of Biomedical and Health Sciences). She completed her fellowship at the University of Texas MD Anderson Cancer Center in Houston, TX where she spent over 30 years of her career advancing science in cancer, specifically in the field of leukemia.
Susan M. O'Brien, MD, is an internationally recognized leader in the research of treatments for both acute and chronic lymphocytic leukemias and an expert on several important therapies that are presently used as the standard of care for chronic lymphocytic leukemia. Her work is credited with improving cure rates for these blood cancers. She is routinely recognized on America's Top Doctors, Super Doctors and America's Top Doctors for Cancer. She has been a principal investigator and driving force behind more than 100 funded clinical research protocols, 30 invited articles, numerous book chapters and abstracts, and has authored more than 900 articles in peer-reviewed journals. In 2020, she was named the Giant of Cancer Care in Leukemia for sustained contributions in the field. She is the Hematology Executive member of SWOG and the president of the Society of Hematologic Oncology (SOHO).

Şebnem İzmir Güner
Hematology, Memorial Şişli Hospital, Turkey

Education Status

Degree	Area	University	Year
Licence	Medical Faculty	İstanbul Üni. Medical Faculty	1993
High Licence	Internal Medicine	İstanbul Üni. Cerrahpaşa Medical Faculty	2000
Doctora	Hematology	İstanbul Üni. Cerrahpaşa Medical Faculty	2008

Academic Titles
Assistant Professor Date: 2014
Associate Professorship Date: 06/03/2018
Managed Master's and Doctoral Theses:
Comparison of the effects of ursodeoxycholic acid pravastin and gene fibrosis treatment of non-alcoholic steatohepatitis - 2003-Istanbul-Turkey
The effects of pre- and post-treatment laboratory values and chemotherapy and radiation therapy on cardiopulmonary functions in patients with Hodgkin lymphoma 2009 - Istanbul-Turkey

Tariq Mughal
Hematology/Oncology, Tufts University, USA

Tariq trained in medicine at St George's Hospital Medical School in London (UK), followed by postgraduate training at Imperial College London at the Hammersmith Hospital, London, and the University of Colorado School of Medicine, Denver. He has specialist credentials in internal medicine, medical oncology, hematology, and stem cell transplantation in the UK and USA. He is a member of many professional societies and is involved in humanitarian activities to coordinate cancer care in Africa. In 2011, he founded Alpine Oncology Foundation, a Swissregistered cancer charity, in the memory of his mother, with the principal objective to help improve the clinical management of children and adults in Tanzania diagnosed to have blood cancer by enhancing the understanding of these diseases and

promoting access to affordable treatments, molecular diagnostic and monitoring tools. He has published over 125 peer reviewed papers, 33 cancer text book chapters and 14 blood cancer books. He is the recipient of several awards, including those from the UK Royal College of Physicians, American College of Physicians, Swiss humanitarian groups and in 2014 was awarded the Highly Commendable British Medical Association Cancer Book Award. He is a global Vice-President in Medical Affairs at Foundation Medicine Inc, Professor of Hematology/Oncology at Tufts University Medical Center, and has clinics at Kings College Hospital, London.

Tezer Kutluk
Pediatric Oncology, Hacettepe University, Turkey

Graduated from Hacettepe University Medical School Ankara-Turkey in third rank among graduates in 1981. Postdoctoral fellow and Fulbright scholar at Dept of Experimental Pediatrics, MD Anderson Cancer Center USA (1992-94). Member of ASCO, AACR, AAP, UICC, ECL, SIOP, International Children's Center, UNICEF National Committee. Served as leading healthcare executive at Hacettepe University; Vice-Director of Children's Hospital (1997-1998), Director of Children's Hospital (2000-2007), President of Institute of Child Health (2000-2004), Director of Oncology Hospital (1999-2007), President of Institute of Oncology (2004-2008), Board Member of Institute for Health Sciences (2000-2007), Member of Senate (2000-2011) & **CEO of Hacettepe University Hospitals** (2008-2011). Currently, chair of the Dept of Pediatric Oncology at Hacettepe Hospitals. More than 200 publications in peer reviewed international scientific journals with 2500 citations and numerous abstracts in international meetings. During his leadership period at Hacettepe Oncology Hospital and Institute of Oncology, he led research, education and patient care.
Long term experience on national, regional & international NGO management; "**UICC-**International Union for Cancer Control - Board Member – Geneva - Switzerland (2008 - 2012)" "President of Turkish Association for Cancer Research and Control, Ankara-Turkey (2004-2012)", "President of European Cancer Leagues-ECL – Brussels-Belgium (2009-2011)", "President of Turkish National Pediatric Society (2009-2012)", "President of Turkish Pediatric Oncology Group (2011-2013)". Chair of Turkish UNICEF national committee (2014-2021).
Senior healthcare management experience during the last 15 years. managed the hospital's day-to-day operations, finances, and quality improvement; supervised research and patient care. Board member of POEM (Pediatric Oncology Eastern Mediterranean Group, a St. Jude collaborated initiative) Honorary fellow of American Academy of Pediatrics (FAAP) in May 2014. **President of "UICC, Union for International Cancer Control, Geneva-Switzerland" for the term of 2014-2016.** The NCD Alliance Founding Board Member (Geneva-Switzerland) (2017-2019). Temporary advisor to WHO EMRO region in 2021. WHO working group member for Development of a Package of Interventions for Rehabilitation for Cancer, WHO Working group member for GICC (Global initiative for Childhood Cancer) (2018-2021).
Invited speaker at the opening session of the United Nations General Assembly for high level review of non-communicable disease in July 2014. Editorial board member of eCancer. Associate Editor of the Journal of Global Oncology published by ASCO. His main interests are global oncology, global health, cancer clinical trials, and health care management.

Tomasz Sacha
Hematology, Jagiellonian University Hospital, Poland

Ass. Prof. Tomasz Sacha MD.PhD. graduated from the Medical Academy in Kraków in 1992. During his studies, he worked actively in the research team at the Department of Internal Medicine in Kraków and won twice the prize of the Students' Scientific Society competition for the best scientific project. He worked as an assistant in the Haematology Department at the Jagiellonian University in Kraków after initial specialization in internal medicine. He specialized further in haematology after several pieces of training in Basel, Genoa and Turin, and became a lecturer and professor at the Jagiellonian University in Kraków. He received his PhD for his work on molecular diagnostics of Chronic Myeloid Leukemia (CML). In 2008, he completed his specialization in laboratory diagnostics and, in 2013, he habilitated at the Jagiellonian University. Dr Sacha established a National Molecular Reference Laboratory for quantitative BCR/ABL analysis and is responsible for the standardization of this procedure in Polish Molecular Laboratories. In 2002 he contributed to the organization of Polish Advocacy Group of patients suffering from chronic myeloid leukaemia. For his activity, he was awarded the prize: "Service for Life Award" and became an Honorary Member No 1 of this Society. Since 2013, he is a president of the Molecular Hematology Section of the Polish Society of Human Genetics, and since 2017 he is the president of Chronic Myeloid Leukemia Section of the Polish Adult Leukemia Group, and since May 2019 he is the head of The Chair and Department of Hematology in Jagiellonian University Hospital. He has an extensive clinical experience in the use of tyrosine kinase inhibitors and in the field of molecular monitoring of chronic myeloproliferative neoplasms. He is also interested in the clinical research of myeloproliferative neoplasms aiming at eliminating the leukemic stem cells.

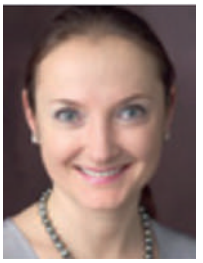
Tülin Tiraje Celkan
Pediatric Hematology –Oncology, İstinye University Vadi Liv Hospital, Turkey

MD Tülin Tiraje Celkan is 28 year expert in Pediatric Hematology-Oncology . Currently after 28 year in Istanbul University Cerrahpasa Medical Faculty, she is working in Vadi Liv Hospital and also İstinye University. She was graduated from Istanbul University Medical Faculty in 1986. She completed her residency in Anadolu University in Eskisehir in 1991. For obligatory service she was in Şanlıurfa and Viranşehir between 1991-1994. Finally she began her fellowship program at Cerrahpasa Faculty december 1994, appointed as associate professor in 2003, and professor in 2009. She visited Amsterdam Vu universty as a clinical observer in 1998. She was especially interested in different kind of bleeding and anemic patients and also leukemic and childdhood cancer patients. She has the largest patient cohort of plasminogen deficiency in the world. She has a large patient cohort of pediatric hemangiomas and AVM.

Ufuk Abacıoğlu
Radiation Oncology, Acibadem Altunizade Hospital, Turkey

Dr. Abacioglu is Professor of Radiation Oncology at Acibadem MAA University, Faculty of Medicine and working at Acibadem Altunizade Hospital in Istanbul, Turkey. He obtained his medical degree in 1993 from the University of Istanbul. He specialized in Radiation Oncology at the Istanbul University, Cerrahpasa Medical Faculty between 1993-1997. He worked in the Marmara University between 1998-2011. He was the Chair of Radiation Oncology Department between 2005-2011. He worked in Neolife medical center between 2011-2017. He has been working in the Acibadem Health Group since 2017. His main interests are neurooncology, urooncology and thoracic oncology. He authored or co-authored 96 peer-reviewed articles, 250 meeting abstracts, and 5 book chapters. He has 125 invited speakerships. He has received 15 grants or awards for his studies. He has conducted or has been involved in more than 40 national and international studies. He has 2732 citations and has an h-index of 21. He is the member of ASTRO, ESTRO, EANO, EORTC and Turkish Radiation Oncology Society.

Vera Donnenberg
Hematology, University of Pittsburgh, USA



Dr. Vera Donnenberg is an Associate Professor of Cardiothoracic Surgery in the School of Medicine at the University of Pittsburgh with a secondary appointment in the Department of Pharmaceutical Sciences. She is also the Director of Basic Research at Pitt's Heart, Lung and Esophageal Surgery Institute. Dr. Donnenberg earned her MS in Clinical Pharmacology in 1994 from Johns Hopkins University and her PhD with Honors in Pharmaceutical Sciences in 2002 from the University of Pittsburgh. Dr. Donnenberg's research focuses on:

- Tumorigenic stem cells in lung cancer, esophageal cancer, and breast cancer
- Preexisting therapy resistance in epithelial cancer stem cells
- Interaction of dormant tumor cells and regenerating tissue
- Lung immunology

Dr. Donnenberg has written over 195 publications, abstracts, book chapters, and other scientific presentations. Throughout her career she has received numerous awards, most recently the Marylou Ingram Woman in Science Award in 2013. In 2008, she was named a Fellow in the American College of Clinical Pharmacology. Dr. Donnenberg is a member of several professional and scientific societies including but not limited to the International Society for Stem Cell Research, the American Association for Cancer Research, and the International Society for Analytical Cytology. She is the President of the Great Lakes International Imaging and Flow Cytometry Association. She is on the Editorial Board of theJournal of Clinical Pharmacology.

Volkan Hazar
Pediatric Hematology-Oncology, Private Antalya Medstar Yıldız Hospital, Turkey

He graduated from Ankara University Faculty of Medicine in 1985. He completed his residency at Hacettepe University Faculty of Medicine, Department of Child Health and Diseases between 1988-1992 and then finished the Clinical Oncology master's program at Hacettepe University Health Sciences Institute. Between 1993-1996, he completed his Pediatric Oncology minor training at Hacettepe University Oncology Institute. He worked as a faculty member at Akdeniz University Faculty of Medicine, Department of Child Health and Diseases for 17 years. Between 1999 and 2000, he received training in allogeneic hematopoietic stem cell transplantation at the University of Minnesota Cancer Center Pediatric Hematology-Oncology and Blood and Marrow

Transplantation Program, Minneapolis, USA. He is currently working at Memorial Health Group Private Antalya Medstar Yıldız Hospital.

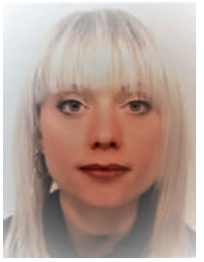
Yavuz Akçaboy
Algology/Anaesthesiology and Reanimation, Ankara Şehir Hospital, Turkey

Birth Date/Place: 12.10 .1971/Iskenderun
Specialty: Algology/Anaesthesiology and Reanimation
Education and Training Activities
M.D Medical Faculty of Osmangazi Univercity (1995)
Ankara Numune Hospital Anesthesiology and Reanimation (2001)
Professional Experience
Ankara Şehir Hospital Algology Clinics (2019-)
Ankara Numune Hospital Anesthesiology and Reanimation (2001-2019)

Yeşim Aydınok
Haematology, Ege University Children's Hospital, Turkey

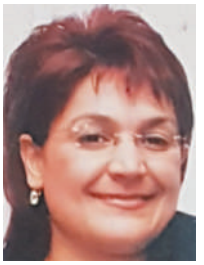
Yesim Aydinok graduated from Ege University Medical School in 1986. She was appointed as apaediatrician in 1992, and then as a paediatric haematologist in 1999 at Ege University MedicalSchool. Professor Aydinok studied haemoglobinopathies in Royal Free Hospital School of Medicine in London, UK; and clinical haematology in Great Ormond Street Hospital in London, UK as visiting Lecturer and Senior Lecturer respectively. She was appointed Professor of Paediatric Haematology at the Ege University Children's Hospital in 2005, having previously been Associate Professor. Professor Aydinok was appointed Director of the University Hospital Blood Bank in 1999.
Thalassaemia is the main focus of Professor Aydinok's clinical studies and research. She has been involved in clinical trials for new iron chelators since 2003 as well as clinical studies for emerging therapies and blood safety in Thalassaemia. Professor Aydinok has published more than 100 peer-reviewed articles, mostly in the field of thalassaemia.
She is serving as Associate Editor in Hematology Journal. She is a member of the American Society of Hematology (ASH) and the European Hematology Association (EHA). Professor Aydinok has been the Director of Haemoglobinopathy Working Group of Turkish Society of Haematology and Director of Transfusion Medicine, Blood Banking and Haemapheresis subcommittee of Turkish Society of Haematology.

Ylenia De Felici
Haeamatology-Oncology, St George's University Hospital, UK



Ylenia De Felici, is a Practice Educator in Haeamatology and Oncology. She is also a Simulation and Skills Specialist at St George's University Hospital in London.
She qualified as a Registered Nurse in Rome, Italy, in 2011 where she worked as a paramedic. When she moved to the UK in 2013 she discovered her passion for working in haematology and oncology. As a dedicated chemotherapy specialist for over 7 years, she has worked to make a real difference to those whose lives are affected by cancer, and to help them and their loved ones through the challenging process of accepting and treating their cancer diagnosis.
It was through supporting and educating her patients that she found her love for teaching. Starting in Brighton University Hospital as a students' mentor, she become a tutor, then a facilitator and finally an educator in the haematology and oncology outpatients and inpatient setting. As an educator she managed training and education needs for approximately 120 staff.
Currently she works as a senior member of the St George's Hospital Simulation Team. Her role is to enhance workforce development by providing access to high quality training opportunities to hospital staff using clinical team-based simulations. She has also embarked on further postgraduate training to develop her skills as a professional health educator.

Zühre Kaya
Paediatric Haematology, Gazi University, Turkey



Zühre Kaya, MD, is a Professor of Paediatric Haematology in the Department of Paediatrics at the Medical School of Gazi University in Ankara, Turkey.
Dr Kaya earned her medical degree at the Medical School of Gazi University, where she also completed her residency in paediatrics and a fellowship in paediatric haematology. She received further training as a clinical observer and trainee in bone marrow transplantation at the University of Pittsburgh School of Medicine/ UPMC Children's Hospital of Pittsburgh in Pittsburgh, Pennsylvania, USA. She also earned her master degree about tumour immunology at the Cancer Institute of Hacettepe University Faculty of Medicine in Ankara. She currently serves as full professor of Pediatric Hematology at the University of Gazi and director of Haemostasis laboratory of the University of Gazi in Ankara, Turkey.

ABHH Associação Brasileira de Hematologia, Hemoterapia e Terapia Celular

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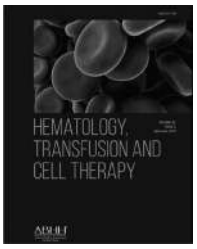

SPEAKER PRESENTATIONS

Sp01

PREDICTORS OF OUTCOME AND SURVIVAL IN PROSTATE CANCER – DATA FROM TERTIARY CARE UROLOGY INSTITUTE IN PAKISTAN

Syed Najeeb Niamatullah

Worldwide prostate cancer is the second most common cancer and fifth in causing cancer mortality in men. It accounts for about 14.1% (more than 1.4 million) of all cancers in men and responsible for 6.8% (about 0.4 million) cancer deaths in the year 2020[1]. In Pakistan, as per Globocan 2020, prostate cancer ranked 13th in new cases (around 4500 cases) and 16th in causing cancer mortality (about 2000 deaths)[2]. This discrepancy might be due to genetic heterogeneity of 220 million population or because of lack of central cancer registry. Over the past decade or so, there is a rapid change in the landscape of treatment of both localized and metastatic prostate cancer. Sophisticated surgical and radiation therapy techniques have reduced the rate of complications with improved quality of life[3]. Use of neoadjuvant, concurrent and adjuvant androgen deprivation therapy with radiation therapy in non-metastatic prostate cancer have shown to improve survival[4]. Novel anti-androgen agents (Abiraterone acetate[5,6] Apalutamide[7] and Enzalutamide[8]) and chemotherapy[9] have also proved clear benefit in castrate sensitive prostate cancer. The arena of radiotheranostics[10] has opened a new frontier in the etreatment of prostate cancer.Clinical features like serum age, ethnicity, PSA levels, Gleason's score[11] and stage at presentation have been shown to effect the prognosis in prostate cancer. Molecular, and genetic factors have been investigated in predicting the outcome in prostate cancer though relatively few are routinely used.

This study will give insight into prostate cancer in our population and help us in making guidelines for better treatment with aim to design the Decision Support Platform (DSP) for artificial intelligence (AI)[12].

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Sp02

GENERIC IMATINIB VS GLEEVEC

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The tyrosine kinase inhibitors (TKI) used in chronic myeloid leukemia (CML) treatment have dramatically changed the disease outcome. Glivec/Gleevec (branded imatinib) was the first TKI developed and has proven to be effective and safe in the long term (Hochhaus et al., 2017).

After the Glivec patent expired, many countries approved generic imatinib for CML treatment. Generic formulations are less expensive and, therefore, more affordable and available for limited resources countries.

Generic formulations of imatinib are used in India since the early 2000s (Parikh et al. 2002) and in most countries since 2016. In Brazil, generics replaced Glivec in 2013 in the first-line treatment patients with CML treated at the Public Health System.

There are still conflicting results about safety and efficacy in the published studies. Regarding pharmacological properties and bioequivalence, several studies compared branded with generic imatinib showing similarity (Malhotra et al., 2014; Arora et al., 2016, Natarajan et al., 2019).

Switching from branded to generic imatinib appears to maintain efficacy and safety (Skazan et al., 2019; Scalzulli et al., 2019; Dalle et al., 2019; Gemelli et al., 2020). However, some studies showed that patients reported new or worsening side effects after switching, primarily mild and moderate, such as nausea, edema, diarrhea, and fatigue (Abudalli et al., 2019, Scalzulli et al., 2020).

In the first-line setting, retrospective and prospective studies compared branded with generic imatinib. A recent study from China compared 236 pts treated with generic with 206 pts treated in first line with branded imatinib and did not find differences in toxicity, responses and overall survival (OS) and progression-free survival in 4 years (Dou, 2020). An updated analysis of a Brazilian study compared the outcomes of a retrospective cohort treated with Glivec with a prospective cohort treated with generics. There was a similar rate of major molecular responses and toxicity at 12 months, OS and PFS survival. (personnal communication).

In terms of health care costs, real-life studies demonstrated that generics use reduced the cost of CML treatment and are more cost-effective than branded imatinib. In the last ELN 2020 recommendations, generic imatinib is indicated as one of the options for first-line treatment in CML, if the drug has quality control of production, similar bioavailability, and efficacy (Hochaus 2020). Monitoring of the short and long-term efficacy and safety is essential.

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Sp03

REVIEW OF NEW INDICATIONS – JOURNAL OF CLINICAL APHERESIS PERSPECTIVE

Huy Pham

Therapeutic apheresis is used to treat various types of disorders. The American Society for Apheresis (ASFA) publishes evidence-based guidelines every 3 years to assist apheresis practitioners in the rationale and management of apheresis patients and outlines basic technical specifications for procedures. However, the ASFA guidelines on the use of therapeutic apheresis published by the Journal of Clinical Apheresis only include indications that have enough evidence in the medical literature to provide apheresis recommendations. The guidelines do not include all the diseases that were reported in the medical literature or the ones that may be potentially treated by apheresis in the future. For new factsheet development, the committee responsible for developing the ASFA guidelines review requests from apheresis practitioners. One or more committee members will evaluate the available literature for evidence for the use of therapeutic apheresis in the disease or indication. A minimum of 10 cases, preferably by at least 2 groups, published in the last decade in peer-reviewed journals. In the current version of the ASFA guidelines (2019), the committee considered several potential new indications; however, none of them had enough evidence to be included in the current guidelines as new factsheets. Of note, the committee will review and issue interim factsheets for new indications if necessary before the release of the next version of the guidelines. Furthermore, due to COVID-19 pandemic, the next version of the ASFA Guidelines will be released in 2023.

https://doi.org/10.1016/j.htct.2021.10.948

Sp04

HOW I TREAT NEWLY DIAGNOSED MULTIPLE MYELOMA PATIENTS?

María-Victoria Mateos

Although Multiple Myeloma (MM) remains as a potential incurable disease, important advances are occurring in the knowledge of the disease as well as in the treatment and management and as result, the overall survival is significantly improving. This benefit is applicable along the course of the disease, but the first line of therapy is crucial because almost 100% of patients will receive the first line of therapy and this is the place where patients will get the maximum benefit.

The deeper the response, the longer the progression free and overall survival and patients therefore should receive the combinations of therapies resulting in the highest rates of complete response or undetectable measurable residual disease using sensitive techniques for its detection inside and outside of the bone marrow. This is applicable to both transplant and non-transplant eligible patients and this distinction should be based on biological age together with comorbidities more than in the classical chronological age.

For transplant eligible newly diagnosed MM patients, the treatment should include induction followed by high-dose therapy and autologous stem cell transplantation and maintenance. Induction should include three-drugs based combinations (proteasome inhibitor plus immunomodulatory drug and dexamethasone) and now it is possible to add the monoclonal antibodies targeting CD38 daratumumab to the combination of VTd. Melphalan at high doses followed by transplant has demonstrated to upgrade the response and it results as a complementary rather than an alternative strategy, although in the future risk cytogenetic together with the depth of response will be introduced in the algorithm and some patients could not need transplant. Consolidation might be considered if the response previously achieved could be upgraded and maintenance will be able to maintain the response achieved and under the lenalidomide platform, new combinations are emerging like lenalidomide plus either daratumumab or carfilzomib.

In the setting of transplant ineligible patients, the old standards of care bortezomib, melphalan and prednisone and continuous therapy with lenalidomide and dexamethasone have been replaced by daratumumab plus either VMP or Rd because the addition of daratumumab significantly improved the responses rate including complete responses and undetectable measurable disease but also the outcomes in terms of progression free and overall survival. Bortezomib, lenalidomide and dexamethasone is another combination maybe of choice for fit patients and the platform to which monoclonal antibodies anti CD38 are going to be added.

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Sp05

TREATMENT OF RELAPSED, REFRACTORY DIFFUSE LARGE B CELL LYMPHOMA

Ebru Pekgüç, Burhan Ferhanoğlu

DLBCL represent almost 30% of all non-Hodgkin's lymphoma cases. More than 60% can be cured with R-CHOP (rituximab, cyclophosphamide, doxorubicin, vincristine and prednisolone) chemoimmunotherapy. Patients not responding to R-CHOP often have a poor outcome, particularly those with disease refractory to frontline or subsequent therapies. Approximately 10-15% of patients treated with R-CHOP have primary refractory disease (incomplete response or relapse within 6 months after treatment) and additional 20-25% will relapse after an initial response, typically within the first 2 years. Patients with late relapses (>2 years after treatment) have better prognosis. Patients who are eligible to curative therapy should undergo full restaging to fully assess the status of their disease and to assess prognosis. A repeat biopsy at the time of relapse should strongly be considered to ensure that an alternate histology is not present, as an indolent lymphoma has been reported on repeat biopsy in approximately 17% of cases with late relapses. Gene expression profiling has delineated two distinct molecular subtypes of DLBCL: germinal center B-cell like (GCB) and activated B-cell like (ABC); 10-15% of cases are unclassifiable. Detailed analysis of molecular aberrations have led to proposals of new unique, genetically defined subtypes beyond the cell of origin.

Transplant-eligible patients. Treatment with high-dose chemoimmunotherapy and autologous stem-cell transplantation (ASCT) offers the best chance of cure in patients with chemotherapy sensitive relapsed or refractory DLBCL, but due to advanced age and coexisting medical conditions only half of such patients are considered transplantation candidates. Approximately 50% of patients respond to initial salvage therapy and then undergo ASCT, with an overall cure rate of 25 to 35%.

Management of transplant-ineligible patients. While some elderly fit patients may be eligible to ASCT and exhibit comparable outcomes to younger patients, the majority will have comorbidities that will prevent intensive chemo-immunotherapeutic approach. Few prospective trials have been conducted in elderly patients with relapsed/refractory DLBCL. The combination of R-GEMOX and R-bendamustine have been used for paliative purposes. For these cases, new approaches are warranted and new FDA approved drugs will be discussed on new drugs session.

CAR-T cell therapy represents a major paradigm shift in the management of relapsed or refractory DLBCL. Three products, axicabtagene ciloleucil (axi-cel), tisagenlecleusil (tisa-cel) and lisocabtagene maraleucel (liso-cel) are FDA-approved as third line treatment of DLBCL and are commercially available. In pivotal studies, axi-cel, tisa-cel and liso-cel have been associated with overall and complete response rates in the range of 52-82% and 40-54%, respectively, among patients with R/R aggressive B-cell lymphoma. All three agents had characteristic toxicity profile with severe (grade > 3) CRS in 1-22% of patients, and severe (grade > 3) neurotoxicity in 12-28% of patients. Long-term outcome of ZUMA-1 trial recently published and 4 year OS is 41%, median OS is 25.8 months (17), on the other hand in Juliet trial, 5 year PFS is 31%.

Novel therapies. Despite the advance of CAR-T cell therapy, novel therapies are needed. Several agents are FDA-approved for the treatment of R/R DLBCL. **Polatuzumab-Bendamustin-Rituksimab** has received approval based of randomised phase 2 trial involving transplantation ineligible patients with significant improvement rates of complete metabolic response, PFS and OS as compared with BR alone. **Selinexor** has also received approval for patients with R/R DLBCL who have received at least two lines of therapy, as a phase 2 study has shown modest single-agent acitivity. **Tafasitamab** is a humanised anti-CD19 monoclonal antibody with augmented Fc gama receptor afinity. Results from a phase 2 study of tafasitamab combined with lenalidomide showed efficacy, leading to regulatory approval for patients DLBCL ineligible to transplantation.

Bispesific antibodies (bsAbs) refers to an antibody that has binding specificities for two different antigens. A variety of bsAbs are currently under development as therapy for B-cell lymphoma. These bsAbs target CD20 on B-cell and engage T-cells by CD3 in a 1:1 or 2:1 CD20:CD3 Fab format. In general, CRS and neurotoxicity are significantly less frequent than observed with CD-19 directed or blinatumomab therapies. In R/R DLBCL, ORR range from 37 to 90% with CRR from 19 to 55%. However, follow-up for these new bsAbs is short and the durability of responses remains to be established.

Loncastuximab tesirine is a CD-19 directed antibody-drug conjugate. It has substantial single-agent antitumour activity and produces durable responses with an acceptible safety profile. 145 patients were enrolled with diagnosis of R/R DLBCL including high-risk characteristics for poor prognosis such as double-hit, triple-hit, transformed or primary refractory DLBCL. ORR was 48% with 24% CR rate, potencially offering a new therapeutic option for heavily pre-treated patients with R/R DLBCL.

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Sp06

HAPLOIDENTICAL VERSUS UNRELATED ALLOGENEIC STEM CELL TRANSPLANTATION FOR ADULTS WITH ACUTE LEUKEMIA

Arnon Nagler

Allogeneic hematopoietic cell transplantation (HSCT) remains an important curative treatment modality for patients with high risk acute leukemia (AL) (1). A matched unrelated donor (MUD) or a haploidentical related donor (Haplo HSCT), are both valid options in the absence of a fully HLA-matched sibling donor (MSD) for HSCT in AL. In my presentation I will present and discuss focusing on the Acute Leukemia Working Party (ALWP) of the European Society for Blood and Marrow Transplantation (EBMT) registry based studies in recent few years (2-6) comparing MUD and Haplo HSCT for both acute

myelogenous leukemia (AML) (2-3) and subsequently acute lymphoblasic leukemia (ALL) (4-7) addressing various aspects including type of grafts,conditioning regimens, GVHD prophylaxis and others in patients in remission and well as in those with active disease (2-7). In large our studies have shown comparable outcome including leukemia-free (LFS), overall survival (OS) and graft versus host disease (GVHD) free (Rel) free survival (GRFS) after Haplo-HSCT mostly with post transplantation cyclophosphamide (PTCy) versus MUD allo-HCT. Haplo HSCT with PTCy was usually associated with low transplant related mortality (7) and reduce incidence of chronic GVHD especially with bone marrow (BM) grafts (2). Moreover, Haplo HSCT associated TRM versus MUD associated TRM, impressively reduced with time (7) and results in ALL improved with time (6). As for the relapse rates and the graft versus leukemia (GVL) effect although still controversial, some of the data indicate lower Rel which may speak for stronger GVL afrer Haplo HSCT.

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Sp07

GVHD TREATMENT

Elif Birtaş Ateşoğlu

Graft Versus Host Disease (GVHD) is the condition that occurs when immune cells transplanted from the graft recognize the host as foreign and initiates an immune reaction that causes disease in the transplant recipient. GVHD is divided into acute and chronic GVHD (cGVHD) based on the time of onset using a cutoff of 100 days. However, signs of acute and chronic GVHD may occur outside of these periods.

The choice of initial treatment for acute GVHD depends on the organs involved, the severity of symptoms, the prophylactic regimen used. The severity of acute GVHD is determined by an assessment of the degree of involvement of the skin, liver, and gastrointestinal tract. Grade I GVHD defines cutaneous GVHD over ≤50 percent body surface area without liver or gastrointestinal tract involvement. Grade I GVHD is managed with topical treatments such as topical steroids. Patients with Grade II or higher GVHD are treated with systemic glucocorticoids and nonabsorbable oral steroids are added for patients with gastrointestinal involvement. The most commonly used glucocorticoid is methylprednisolone with a dosage of 2 mg/kg per day. Patients whose GVHD progress by day 5 or who do not respond by day 7 are considered as corticosteroid resistant. For patients with glucocorticoid-resistant acute GVHD, participation in a clinical trial is recommended. If no trial is available, ruxolitinib,

mycophenolate mofetil, etanercept, extracorporeal photopheresis, anti-thymocyte globulin, alpha-1 antitrypsin, mesenchymal stromal cells, everolimus, or sirolimus can be used.

Clinical manifestations of cGVHD may be restricted to a single organ or widespread. The primary manifestations are skin involvement resembling lichen planus or cutaneous scleroderma, dry oral mucosa, ulcerations and sclerosis of the gastrointestinal tract, elevated serum bilirubin, and bronchiolitis obliterans. First-line treatment of cGVHD consists of steroids. For patients with mild cGVHD, localized/topical treatment can be preferred rather than systemic therapy. For initial treatment of moderate or severe cGVHD, systemic treatment with prednisone or methylprednisone at an initial dose of 1 mg/kg body weight/day should be used. The addition of azathioprine, mycophenolate mofetil, cyclosporine, thalidomide, or hydroxychloroquine to prednisone did not improve the response rate or other end-points in randomized trials. If symptoms progress during the first 4 weeks of first-line therapy or there is no improvement in symptoms within 8–12 weeks, second-line therapy should be initiated. For steroid refractory cGVHD patients ruxolitinib can be added to prednisone. Non-pharmacologic therapies such as extracorporeal phopheresis (ECP) has the advantage of being non-immunesuppressive. An immunosuppressive drug can be added to prednisone such as a calcineurin inhibitor or mycophenolate mofetil, but none shown to be effective. İbrutinib which is an inhibitor of Bruton's tyrosine kinase (BTK) has activity against cGVHD.

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Sp08

EVOLUTION OF THE PLEURAL SECRETOME ASSOCIATED WITH PLEURAL METASTASIS

Albert D. Donnenberg, PhD,
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Vera S. Donnenberg, PhD

Malignant pleural effusions (MPE) are characterized by a distinct and complex secretome that varies little between malignancies. To understand the origin and functional significance, we measured 40 cytokines and chemokines in 356 MPE (mainly breast cancer, lung cancer and esophageal cancer), and compared them to benign effusions (n=18) and normal, non-effusate pleural fluid (n=27).

Pleural effusions were collected during therapeutic drainage. Normal (non-effusate) pleural fluid was aspirated during minimally invasive cardiac surgery. Samples were clarified by centrifugation and stored at -80°C until assay. Samples were analyzed with the Luminex platform, using the MILLIPLEX MAP Human Cytokine/Chemokine Magnetic Bead Panel - Premixed 38 Plex (Cat. No. HCYTMAG-60K-PX38), plus IL-6Rα (Cat. No. HANG2MAG-12K-01), and TGFβ (Cat. No. TGFBMAG-64K-01).

The baseline secretome in normal pleural fluid is dominated by IL-6Rα, CCL2, CXCL10, FGF2, TGFβ1 and CCL22. Effector cytokines (IFNα, IFNγ, CCL3, TNFα and TNFβ) and most stimulatory cytokines (GM-CSF, TGFα, G-CSF, IL-2, IL-5, IL-7, IL-9, IL-12p40, IL-12p70, IL-3) were absent in NPF.

Benign effusions, whether due to cardiac insufficiency or chronic inflammation (asbestosis without malignancy) resulted in a profound secretomic change, with statistically significant increases in IL-6, TGFβ1, GRO, IL-10 and IL-8, and decreases in FGF2 and IL-15.

All cytokines and chemokines present at elevated levels in benign effusions were also elevated in malignant effusions, with statistically significant increases in G-CSF, CX3CL1, GM-CSF, IFNγ, IL-1TNFα, IL1Rα, CCL4, VEGF, TNFβ, EGF, IFNα, IL-4 and IL-12p40, compared to benign pleural effusions.

Benign effusions can result from an imbalance between hydrostatic and oncotic forces or from inflammation. In both conditions our data indicate a dramatic and consistent change in the pleural environment dominated by IL-6, a highly pleotropic cytokine. When bound to sIL6-Rα, IL-6 induces pro-inflammatory trans-signaling that is markedly stronger than classic signaling and a potent driver of the epithelial to mesenchymal transition (EMT). Additionally, CXCL10, IL-8 and TGFβ1 are known to promote EMT, critical for the maintenance of the normal mesothelium, but dangerous when cancer cells reach the pleural environment, because EMT is associated with cell motility, invasion and therapy resistance.

It is unknown whether prior perturbation of the pleural environment is prerequisite to pleural metastasis, or alternatively, whether chance seeding of the pleura with metastatic tumor leads to secretomic changes similar to those seen benign effusions. In either case, the pleural environment is conditioned to promote tumor growth and inhibit anti-tumor immunity. The presence of cytokines such as VEGF and FGF2 in MPE further condition the pleural environment for tumor growth. The contained nature of the pleural space suggests that local interventions with protein therapeutics to block or augment key cytokines may alter this environment and render pleural metastases susceptible to chemo- or immunotherapy.

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Sp09

INTRAPLEURAL THERAPY TO DRIVE SYSTEMIC ANTI-TUMOR IMMUNITY

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Albert D. Donnenberg, PhD

Cancer metastatic to the pleura is uniformly fatal with a median survival of six months and quality of life that is diminished by dyspnea and discomfort. There is currently no curative treatment once metastatic disease has occurred. Current standard of care treatment for malignant pleural effusions (MPE) is exclusively palliative, consisting of drainage, followed by systemic therapy (chemotherapy, endocrine, or immunotherapy). Our institutional experience with systemic immune checkpoint blockers indicates a marginal

improvement in overall survival in a small subset of patients. Clearly, the incidence of MPE and lack of effective treatments has created an urgent unmet need to develop an effective treatment.

Our studies of the pleural secretome in non-small cell lung cancer and mesothelioma, as well as extensive secretomic data in MPE from other cancers, indicate that the IL-6/IL-6Rα axis is prominent in pleural effusions and drives the epithelial to mesenchymal transition (EMT). We have identified additional cytokines that are absent in normal pleural fluid but prominent in malignant effusions. We have also found that MPE T cells, removed from their environment, are capable of expansion in culture, polyfunctional cytokine response, and are cytolytic to autologous tumor. Because the pleural space is lined with mesothelial cells joined by tight junctions, we hypothesize that it acts as a cytokine-rich bioreactor which promotes EMT in cancer cells metastatic to the pleura, and redirects the abundant immune infiltrate to promote, rather than inhibit, tumor growth. We hypothesize that as a master cytokine, IL-6 and its soluble receptor drive this process. Therefore, local blockade of sIL-6Rα will alter the pleural cytokine milieu, inhibiting aggressive tumor behavior and promoting anti-tumor immune response. Once unleashed in the pleural space, tumor-specific T cells could be expected to migrate to the periphery through the draining lymphatics and respond to extra-pleural metastases. Further, based on our current data, we are confident that the 100 million MPE T cells that are routinely recovered during routine therapeutic MPE drainage can be expanded in culture for an adoptive cellular therapy product that is faster, better and cheaper than conventional solid-tumor derived culture-expanded tumor infiltrating lymphocytes (TIL).

What remains to be determined is whether blockade of dominant cytokines in MPE together with anti-PD-1/PD-L1 therapy can condition the pleural environment sufficiently to support and expand the existing anti-tumor responses.

Combining the knowledge derived from these studies we propose to devise a personalized combined treatment strategy that conditions the pleural environment without incurring systemic toxicities and facilitates local and systemic anti-tumor immune response.

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Sp10

CAR T-CELL

Francesco Saglio

Chimeric Antigen Receptor (CAR)-T cell therapy is emerging as one of the most powerful and promising therapeutictool for the treatment of malignat diseases. CAR-T cells are T-lymphocytes modified *in vitro* to harbor an artificial molecular construct (CAR) made by an extracellular domain consisting of a single-chain variable fragment (scFv) recognizing a specific tumor antigen joined to a transmembrane domain which is linked to the signaling unit CD3ζ and co-stimulatory units CD28 or 4-1BB of the T-cell receptor, making them capable to recognize and to kill tumor's cell in a HLA-independent manner. CAR T-cell therapy consists in the selection of patient's normal T-cells via leukapheresis, activation, transduction to express CARs using lentiviral or retroviral vectors, expansion of transduced cells and infusion of the final product back to the patient. After the CAR T-cells are infused back into the patient, the engineered cells proliferate, recognize and kill tumor cells bearing the specific antigen the CAR is directed against.

In recent years US Food and Drug Administration (FDA) and European Medicine Agency (EMA) approved CD19 CAR T-cells in patients affected by relapsed and refractory ALL under the age of 25 years, adult patients affected by Non-Hodgkin Lymphomas and more recently adult patients affected by Multiple Myeloma and this technology is moving from an experimental approach available for very selected patients treated in a small number of Centers to a standard-of-care therapy available almost worldwide.

The diffusion of commercially available CAR-T cells has increased the number of patients treated by this cell therapy products and has also permitted to confirm their safety and efficacy profile in the "real life".

The diffusion of this technology requires a re-definition of the role of all the other therapy options currently available including other forms of immuno-therapy as monoclonal antibodies, bi-specific monoclonal antibodies and, upon all, allogeneic hematopoietic stem cell transplantation (alloHSCT).

Until now data are limited, and the above-mentioned question is far from being answered but there are some observations derived from pivotal clinical trials that probably will help us in building future trials aimed to define this topic.

Another open question is represented by the persistence of these cells in the patients that is related to the definition of the need for patients responding to CAR-T cells to proceed to other therapies, especially to alloHSCT, to consolidate disease remission. Moreover CAR-T cells are characterized by some peculiar side effects as the Cytokines Release Syndrome or CNS toxicity that if are not properly detected and treated may lead to very severe consequences with a significant mortality rate.

Finally, some technological, practical and economical considerations need to be defined in order to extend the use of this technology worldwide, in respect to the other currently available therapies.

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Sp11

TARGETED THERAPY IN AML TREATMENT

Giovanni Martinelli

Prof. Martinelli will speak about new drugs in the treatment of acute leukemias, starting from mechanisms of actions of the compounds and explaining strategies for clinical research.

Venetoclax is a bcl-2 inhibitor that is entering in the therapy of AML. The use of venetoclax will be explored with particular attention to combination with purine and pyrimidine analogs and metabolism.

Ponatinib is a pan TKI with particular activity on BCR-ABL1 fusion protein, VEGF and FLT3, and a high number of collateral activity on immunogenic cell death and environment. Ponatinib is able to protect against the emergence of BCR-ABL1 mutations. Ponatinib was used in new-onset and relapse-refractory Ph+ ALL. The use of ponatinib may be further expanded in Ph-like/3C-UP ALL and in subcategories of AML.

Gilteritinib is an FLT3, AXL, and ALK inhibitor with single-agent activity in R/R AML. Gilteritinib multikinase inhibition and differentiation effects will be explored, together with combination with chemotherapy.

MDM2 and Menin inhibition are appealing strategies in the treatment of predefined subsets of AML, preliminary laboratory data will be presented.

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Sp12

HAEMOPHILIA AND NURSING CARE

Marcela Ganzella

Hemophilia is a rare, inherited, X-chromosome-linked bleeding disorder resulting from a deficiency of clotting factor VIII (hemophilia A) or factor IX (hemophilia B). In the world, according to the World Federation of Hemophilia 2019, there are currently approximately 157,517 people diagnosed with Hemophilia A and 31,997 Hemophilia B. Nurses may be involved in providing direct clinical care, education, support and self-management for patients and their families. In this presentation we will talk about important aspects of hemophilia: pathophysiology, nursing care and concern, treatment pathway and patient education

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Sp13

RHABDOMYOSARCOMA

Mehmet Fatih Okçu

Rhabdomyosarcoma is the most common soft tissue sarcoma in childhood. While based on the cooperative group work from US and Europe diagnosis and treatment guidelines exist management controversies exist for newly diagnosed intermediate and high risk disease and in patients with relapses. The presentation will discuss further details on management of these patient groups in the light of recent published work.

Non-rhabdomyosarcomatous soft tissue sarcomas (NRSTS)

NRSTS are large group of heterogenous group of soft tissue sarcoma diagnoses representing half of all childhood soft tissue sarcomas. In this presentation we will review standard approach in general on diagnosis and management of soft tissue tumors and further discuss how recent molecular work informs diagnosis and management of subgroup of patients.

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Sp14

THE APPROACH AND DIAGNOSIS OF COOMBS NEGATIVE HEMOLYTIC ANEMIAS

Achille Iolascon

Anemia affects 1.6 billion of people worldwide, about 10% of these individuals are affected by rare anemias of which 80% are hereditary.[1] Hereditary anemias (HA) embrace a highly heterogeneous group of disorders characterized by anemia of variable degree and by complex genotype-phenotype correlations. Differential diagnosis, classification, and patient stratification among HA are often very difficult.

To date, the major current application of next generation sequencing (NGS) in diagnostics is through disease-targeted tests for which multiple causal genes are known. Some studies have already demonstrated the utility of targeted-NGS (t-NGS) approach in the study of specific subtypes of HA patients. Here, we described the diagnostic workflow based on t-NGS that we developed for the diagnosis of patients affected by HA. Within this wide group of disorders, we included: (1) hyporegenerative anemias, as congenital dyserythropoietic anemias (CDA); (2) hemolytic anemias due to red cell membrane defects, as hereditary spherocytosis (HS) and stomatocytosis (HSt); hemolytic anemias due to enzymatic defects, as pyruvate kinase (PK) deficiency.[1–5]

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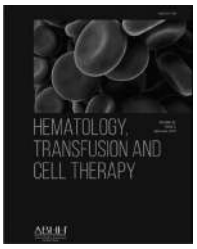

PEDIATRIC PRESENTATIONS

Sp01

INFLAMMATION AND CANCER

Jean-François Rossi

Normal inflammatory response represents the initial phase of the immune response. This normal or "good" inflammatory response is transient, followed by a return to the normal status. Dysregulated or "bad" inflammatory responses are observed in inflammatory, infectious diseases and cancers, and can be characterized by inappropriate levels of inflammatory markers, speed of generation, and major site of production, such as a vital organ. Chronic or smoldering inflammation is associated to cancer initiation as observed in lung, gut, or cervical cancers and with obesity, which is associated to multiple factors such as dysmetabolism, gut dysbiosis, immune dysfunction and immune exhaustion. Inflammation is also associated with cancer promotion, proliferation, metastasis, and thrombosis risks. Due to the persistent and high inflammatory response, immune tolerance is also amplified and leads to immune resistance. Thus, to amplify cancer cell control, the dynamics of the inflammatory response must be evaluated to determine its negative impact and to open a more personalized therapy including the return to a normal inflammatory/immune response. To optimize anti-IL6 therapies, we developed an algorithm to mathematically model inhibition of IL-6 activity in the presence of either siltuximab (anti-IL-6), tocilizumab (anti-IL-6R), or both. By analyzing data in COVID-19 cytokine storm, biological efficiency was not reached showing that there is a need to optimize anti-IL6/antiIL6R therapies which were not correctly used. We also retrospectively analyzed data from the randomized study with siltuximab in Castleman disease, and open new possibilities in cancer, particularly for immune therapies.

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2531-1379/

Sp02

NEW ADVANCES IN PEDIATRIC ACUTE MYELOID LEUKEMIA

Özlem Tüfekçi

Pediatric acute myeloid leukemia (AML) accounts for ~20% of childhood leukemias and has been a clinical challenge due to its heterogeneity, high relapse rate and therapy-related toxicity. As compared to 90% overall survival in childhood acute lymphoblastic leukemia, event-free survival and overall survival remain suboptimal at 45% and 65%, respectively at three years and nearly half of children will relapse. Treatment protocols for pediatric AML have converged to a standard that includes four or five cycles of intensified myelosuppressive chemotherapy with cytarabine and anthracyclines followed by hematopoietic stem cell transplantation (HSCT) for a subgroup of patients. It is clear that the ceiling to further intensification of standard chemotherapy has been reached in AML, urgently necessitating novel therapeutic strategies. Recent developments in comprehensive mutation testing and integration of data from adult clinical trials led physicians try novel agents in pediatric AML patients especially in the relapse/refractory setting. In this context major treatment modalities and novel drugs in childhood AML include immunotherapy including drug-antibody conjugates and chimeric antigen receptor T-cell (CAR-T cell) therapy, epigenetic modifiers, tyrosine kinase inhibitors,and other novel agents. The addition of gemtuzumab ozogamicin and FLT3 inhibitors to some standard chemotherapy protocols has been becoming a standard of care in treatment of pediactric AML. Besides, major advances have also been achieved in acute promyelocytic leukemia (APL). The combination of ATO and ATRA without chemotherapy is now the standard chemotherapy for adults that are in the standard risk. Based on these findings; recent trials on pediatric APL patients aim to use ATRA plus ATO while minimizing the use of chemotherapy.

Recently, considerable progresses have been achieved in defining the molecular landscape of AML that lead scientists to discovery of novel drugs. There have been numereous ongoing studies on new therapeutic agents for AML, and

some of them have already been included in the standard treatment protocols, but further studies on other new agents are needed to determine their efficacy in children.

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Sp03

MEDICAL TREATMENT IN HODGKIN LYMPHOMA

Nilgun Kurucu

The treatment of HL has been designed according to risk stratification. Risk stratification is based on presenting features at diagnosis. Stage of disease, presence of bulky disease, presence of B symptoms, and number of involved nodes are the parameters of risk determination. Low risk group includes stage IA and IIA disease with no tumor bulk and no extranodal involvement. Stage IA and IIA with bulky disease or extranodal involvement, and stage IB and stage IIIA are defined as intermediate risk. Stage IIB with with bulky disease or extranodal involvement, IIIB and IV diseases are in high risk group. Treatment of HL in children consists of combined modality treatment including multiagent chemotherapy and low dose involved field radiotherapy. Modern therapy of HL can be based on both risk group and response (Table I, II, III). Standard chemotherapy in Hodgkin disease is ABVD or MOPP derivatives. Adriamycine, Dacarbazine, Bleomisin and Vinblastin are the major drugs of ABVD derivative protocols. MOPP derivatives include generally cylophospamide, vincristine, procarbazine, prednisolone. Hodgkin lymphoma is a radiosensitive disease. In general, doses of 15 to 25 Gy are used with modification based on patient and disease characteristics. In combined modality era, the extended treatment volumes are no longer needed. The Involved fields reduce the exposure of normal tissue and the late side effects by not reducing local control rate. The implementation of more tailored fields is a progress toward this goal, treating only the individual lymph nodes with a margin for microscopic disease. This, in conjunction with modern imaging, will continue to reduce exposure of normal tissue to radiation while maintaining equivalent local disease control rates. In some recent trials, radiotherapy was omitted in localized low risk disease and early responder patients.

Combined modality treatment will result in very high cure rates (Table I, II, III). The treatment results in children with early stage disease are perfect. Disease-free survival and overall survival reach up to 95% and 100%, respectively. About ten to twenty percent of advance stage patients may relapse. Since the prognostic outlook and life expectancy of HL have shown significant progress over the last decades, the quality of life and prevention of late side effects have gained considerable importance. Balance ensuring the best opportunity for long-term disease-free survival and the lowest risk of severe treatment toxicity should be achieved.

Table I. Treatment of Low Risk Group

Low Risk Studies	Treatment		EFS
POG 8625	6 MOPP/ABVD	+None	83%
(1986-92, 247 pts)	4 MOPP/ABVD	+LD-IFRT	91%
CCG 5942	4COPP/ABV	+ None	89%
(1995-98, 826 pts)	4COPP/ABV	+ LD-IFRT	100%
COG 9426	2 DBVE	CR ⇨ +LDIFRT	87%
(1996-2000, 294 pts)		<CR ⇨ +2DBVE+ LDIFRT	85%
COG AHOD0431	AVPC	CR ⇨ +None	78%
(2006-2009, 278 pts)		<CR ⇨ +LDIFRT	83%
MDH90	4 VBVP	CR ⇨ +IFRT	90%
(1990-2008,202 pts)	4 VBVP	<CR ⇨ +2-4 OPPA +IFRT	78%
GPOH-HD 2002	2 OEPA(M)/OPPA(F)	CR ⇨ +None	93%
(2002-2005,573 pts)		<CR ⇨ +LD-IFRT	92%

Table II. Treatment of Intermediate Risk Group

İntermediate Risk Studies	Treatment		EFS
CCG 5942	6 COPP/ABV	⇨ + None	78%
(1995-98,834 pts)		⇨ + LD-IFRT	84%
POG 9425	3 ABVE-PC	RER⇨ +LDIFRT	86%
(1997-2001, 219 pts)		SER ⇨ +2ABVE-PC+ LDIFRT	88%
AHOD0031	2 ABVE–PC	RER ⇨ CR +2ABVE-PC + None	84%
(2002-2009, 1734)		RER ⇨ CR + 2ABVE-PC+ LDIFRT	88%
		RER ⇨ <CR +2ABVE-PC+LDIFRT	87%
		SER ⇨ +2DECA+2ABVE-	79%
	PC+LDIFRT		75%
		SER ⇨ +2ABVE-PC+LDIFRT	
GPOH-HD2002	2 OEPA/OPPA+4COPP/COPADC +SDIFRT		88%
(1997-2001, 219 pts)			

Table III. Treatment of High Risk Group

High Risk Studies	Treatment		EFS
POG 8725 (1987-92, 183 pts)	4 MOPP/4ABVD	CR ⇨ +None ⇨ +LDTNI	82% 87%
CCG 5942 (1995-98, 826 pts)	COPP/ABV+CHOP+Ara-C/VP-16	⇨ +None ⇨ +LDIFRT	81% 90%
POG 9425 (1997-2001, 219 pts)	3 ABVE-PC LDIFRT	RER ⇨ +LDIFRT SER ⇨ +2ABVE-PC+	88% 82%
CCG 59704 (1999-2002, 99 pts)	4 BEACOPP/ABVD +4BEACOP+LDIFRT	RER (F) ⇨ +4 COPP/ABV RER (M) ⇨ +2ABVD+ LDIFRT SER ⇨	94%
COG AHOD0831 (2009-2012, 166)	2ABVE-PC PC+LDIFRT PC+IV+LDIFRT	RER ⇨ +2ABVE- SER ⇨ +2ABVE-	84% 73%
GPOH-HD2002 (2013-2020, 77pts)	2 OEPA/OPPA+4COPP/COPADC +SDIFRT		87%

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Sp04

LATE EFFECTS OF CHILDHOOD CANCER: THE FOUNDATION FOR RISK-STRATIFIED PEDIATRIC CANCER CARE LONG TERM

Melissa M. Hudson

Progress in biology and therapy for pediatric cancers has produced a growing population of long-term (exceeding 5 years) cancer survivors who are at increased risk for morbidity and premature mortality related directly to the cancer itself, to pre- and co-existing comorbidities, and to exposure to cancer treatment modalities. Consequently, cancer survivors represent an important group that may benefit from risk assessment, disease prevention services, and health promotion counseling. Risk-based survivor care that includes tailored screening, surveillance, and prevention based on the previous cancer, cancer therapy, genetic predispositions, lifestyle behaviors, and co-morbid health conditions is recommended for all survivors. To optimize risk-based survivor care, several groups have organized health screening guidelines based on evidence from the literature linking specific therapeutic interventions with late treatment complications.

In addition to evidence-based guidelines, optimal survivorship care requires a comprehensive, multidisciplinary care infrastructure or model of care. A variety of models of survivorship care have been described across practice settings including academic models, community practice models, and shared-care models. The shared-care model, which features co-management of survivors by oncology and primary care providers, has been promoted for its facilitation of survivor access to cancer- and non–cancer-related preventive services. A risk-stratified approach has been recommended in defining the ideal model of follow-up care for specific survivors. Risk factors typically considered in these models include treatment intensity, risk of recurrence, persistence of moderate to severe toxicity of therapy, risk of serious physical late effects, and psychosocial status.

To facilitate care coordination among oncologists and community providers, the use of a written treatment summary and care plan is recommended to communicate the survivor's health status, provide a care roadmap to ensure survivor-appropriate services, and clearly delineate provider roles. However, adherence to this recommendation by oncology providers remains suboptimal because of the significant time and resource barriers involved in organizing survivorship care plans. Identification of the essential components of survivorship care plans, which may vary across health care settings, is important to facilitate their widespread adoption. The integration of automated, programmable applications within existing electronic health record systems may expedite the development of care plan summaries in the future. To enhance awareness of survivorship health issues, educational efforts must be expanded to target not only oncology providers, but also practicing clinicians, graduate medical trainees, and survivors.

Continued follow-up during adulthood is essential to accurately characterize very late cancer-related sequelae and determine if complications resulting from cancer therapy will be exacerbated by the organ dysfunction associated with aging. In this way, late health outcomes research plays a critical role in refining screening/surveillance recommendations and guiding the development of preventive and remedial interventions to preserve health.

This presentation will review the scope of long-term health effects after pediatric cancer, the challenges in coordinating long-term survivor care, health screening guideline resources available to facilitate survivor care, and the impact of late health outcomes research among adults treated for childhood cancer.

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Sp05

UPDATE ON FERTILITY PRESERVATION

Murat Sönmezer

Over the past 50 years, there has been a remarkable improvement in the cancer survival rates due to significant progress in the diagnosis and treatment. However, multi–agent chemotherapy regimens and/or radiotherapy, and hematopoietic stem cell treatments are associated with significant long–term sequels such as growth disorders, cardiovascular problems, neurocognitive abnormalities, secondary malignant tumors, and reproductive failure. Cytotoxic therapy has also been used in some non-malignant hematologic, immunologic, and genetic diseases, which are resistant to standard treatment modalities. Moreover, gonadal surgery for benign gynecological lesions including endometriomas may be associated with decreased ovarian reserve, even can result in a permanent ovarian failure especially if the disease is bilateral. It was projected that in 2020, there would be approximately 90.000 new cancer cases in adolescents and young adults, on the other hand overall cancer mortality declined by 1% annually, from 2008 to 2017 among all age and sex groups [1]. As a result of the increasing number of cancer survivors, a strong focus has been placed on the delayed effects of cancer treatments which can all affect future quality of life of the patients.

When selecting the most optimal option to preserve fertility one should analyze all possible confounding factors such as age of the patient, available time before cancer treatment, ovarian reserve, the type and duration of chemotherapy and/or radiotherapy, and couple status. There are currently various established and non-established techniques for fertility preservation performed worldwide. Embryo cryopreservation has long been practiced with high success rates which is quite similar to outcomes using fresh embryo transfer. Likewise, with the advent of modern freezing technologies including vitrification, the success rates with oocyte freezing have also remarkably increased. Before oocyte or embryo cryopreservation at least 2 weeks is required for ovarian stimulation before oocyte retrieval. For estrogen sensitive tumors including breast and endometrial cancers, safer ovarian stimulation protocols incorporating letrozole were defined with high success rates. Patients undergoing pelvic radiotherapy laparoscopic ovarian transposition can be performed, however the success rates vary between 16-90%. Ovarian tissue cryopreservation and transplantation is among one of the key components of available fertility preservation techniques with more than 200 reported livebirths worldwide. Transplantation of frozen thawed ovarian tissue is not only a viable option to achieve pregnancy, but it also enables resumption of reproductive functions by producing hormones that has a substantial impact on the quality of life of the patients suffering premature ovarian failure. One of the most important advantages of ovarian tissue freezing is that there is no need to delay cancer treatment since ovarian stimulation is not required. Although various methodologies have been tested in many animal and human studies for ovarian tissue freezing, until recently, this procedure has been classified as “experimental” as the precise methodology has not yet been established. However, with increased clinical success together with increasing number of healthy live births in recent years, ovarian tissue freezing is now considered as an "acceptable" method for fertility preservation. The feasibility of autologous hematopoietic stem cell transplantation to improve pregnancy rates in patients with poor ovarian reserve has also been investigated with reported success rates in limited number of recent studies.

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Sp06

PRINCIPLES OF TRANSFUSION IN CHILDREN WITH CANCER

Dilek Gürlek Gökçebay

Transfusion therapy has an important role for pediatric cancer patients. A multicenter retrospective study of 4766 children with cancer demonstrated that 39.3% of the patients were given a transfusion. Red blood cells (RBCs) and platelets were the most commonly transfused components. Patients between 1 to <6 years of age were most likely to be transfused and HSCT, acute myeloid leukemia, and aplastic anemia were most often associated with transfusion.

Anemia occurs due to the suppression or dysfunction of erythropoiesis secondary to the underlying disease, as well as a consequence of bleeding in children with cancer. National audits of pediatric RBC transfusions in the United Kingdom have reported that more than half of pediatric transfusions were given to hematology/oncology patients. The balance between the tolerance to anemia and the need for transfusion may be different from other patients, because of underlying disease, the presence of comorbidities that influence the tolerance to anemia, and complications of multiple previous transfusions. In children with cancer undergoing hematopoietic stem cell transplantation (HSCT) who are at risk for critical illness and hemodynamically stable, suggested Hb value is 7 to 8 g/dL for the threshold of RBC transfusion. RBC transfusions are usually dosed as 10 to 15 mL/kg. However,the decision to transfuse should not be driven by the hemoglobin concentration, the patient’s clinical status should also be taken into consideration. Leukoreduction is one of the most common modifications to cellular blood components with universal leukoreduction being accepted increasingly as a standard. Cellular blood components including viable lymphocytes should also need to be irradiated in children with cancer. The gamma irradiation prevents T-lymphocytes from proliferating and reduces the risk of transfusion-associated

graft-versus-host disease (TA-GVHD), in patients with significant immunosuppression due to chemotherapy (eg. purine analogs), immunomodulators, radiation, or HSCT patients.

Thrombocytopenia can occur in nearly all children with cancer during their disease course as a result of bone marrow infiltration, chemotherapy, or associated illness, such as sepsis or disseminated intravascular coagulopathy. Platelet transfusions are prescribed to prevent or treat bleeding (referred to as prophylactic or therapeutic transfusions, respectively). In critically ill children with an underlying oncologic diagnosis, 71% of the platelet transfusions were given prophylactically. American Society of Clinical Oncology recommmends for a prophylactic platelet transfusion threshold of 10×10^9/L. However, a scarce data exists to platelet transfusion therapy in pediatric cancer patients with clinically relevant bleeding, fever, hyperleukocytosis, infection, or receiving anticoagulation. Dosing recommendation is 10 to 15 mL/kg of ideal body weight. Leucoreduction and irradiation are also recommended for platelet transfusions in pediatric cancer patients.

Fresh Frozen Plasma (FFP) is transfused to correct multiple coagulation factor deficiencies in patients with active bleeding (therapeutic transfusions) or to prevent bleeding before invasive procedures (prophylactic transfusions). Dosing recommendation is 10 to 20 mL/kg. Patients with cancer may be at risk for abnormalities of hemostasis due to tumor pathology (eg. AML M3) and evolution of the disease as well as treatment effect. Besides, FFP transfusion has significant risk that should be weighed against its perceived benefit.

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Sp07

AN APPROACH TO PAIN IN CHILDREN WITH CANCER

Yavuz Akçaboy

The International Association for the Study of Pain defines pain as "an unpleasant sensory and emotional experience associated with, or relating that associated with, actual or potential tissue damage." although this definition is made for adults, it also applies to children. pain is a very complex phenomenon and is modulated by many factors. It usually begins with a tissue injury, followed immediately by the activation of the neural pathway. but this physiological state cannot explain the experience of pain. the experience of pain depends on the person's interpretation.

About 15,000 children and adolescents are diagnosed with cancer in the United States every year, and 80% of them survive for a long time with their diseases. Almost all these children experience pain somewhere during their own cancer experience. This condition occurs either as a result of the disease itself, or as a side effect of treatment, or as a result of procedures related to their care. In the whole process of cancer, pain is the most common, severe and stressful symptom.

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Sp08

MEDICAL TREATMENT IN EWING SARCOMA

Roberto Luksch

Multidisciplinary treatment has improved the prognosis of Ewing sarcoma (ES) over the last decades, with the introduction of multi-agent chemotherapy and multidisciplinary patient management. This improvement was due from both the use of intensified systemic treatments and optimization of local treatments, using surgery and radiotherapy in different combinations and sequences.

Nowadays the treatment generally consists of induction chemotherapy, followed by surgery and/or local radiotherapy, and then maintenance chemotherapy.

Extended international collaboration has enabled prognostic groups to be better defined and risk-adapted treatment strategies to be tailored to patients.

The most remarkable steps along the way in which chemotherapy has improved the prognosis for ES are different: 1-The benefit of adding ifosfamide and etoposide (IE) to the vincristine, doxorubicin, and cyclophosphamide (VDC) combination for localized ES was demonstrated; this benefit was not demonstrated in patients with metastatic disease (Grier 2003). 2-The randomized EuroEwing99 R1 trial addressed the equivalence of ifosfamide and cyclophosphamide in localized disease: the conclusion was that cyclophosphamide might be able to replace ifosfamide in consolidation treatment of standard-risk ES (Le Deley 2016) 3-A randomized Childrens Oncology Group trial demonstrated that dose-intensifying chemotherapy by shortening the interval between treatments with the regimen VDC/IE (Vincristine+Doxorubicin+Cyclophosphamide, and Ifosfamide+Etoposide) led to a longer 5-year event-free survival in cases of localized disease. Compared with those assigned to the 3-week standard treatment interval, patients assigned to the 2-week treatment interval had a longer 5-year event-free survival (Womer 2012) . This result was corroborated by the EuroEWING Consortium Study 2012, where the compressed VDC/IE regimen was randomly compared with VIDE (vincristine, ifosfamide, doxorubicin, and etoposide), which was the backbone induction regimen of the EEC-99 trial (Brennan 2020). 4-The efficacy of a consolidation treatment with high-dose melphalan/busulfan (BuMel) + stem cell rescue was examined in prospective phase II non-randomized studies (Ferrari 2011), and in a large randomized study by the EuroEWING Consortium. For localized ES with a poor histological response to induction chemotherapy, there were signs of BuMel proving more effective than standard maintenance chemotherapy (Whelan 2018). Evidence of efficacy of BuMel in metastatic disease is limited to patients with pulmonary metastases, in which case its value is debatable, and has to be set against a significantly higher risk of severe acute and late side effects when compared with standard maintenance chemotherapy (Dirksen 2019).

There is an unmet medical need to improve prognosis of patients with synchronous metastatic disease or relapse. In the last decades, efficacy of new drugs was disappointing and no new drugs have been successfully introduced up to now in front

line treatment. Early clinical data suggest that strategies using multi-tyrosine kinase inhibitors (TKI) carrying anti-angiogenic activities are among the most active new drugs tested. Several TKI are currently being tested as single-agent in patients with relapse/refractory Ewing sarcoma with encouraging results in phase II trials, and may show efficacy (Attia 2017, Italiano 2020).

Given the complexity and rarity of Ewing sarcoma, it is essential for patients to be treated at selected reference institutions with specific expertise and multidisciplinary skills.

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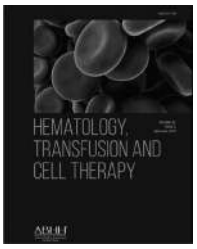

ORAL PRESENTATIONS

ADULT HEMATOLOGY ABSTRACT CATEGORIES

CHRONIC LEUKEMIAS

OP 01

THE IMPACT OF TYROSINE KINASE INHIBITORS ON FATHERHOOD IN PATIENTS WITH CHRONIC MYELOID LEUKEMIA, A SINGLE INSTITUTION EXPERIENCE

Mohammad Abu-Tineh, Awni Alshurafa, Elrazi Awadelkarim Hamid Ali, Yousef Hailan, Waail Rozi, Abdulqader nashwan, mohamed yassin, Ashraf Omer Elamin Ahmed, Khalid Mohamed Ibrahim Alhaj ALbsheer

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Objective: Following the launch of the TKI's (tyrosine kinase inhibitors) for the treatment of CML, establishing its significant control over the disease, other dimensions have emerged in regard to the safety of treatment, particularly the effect on Male fertility and fatherhood. This study was conducted to review the real-life data on the effect of TKI on the fertility of male patients in the National Center of cancer care and research (NCCCR) in Qatar. **Case report:** Inclusion Criteria: Male patient diagnosed with CML, in Chronic or accelerated phase; 18 years of age or older and actively receiving tyrosine kinase inhibitors including (Imatinib, dasatinib,nilotinib) with the following: -Patients with no known issues with regards to fertility, (fertility is intact) Patients who developed fertility issues after the diagnosis of CML and starting TKI's. has been evaluated by an andrologist, and his evaluation concluded its TKI related. **Methodology:** A single-center study conducted a mixed-design study by phone interviews with CML male patients in the Chronic or accelerated phase, being followed up in NCCCR (national center for cancer care and research), evaluating the effect of Imatinib, Dasatinib, nilotinib, on their fertility whether they are taking it as first, a second, or third line of treatment. **Results:** 150 patients were interviewed to be included in the study, 22 patients had concerns related to medications safety and possible transmission of the disease, 33 patients had their families completed by the time of diagnosis. 26 patients have met the inclusion criteria, offspring's total number was 43, 97.6% were full-term, had a normal delivery, and normal average weight at delivery. No stillbirths, fetal demise, or congenital anomaly were reported. All offspring had normal development and growth. **Conclusion:** Around 98% of male CML patients taking imatinib, Dasatinib, Nilotinib had their offspring born normally with no delivery complications noted, all had no congenital anomaly had normal growth and development, and no CML-related cancers were diagnosed. Further studies with a larger sample size are required to shed light on the TKI outcome on fatherhood in CML patients.

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LYMPHOMA

OP 02

PROGNOSIS FACTORS IN AGGRESSIVE NON-HODGKIN LYMPHOMAS WITH PRIMARY INVOLVEMENT OF THE SPLEEN

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Objective: The increased morbidity and DALY rates in the working-age population, commonly late diagnosis and unfavorable socio-economic impact of non-Hodgkin lymphomas (NHL) can be considered as key issues of hemato-oncology. Clinico-hematological patterns of primary NHL of the spleen indicate the need of searching the prognosis factors in order to optimize treatment tactics. The objective of the study was distinguishing of clinical and hematological prognosis factors in aggressive NHL of the spleen. **Methodology:** This analytical, cohort study enrolled 45 patients with primary high-grade (HG) NHL of the spleen, who were treated at the Institute of Oncology from Moldova. The diagnosis was proved

by cytological, histopathological and immunohistochemical examinations. The types of NHL were assessed according to the Revised 2017 WHO Classification of Tumors of Hematopoietic and Lymphoid Tissues. The patients age ranged between 15-82 years (median - 51.9 years). Stage IV NHL was revealed in 38 (84.6%) cases. **Results:** In stage IV NHL with primary involvement of the spleen, the 5-year overall survival (OS) of patients under the age of 50 was 38.5%, above 50 years - 19.8%. The bone marrow (BM) involvement reduced the 5-year OS (24.1%). The average life-span was 23.5 months in cases without leukemic conversion (LC) and 7.4 months in those with LC. When treated with splenectomy and chemotherapy, the 5-year OS attained 47.2%. The 5-year OS accounted 14.0% in stage IV patients treated only with combined therapy. **Conclusion:** The post-splenectomy correction of cytopenias persuaded an increase of the OS (54.5%) in cases with refractory cytopenic syndrome. The stage IV, BM dissemination, leukemic conversion, patients age ≥ 50 years, the unfeasibility of performing splenectomy and the resistance of cytopenias to splenectomy may be suggested as the unfavorable prognostic factors in aggressive NHL with primary involvement of the spleen, which should be taken into account in order to optimize treatment options.

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OP 03

CLINICAL CHARACTERISTICS, AND SURVIVAL RATE OF ELDERLY PATIENTS WITH NON-HODGKIN'S LYMPHOMAS WITH PRIMARY INVOLVEMENT OF PERIPHERAL LYMPH NODES

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Objective: Non-Hodgkin's lymphomas (NHL) are malignant tumors that develop from lymphoid tissue. They are one of the most common malignancies and they represent one of the most complicated problems of oncohematology. The age group that is mostly affected by NHL in the Republic of Moldova is the patients over 60 years, and the disorder in most cases starts in lymph nodes. This study aims to determine the particularities of elderly patients with NHL with primary involvement of peripheral lymph nodes(l/n). **Methodology:** A retrospective study of a group of 78 NHL patients with primary lymph node involvement was performed. The average age of study participants ranged from 60 to 84 years. **Results:** NHL more often developed primarily in the peripheral l/n (84.7%), less frequently in the mediastinal l/n (6.4%) and abdominal l/n(8.9%). Aggressive NHL predominated (59.0%), but indolent NHL also developed quite frequently (41.0%), which were more frequent in cases of primary affection to the cervical l/n (47.4%), inguinal l/n(41.7%), and abdominal l/n (42.9%). The 5-year survival of NHL patients with primary lymph node involvement aged over 60 years was low and amounted to 31.2%; **Conclusion:** NHL occurred more often in the peripheral lymph nodes (84.7%), less frequently in the mediastinum (6.4%), and abdominal lymph nodes (8.9%). The frequency of aggressive NHL was 59.0%. Indolent NHL was diagnosed in 41% of cases. The 5-year survival rate in the study group constitutes 31,2%, lower compared with younger patients treated in the same center.

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OP 04

UPSHOTS IN ANGIOIMMUNOBLASTIC T-CELL LYMPHOMA: ANALYSIS OF T-CELL BRAZIL PROJECT

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Objective: T-cell Brazil Project was designed as an ambispective data collection from January 2015 to December 2022 of previously untreated patients diagnosed with Peripheral T-cell lymphoma (PTCL) or NK/T-cell lymphoma according to the revised WHO 2017 classification in Brazil. The primary and secondary end points were 2-year overall survival (OS) and progression-free survival (PFS). Clinical, treatment and survival data were also correlated. **Methodology:** Twenty centers got approved for the study from the local and national institutional review board and registered their cases only online. OS was calculated from diagnosis date until last seen or death date, whereas PFS until first event, progression / relapse, date of death or last seen. Kaplan-Meier method was applied and a Log-rank test to compare their curves. P-value less than 5% was considered. From a total of 416 patients with PTCL, 46 (11%) were diagnosed as AITL. **Results:** The median age was 65 years (31-82), with 63% males, 94% had advanced-stage disease. All patients received 61% CHOEP, 28% CHOP and 11% CT without anthracycline. 20% of pts were consolidated with autologous transplant (HSCT). There were 19 (41%) deaths, 10 by lymphoma, 8 infections, 1 new neoplasia. With 8-mo median f/u (1-36), OS at 24-mo was 27% and 2-year PFS was 21%. As consolidation, OS was 71% HSCT group vs. 16% no HSCT (P= 0.06) and PFS was 71% vs. 8%, respectively (P= 0.01). **Conclusion:** These analyses are preliminaries but show a poor outcome of AITL in our population. Most patients were treated with anthracycline-containing combination chemotherapy and just 20% received autologous HSCT. A dismal survival was shown for those who did not receive HSCT.

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MYELOMA

OP 05

IMPACT OF BONE MARROW FIBROSIS IN MYELOMA PATIENTS UNDERGONE AUTOLOGOUS STEM CELL TRANSPLANTATION

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Objective: Autologous hematopoetic stem cell transplantation (aHSCT) after high dose chemotherapy is a standard treatment for multiple myeloma (MM) patients. The successful aHSCT depends on collection of sufficient numbers of hematopoietic progenitor stem cells and sustained engraftment following infusion. The aim of the present study is to determine the the impact of bone marrow fibrosis (BMF) on the clinical outcomes of MM patients who underwent aHSCT. **Methodology:** Retrospectively, bone marrow trephine biopsy analyzed in 73 MM patients who were treated with hematopoietic stem cell transplantation (aHSCT) following bortezomib based induction regimen. The BM biopsy samples of all patients were re-evaluated by a single pathologists The patients divided into 4 groups according to fibrosis degree and the correlations in initial characteristic features, therapeutic response, survival, mobilization and engraftment outcomes were reviewed between the groups. **Results:** Comparative analyses revealed that the median apheresis number was found statistically different according to groups (p=0.04). No significance was detected between the fibrozis grade and the number of peripheral blood CD34+ cell collection results and recovery time of neutrophils and platelets. Overall survival and progression free survival were found similar in groups, however relapse of disease was statistically different in patients with fibrosis (p=0.01). **Conclusion:** After induction treatment, a regression was observed in fibrosis grade of patients who had fibrosis at the time of diagnosis. Therefore we suggest to evaluate fibrosis status in all MM patients during each histopathological examination. Difficulties may be experienced during stem cell collection in transplant eligible MM patients with fibrosis at diagnosis. Therefore, we recommend that clinicians should be more careful in these patients during the induction treatment and stem cell mobilization.

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OP 06

INVESTIGATION OF THE QUALIFICATION OF RADIOLOGICAL TECHNIQUES TO DETECT OSTEOLYTIC LESIONS, FRACTURES, AND OSTEOPOROSIS IN MULTIPLE MYELOMA PATIENTS

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Objective: Multiple myeloma(MM) is a malignancy of clonal plasma cells. Osteolytic lesions represent a criterion for symptomatic myeloma and are associated with bone loss, pathological fractures, and osteoporosis. Skeletal surveys with other sophisticated techniques and dual-energy x-ray absorptiometry (DEXA) are used to screen lytic lesions, and bone mineral loss, respectively. Here, we aimed to investigate the detection rate of osteolytic lesions and bone mineral loss by several imaging techniques in MM. **Methodology:** Three-hundred and ten symptomatic MM patients were screened retrospectively. The results of radiological techniques were recorded. The detection rate of osteolytic lesions, fractures, and plasmacytomas by imaging techniques, as well as bone mineral loss with DEXA was recorded. Also, associations with gender, MM type, lytic lesions,

and osteoporosis were investigated. **Results:** Skeletal survey and PET-CT detected lytic lesions in 71.3% and 81.2% of patients, respectively. PET-CT had a sensitivity of 96.1% and specificity of 90.6% to detect lytic lesions. MRI was only used for patients with suspicious fractures and detected them for all patients who underwent MRI. The osteoporosis rate was 83% for 113 patients who underwent DEXA. Any association between lytic lesions and gender or MM type was not detected. **Conclusion:** Our study demonstrated that osteolytic lesions are not correlated with gender or MM type. PET-CT is a sensitive and specific method for detecting osteolytic lesions. Although DEXA is sensitive, its specificity is limited to detect osteoporosis in patients with lytic lesions.

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OP 07

ISATUXIMAB PLUS CARFILZOMIB AND DEXAMETHASONE IN PATIENTS WITH RELAPSED MULTIPLE MYELOMA AND SOFT-TISSUE PLASMACYTOMAS: IKEMA SUBGROUP ANALYSIS

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Objective: Phase 3 IKEMA study (NCT03275285) showed significant improvement in PFS with Isatuximab (Isa) + carfilzomib (K) and dexamethasone (d) vs Kd in patients (pts) with relapsed multiple myeloma (MM) (HR: 0.531; 99% CI: 0.32–0.89; P=0.0007), leading to approval of Isa-Kd in US for adults with MM with 1–3 prior lines and in EU for those with ≥1 prior therapy. This post-hoc analysis evaluated efficacy and safety of Isa-Kd vs Kd in relapsed MM pts with pre-existing soft-tissue plasmacytomas (STP). **Methodology:** Pts (N=302) were randomized (3:2) to Isa-Kd (n=179; 12 had STP) or Kd (n=123; 7 had STP). Doses: Isa: 10 mg/kg IV QW for 4 weeks, then Q2W; K 20 mg/m^2 days 1–2, then 56 mg/m^2 twice-weekly 3 of 4 weeks; d: 20 mg twice-weekly. Independent review committee assessed response based on central radiology review and central lab M-protein using International Myeloma Working Group criteria. Median (range) duration of exposure in STP pts (Isa-Kd vs Kd) was 41.9 (2–87) vs 29.9 (4–83) weeks. **Results:** In STP sub-group, PFS (95% CI) improved in Isa-Kd vs Kd: HR 0.574 (0.125–2.640); median PFS was Isa-Kd: 18.76 months (4.435–not calculable [NC]) vs Kd: NC (0.986–NC). Response rates improved in Isa-Kd vs Kd: overall (50.0% vs 28.6%), ≥VGPR (33.3% vs 14.3%), CR (25.0% vs 0%, all with MRD negativity). TEAE rates (n [%]; Isa-Kd vs Kd) were: Grade ≥3: 12 (100%) vs 4 (57.1%); Grade 5: 2 (16.7%) vs 1 (14.3%); serious: 9 (75.0%) vs 4 (57.1%); discontinuation: 0 (0%) vs 1 (14.3%). **Conclusion:** Baseline characteristics in STP subgroup were similar to overall ITT population, except ISS stages II, III, and renal function impairment, which were more prevalent in STP subgroup vs ITT. Isa-Kd vs Kd improved PFS and depth of response in pts with relapsed MM and STP, with manageable safety profile, consistent with the benefit observed in IKEMA overall population. Isa-Kd is a new treatment option for pts with relapsed MM and STP.

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PLATELET DISEASES

OP 08

OUTCOME OF SPLENECTOMY IN THE TREATMENT OF ITP – ONE CENTER EXPERIENCE

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Objective: Immune thrombocytopenia (ITP) is a disease with variable clinical presentation, requiring different treatment lines. Splenectomy is used as a second- or third-line therapy for ITP. The aim of our study was to evaluate the outcome of splenectomy in the treatment of ITP in our center. **Methodology:** The study included 245 patients aged 18 years and older, diagnosed with ITP, treated at the Department of Haematology of the Jagiellonian University Hospital in Krakow from January 2006 to January 2021. Outcomes of splenectomy were analyzed. **Results:** 14.3%of all ITP patients underwent splenectomy, including 51.5% of those who needed second-line treatment. As much as 60% of them underwent surgery immediately after first-line treatment, while the rest was fist subjected to second-line pharmacological treatment. The mean time from ITP diagnosis to splenectomy was 31.9 months. The mean value of PLT count at

the day of splenectomy was 57.4 × 109/L. The initial response rate was 74.3% and post-splenectomy relapses occurred in 22.9% of cases. **Conclusion:** In our center splenectomy was performed in more than half of the patients within the second-line treatment and resulted in permanent remission of the disease in 50% of cases. It is still a considerable method of ITP treatment, however its frequency decreases over time due to introduction and wider availability of thrombopoietin receptor agonists.

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OTHER DISEASES

OP 09

DIRECT ORAL ANTICOAGULANTS IN SICKLE CELL DISEASE, WHERE WE STAND AND WHERE WE ARE HEADING: A SYSTEMATIC REVIEW

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Objective: The evidence guiding VTE management in SCD, specifically in terms of anticoagulant choice, is scarce. Therefore, we conducted a systematic review that evaluates the effectiveness and safety of direct oral anticoagulants (DOACs) in SCD with VTE. **Methodology:** We performed a systematic review following the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines. We searched the English literature (PubMed, SCOPUS, and Google Scholar) for randomized controlled trials, observational studies, reviews, case series, and case reports for patients with SCD treated with DOAC for thromboembolic disease. **Results:** The current data demonstrated that the use of DOACs for VTE in SCD has similar effectiveness in the prevention of VTE recurrence in comparison to other anticoagulants, including VKAs and injectable anticoagulants with a better safety profile. However, given the absence of clinical practice guidelines for the treatment of VTE among patients with SCD, the clinical practice guidelines recommendations for VTE treatment can be applied to patients with SCD. **Conclusion:** In view of the current evidence and based on the results observed; using DOACs was associated with lesser bleeding incidence and fewer complications comparing to VKAs. We think it is rational to use DOACs for VTE treatment among patients with SCD rather than use VKAs.

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OP 10

ANTI-GLYCAN ANTIBODIES IN THE DIAGNOSIS OF GASTRIC CANCER

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Objective: Gastric cancer (GC) is traditionally considered a difficult disease to diagnose and treat. The search for new markers for GC is an extremely urgent purpose. Previously has been shown, that serum anti-glycan antibodies (AGAT) are very large reservoir of markers which can be reliably detected using an instrument called glycoarray (PGA). A “;signature”; approach, i.e. searching of combinations of diagnostically significant markers – AGAT detected by PGA, is used in this study. **Methodology:** The cohort of the serum of apparently healthy donors from the National Medical Research Center of Oncology (NMRC) (n = 55, 69%/31% - m/f) and previously untreated patients with an established diagnosis of GC I-IV stages from the NMRC (n = 146, 52%/48% - m/f) were collected. To study serum AGATs glycoarray containing 300 different glycans was used. To search for a diagnostic signature, the mathematical apparatus “;Immunoruler”; [Int. J. Bioinformatics Res. Appl., 7, 402-426 (2011)] was applied. **Results:** Using glycoarray IgG and IgM profiles of donors and GC patients were obtained and data quality control has been performed. The mathematical apparatus Immunoruler was applied to the resulting database and a signature was obtained. It includes antibodies to 11 glycans: 7 IgM (directed to KDNb6’LN-C3, b3’SLN, LN-C8, Aa4A, TF, 3’SiaLeC and Tn3Su) and 4 IgG (GN6Su, TF, para-Fs and bGU). The quality of the developed diagnostic approach was assessed: the AUC value was 0.87, and the accuracy was 0.81. **Conclusion:** Thus, the use of glycoarray technology in combination with a mathematical signature search apparatus has made it possible to find a reliable combination of molecular markers for the diagnosis of gastric cancer. Since the tumor can dramatically change as it progresses, the AGAT profile can also change. This opens up the possibility for a differentiated diagnosis of GC depending on the stage of the disease and, first of all, to develop early diagnosis of this disease.

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OP 11

THE IMPACT OF HEMATOLOGICAL PARAMETERS ON SURVIVAL FOR PATIENTS WITH COVID-19

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Objective: Coronavirus disease 2019 is an infectious disease caused by the novel severe acute respiratory syndrome

coronavirus 2 (SARS-CoV-2). Clinical and laboratory predictors may identification of patients at risk of mortality and guide treatment .To analyze laboratory abnormalities in patients with COVID-19 and define which parameters affect mortality and hospitalization **Methodology:** This retrospective study was conducted on 101 patients diagnosed with COVID-19. Demographic characteristics, laboratory parameters including complete blood count (CBC) parameters, biochemical tests, coagulation parameters, duration of hospitalization and final status (discharge or death) were recorded **Results:** Comparisons were made of survivors and non-survivors at the end of follow up period. Multivariate analysis showed mean platelet volume (MPV), platelet distribution width (PDW) and lactate dehydrogenase (LDH) to be significant predictors of mortality. The cut-off value of the hospitalization period was found to be 10 days, so patients were divided into two groups. In the multivariate models, no significant independent parameter was observed for the prediction of hospitalization duration. **Conclusion:** The results of the current study demonstrated that MPV, PDW and LDH were significant independent variables for the prediction of mortality. As SARS-CoV and SARS-CoV-2 are known to use the same receptor, there may be a similar structure and receptor for mutant variants and the first variant, so these predictive parameters can be considered to be as effective in mutant variants.

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OP 12

AN UNUSUAL SURVIVING HISTORY: MULTISYSTEM INVOLVEMENT UNTIL ADULT LIFE WITH NIEMANN PICK TYPE B

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Objective: Niemann-Pick disease (NPD) occurs with the storage of lipids including sphingomyelin and cholesterol due to acid sphyngomyelinase deficiency. Based on genetic cause and clinical picture NPD are divided in four main types. The type B is called as non-neuronopathic variant in which many patients may survive several decades. Infiltration by lipid-laden foam cells of tissues contribute to life-threatening complications. We here present a case who has been diagnosed as having NPD in the adulthood. **Case report:** A 46-year-old male patient with peripheral edema and dyspnea and abdominal distention was investigated. He has a medical history of aortic and tricuspid valve regurgitation with severe pulmonary hypertansion, decreased ejection fraction as 35% and acsending aort aneurism on 30 years old. He experienced three years later ascending aortic replacement and aortic valve replacement. He developed dyspnea, bleeding gums, and alveolar hemorrhage was diagnosed on 40s. **Methodology:** Pancytopenia associated massive splenomegaly and hepatomegaly contibute reassessment of the disease. Bone marrow revealed moderate hypercellularity T lymphocytosis, focal mild dysplasic changes, and mild reticulin fiber increase. No cytogenetic abnormality and PNH clone was detected. He had developed congestive heart failure and massive proteinuria. Also he had medically controlled hyperlipidemia and interstitial lung disease. **Results:** A storage disease investigation was started. Plasma Chitotriosidase was found to be increased and leukocyte sphingomyelinase activity was decreased. A genetic screening for NPD revealed homozygote (SMPD1 p.V36A (c.107T> C) (rs1050228) and heterozygote G508R (c.1522G> A) (rs1050239).NPD type was diagnosed with probable kidney involevement and cardiac cirrhosis. Supportive treatment was decided. He succumbed in a short time on sepsis atack unfortunetaly. **Conclusion:** NPD type B is a rare storage disease. It is a multisystemic disease characterized by its clinical variability and could be overlooked until adulthood life with various differential diagnosis option. It should be considered.

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OP 13

LEWIS C IN BREAST CANCER PROGRESSION

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ФГБУЗ МСЧ 174 ФМБА

Case report: Lewis C in breast cancer progressionN.A.Gadetskaya1, N.N.Tupitsyn2, N.V.Bovin3, Udalova Ya.A.11At the moment of receiving these data - FSBU “Blokhin national cancer research center” of the Russian Ministry of Health, Moscow, Russia2FSBU “Blokhin national cancer research center” of the Russian Ministry of Health, Moscow, Russia3Yu.A. Ovchinnicov and M.M.Shemiakin Institute of Bio-organic chemistry of Russian Academy of Sciences, Moscow, RussiaExact evidences on the role of natural IgM antibodies in antitumor immune surveillance were proved by German team of scientists (Vollmers H.P. et al.) Binding of those antibodies to tumor cells leads in many cases to malignant cell death via lipoapoptosis. In 1994, P.D. Rye & R.A. Walker produced monoclonal IgM antibody LU-BCRU-G7 against breast cancer-associated glycoprotein. In early breast cancer, expression of this marker was seen in a group of patients with poor prognosis. Antibody recognized disaccharide Galβ1- 3GlcNAc or LewisC (LeC), blood group H1-antigen precursor. We have studied glycan expression on tumor cells and antiglycan antibodies in more than 240 breast cancer patients. Immunohistochemical study in 89 cases of early breast cancer (pT1- 2 N0 M0) revealed antigen expression in 57% of cases. Expression of LeC was significantly more frequent in tumors of larger sizes (> 3 cm): 85,0% vs 48,5% (p=0,004). Expression of LeC was much more frequent in breast cancers in which lung metastases were noticed in patient’s follow up (more than 1 year) after operation (p=0,047). In LeC positive cases shorter ($p < 0,1$) DFS (disease-free survival) was noted, differences in DFS being near significant ($p = 0,05$) in malignancy grade 3 and in moderate or prominent lymphoid infiltration (p=0,02), as well as long (> 4 years) patient’s follow up. That data confirmed the note of Rye and Walker on poor prognosis of early LeC-positive breast cancer. In 67% of breast cancer patients small

proportion of peripheral blood B-lymphocytes (up to 0,9% of B-cells) specifically bound LeC, i.e. expressed B-cell receptor for LeC. Up to 50% of these B-cells expressed CD5, so belonged to B1-natural immunity branch. Serum levels of antibodies to LeC were significantly higher in healthy woman then in breast cancer patients. Opposite relations between anti- LeC and serum levels of CA 15.3 were noticed. Membrane expression of LeC on breast cancer cells was confirmed by flow cytometry. In 36% cases patient's tumor cells were LeC -positive with low concentrations or absence of anti- LeC in sera. The last group of patients seem to be perspective in study of anti- LeC adoptive therapy approach. In conclusion. Lewis C blood group antigen expression takes place in 57% of early breast cancer, associated with poorer prognosis. Levels of anti- LeC in breast cancer patients are lower than in healthy woman, in 36% of LeC-positive cases being almost no detectable. Taking in mind important role of natural IgM antiglycan's in cancer surveillance, it seems perspective to study in this well characterized group of breast cancer patients some anti-LeC adoptive therapy to see if compensation of anti- LeC immune deficiency can be beneficial for patients.

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OP 14

B1-CELLS OF INNATE IMMUNITY IN THE BONE MARROW IN BREAST CANCER PATIENTS: IDENTIFICATION AND THEIR RELATIONSHIP WITH CLINICAL AND MORPHOLOGICAL PARAMETERS

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Objective: In recent years more attention has been paid to the study of the innate immune system, which includes B1-lymphocytes. They produce pentameric M antibodies, which play an important role in the induction of apoptosis in tumor cells. The study of lymphocyte populations can help to reveal the phenomenon of persistence of disseminated tumor cells in the bone marrow (BM) of breast cancer (BC) patients. **Methodology:** This study included BM punctuates from 64 BC patients and 10 women with benign processes. The study was carried out by two methods: morphological and immunological. Calculation of the myelogram under light microscopy was performed by two expert morphologists. Multiparameter flow cytometry (FACSCanto II cytometer) has been used to assess the populations of BM lymphocytes. Antibodies CD20, CD5, CD19, CD38, CD22, CD45 were used. **Results:** The content of B1 (CD5+) cells is higher in luminal B-Her2 "+" BC, than with B-Her2 "-": 10.2% (n=10) versus 4.0% (n=20), p=0.032. The highest levels of B1-cells were observed in stage IIA (12.4±10.7%), also with 2 affected lymph nodes and their maximum size: 16.0±10.2% (n=5) and 5.8±1.6% (n=29), p=0.07. The content of B1-cells correlated with eosinophilic myelocytes (R=0.365; p=0.011; n=48), plasma cells (R=0.409; p=0.004; n=48) in BC. **Conclusion:** The determination of the level of B1-lymphocytes in the BM can serve as an additional marker of the molecular subtype of BC. It is described that an increase in the content of plasma cells takes place with DTC in the bone marrow. Based on this it can be assumed an increase in the level of B1-lymphocytes is associated with a high probability of metastases in the BM.

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PEDIATRIC HEMATOLOGY ABSTRACT CATEGORIES

COAGULATION AND FIBRINOLYSIS DISORDERS

OP 15

COMPARISON OF INDIVIDUAL PHARMACOKINETIC DOSING TOOLS IN PATIENTS WITH HEMOPHILIA A

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Objective: Prophylaxis treatment is recommended for the prevention of bleeding and complications in patients with hemophilia A. Personalized treatment methods are an up-to-date approach. Hemophilia treatment is suitable for optimization with pharmacokinetic (PK) methods. It has been shown that prophylaxis regulated with PK data reduces the frequency of bleeding and the cost of treatment. To determine the best prophylaxis regimen, PK dose tools using the Bayesian method have been developed. **Methodology:** Blood samples were obtained from 42 patients with severe hemophilia A (median age 13.4 years) with factor VIII (FVIII) inhibitor <0.6 BU/ml and no additional disease that would affect the FVIII level before the FVIII infusion, 4, 24 and 48 hours after the infusion. FVIII levels from blood samples were measured by PTT-based one-stage assay method. PK parameters obtained using WAPPS and myPKFIT programs, which are two web-accessed PK dosing tools using the Bayesian algorithm, were compared. **Results:** There was no significant difference between the daily dose of FVIII given in prophylaxis and the dose amount recommended by the myPKFIT program for the 1% trough, but a difference was found with the WAPPS program. While there was no significant difference between the half-lives (t1/2) and the time to 5% of plasma FVIII between the two PK tools, there were significant differences in the recommended dose amounts, clearance (CL), times up to 1% and 2% of plasma FVIII. **Conclusion:** As a result of cross-pair comparison between the treatment doses received by the patients and the doses recommended by the PK dosing tools, significant differences were found as well as similarities.

Besides similar results, significant differences were also found among the PK parameters. Previous studies didn't compare CLs between myPKFIT and WAPPS, this is the first in our study. While no difference was found between t1/2's, the difference between recommended doses may be due to CL difference.

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PLATELET DISORDERS / THROMBOSIS AND ANTITHROMBOTIC THERAPY

OP 16

IMMUNE THROMBOCYTOPENIA PURPURA FLARE POST SARS-COV-2 VACCINATION

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Case report: The main strategy to control the SARS-CoV-2 pandemic is through global vaccination. One of the rare side effects of vaccination is Immune Thrombocytopenic Purpura (ITP). We present a 31 years old lady with a history of ITP, came on her 8th week of pregnancy with fever and dry cough after receiving the first dose of Pfizer vaccine. The ITP flare worsened after the second dose of the vaccine. Patients with ITP should have their second dose of vaccine delayed if they had flare particularly if pregnant.

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OP 17

THE OUTCOME OF IMMUNE THROMBOCYTOPENIC PURPURA IN CHILDHOOD AND THE RISK FACTORS FOR CHRONICITY

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Objective: Immune thrombocytopenic purpura (ITP) is the most common cause of pediatric thrombocytopenia. It is usually a self-limiting disease; however, 20-30% of cases become chronic. In this study, we aimed to investigate pediatric ITP cases' outcomes and whether there are any factors affecting chronicity. **Methodology:** We analyzed retrospectively our 184 newly diagnosed pediatric ITP cases. Thrombocytopenia was defined as chronic ITP if it persists after 12 months. We evaluated the role of clinical and laboratory findings of patients and treatment modalities in the chronicity of ITP. **Results:** The mean age of patients was 5.4 ± 4.75 years at diagnosis. As first-line treatment, 87 (47.3%) of patients were given Intravenous Immune Globulin, 65 (35.3%) of patients were given methylprednisolone, and 32 (17.4%) of patients were followed without any medication. Chronic ITP developed in 39 patients (21.1%). Chronic ITP development rate was 20.19% in boys and 22.5% in girls (p=0.7). While the chronicity rate was 7.02% in children younger than two years old and 17.81% in children between 2 and 6 years, it was 42.59% in children older than six years old (p<0.0001). Mean hemoglobin and absolute lymphocyte count were significantly lower in chronic ITP patients in the 2-6 years age group. (p=0.014 and p=0.048, respectively). The first-line treatment choice had no important effect on chronicity (p=0.61). **Conclusion:** Our results suggest that the most critical factor in developing chronic ITP was the age at diagnosis. Low lymphocyte counts at diagnosis may be associated with a high chronicity ratio.

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RED BLOOD CELL DISORDERS

OP 18

CLINICAL AND LABORATORY EVALUATION OF OUR PATIENTS WITH HEREDITARY SPHEROCYTOSIS

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Objective: Hereditary spherocytosis (HS) is a non-immune hemolytic anemia occurring with anemia, jaundice, splenomegaly symptoms in which the cell membrane of the erythrocytes is transformed into the shape of spherocytes due to congenital membrane protein defects. In this study, the demographic characteristics, clinical and laboratory findings, as well as complications during the follow up of our patients with HS are presented. **Methodology:** All patients who were diagnosed with hereditary spherocytosis and followed in our pediatric hematology clinic between 2000 and 2021 years were included in the study. Gender, age consanguinity of the parents, family history of HS and splenectomy, the neonatal phototherapy history were retrospectively recorded from patients' files. The complaints, physical examination findings, and laboratory findings at the first admission were evaluated. Duration of follow-up, transfusion frequency,splenectomy requirement, and response to splenectomy were also recorded. **Results:** Sixty-seven patients (41 male, 27 female) were religible for the study. The median age of diagnosis was 3 years (range 18 day-15 years). Consanguineous marriage rate was 29.9% whereas 62.7% of the patients had a family history of HS. Neonatal hyperbilirubinemia was present in 67.1% of the patients. The median follow-up period was 8.5 years.The complaints at admission were jaundice (64.2 %), fatigue (26.9 %) and fainting (7.5 %). Physical examination revealed hepatomegaly and splenomegaly in 65.6% and 77.6% of the patients, respectively. Hemoglobin mean values at the time of the admission was 8.3± 2.1 g/dl, ranging between 5.1-15.3 g/dl. The mean MCV value was 83.1±9.7fl, mean value of MCH was 28.8±2.9 pg, mean MCHC value was 34.9±1.6 g/l, mean indirect bilirubin was 3.5 ± 4 mg/dl. There were various degrees of spherocytosis observed in peripheral smear examinations in all patients. Incubated osmotic fragility test confirmed the diagnosis in all cases.

During follow-up, 24 patients (35.8%) never needed a transfusion; 10 (14.9%) patients had an increased need for transfusion in infection periods; eight patients (12%) were regularly transfused, other 25 patients were transfused one or two times, not regularly. 29 (43.2%) had a splenectomy, 41% of the patients who had a splenectomy had a simultaneous cholecystectomy because of the bile sludge and gallstones identified in the ultrasound. Laboratory findings of the patients were also evaluated before splenectomy and two months after splenectomy. Hemoglobin and platelet levels increased significantly ($p<0.01$), and indirect bilirubin levels significantly decreased ($p<0.01$), but no significant difference was found in MCHC levels ($p=0.648$) Splenectomy halted transfusion dependency in 96% of patients. **Conclusion:** HS is a relatively benign form of hemolytic anemia during childhood. Despite high frequency of consangineuous marriage, familial history of HS, and neonatal hyperbilirubinemia in our cohort, most of the patients were diagnosed relatively late, around three years. This finding indicate to underrecognition of HS in primary care. One-thirds of the patients have mild disease and they can be managed conservatively. Splenectomy, in selected cases, may provide clear increase in hemoglobin levels, and decrease in transfusion need.

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OP 19

ASSESSMENT OF THE NUTRITIONAL STATUS, BONE MINERALIZATION AND ANTHROPOMETRICS OF CHILDREN WITH THALASSEMIA MAJOR

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Objective: Children with thalassemia major are prone to growth failure and micronutrient deficiency. In this study, we aimed to evaluate nutritional status, anthropometrics, bone mineralization defects in regularly transfused patients. **Methodology:** We analyzed the data obtained by evaluating laboratory tests, anthropometric measures, and bone mineral density. **Results:** Twenty-nine patients (62% male, 38% female) with mean age 12.26±4.74 years, mean pre-transfusion hemoglobin 8.64± 1.01 g/dl, mean serum ferritin 1158.6±556.8 ng/ml were included. Vitamin D (72.4%), selenium (72.4%), folate (37.9%) deficiencies were the most frequent ones. In 17.2% hypocalcemia, 3.5% hypomagnesemia, in 10.3 % decreased ceruloplasmin were observed. Folate was higher between 2≤ and<6 years (p:0.028). Ceruloplasmin was higher between 6≤ and<10 years (p:0.018). Selenium was significantly higher in patients with ferritin ≥1500 (p=0.008). No significant ferritin-related differences were found in other micronutrients (p>0.05)For body mass index (BMI) 31% were under the 5th percentile, none was over the 95th percentile. For height, 24.5%, for weight 20.7% were under the 3rd, none was over 97th percentile. BMI of patients 10≤age≤18 years old was significantly higher (p=0.001). Anthropometric percentiles did not differ significantly in terms of mean serum ferritin and micronutrient levels. Hypoparathyroidism was observed in 13.8%, hypothyroidism in 3.5% of the patients. Low bone density was detected in 14.8% (2 osteopenic, 2 osteoporotic) patients. Bone mineral density did not differ significantly in terms of ferritin and micronutrient levels. **Conclusions:** Nutritional support and prevention of deficiencies are important to minimize the burden of complications, to increase the life expectancy and quality in TM patients.

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OP 20

ANEMIA AND DIETARY BEHAVIORS AMONG YOUNG ADULTS IN RIYADH, SAUDI ARABIA

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Objective: The study sought to assess the prevalence and the risk factors associated with anemia among male and female young adults in (Riyadh city, Saudi Arabia): Our study population showed a higher percentage of men as compared to women participants. About half of our study sample had a lightly active lifestyle, and more than one-third of the study participants were overweight (34.7%). The average age of the respondents was 22.08 ± 1.98 years. **Methodology:** A cross-sectional study was conducted at King Saud University and Alfaisal University in September 2016 among young adults aged 18 to 28 years old. Data were collected using an interview questionnaire. Additionally, the respondents were evaluated clinically and via laboratory testing for anemia.The only factor significantly associated with anemia was gender, in that female gender showed a positive association with anemia. **Results:** The most specific risk for anemia among Saudi individuals of college and young professional ages (18–28 years old) was the female gender. The dietary lifestyle, heavy menstruation, pregnancy, and NSAID use were important risk factors; however, they were not statistically significant. **Conclusion:** Public awareness about anemia is important including regarding improving dietary behaviors and taking iron supplementation for prevention in high-risk people. Additionally, NSAIDs should be used with caution.

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IMMUNODEFICIENCIES / NEUTROPHIL DISEASES

OP 21

THE EVALUATION OF CONGENITAL NEUTROPENIA PATIENTS

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Objective: Congenital neutropenia is a rare disorder. The survival and quality of lives of these patients were improved with avoidance of infections, GCSF usage and appropriate usage of antibiotics in infections. In this study, the precautions for infections and the treatment compliance, the level of knowledge about the disease and the reasons that may affect the different behavior and compliance in our patients and caregivers were planned to be determined. **Case report:** Questionnaires prepared in order to determine how the social, cultural and economic conditions of the families of children with Congenital Neutropenia could affect their behavior and knowledge levels were filled in one-on-one video interviews with the caregivers. **Methodology:** Behaviors and attitudes of families were questioned, their level of knowledge about the disease was evaluated with a system defined over 40 points, and they were evaluated as very good (40-35), good (34-30), moderate (29-25), bad (25-20) and very bad (<19). The economic status of the families was classified by income perception. The relationship between the sociocultural economic status of the families and their knowledge and attitudes about the disease were evaluated. **Results:** 31 patients and 25 families were enrolled in the study. Genetic tests were performed to all patients and 70.1% homozygote HAX1 and 16.1% ELANE mutation was found. GCSF treatment was started to 96.8%. Consanguineous marriage was defined in 77.3% of families. When families were classified according to their level of knowledge about congenital neutropenia, 8% (n= 2) very good, 40% (n=10) good; 36% (n=9) moderate, 8% bad (n=2) and 8% very bad (n=2) knowledge were determined. **Conclusion:** Congenital neutropenia is a rare disorder. HAX 1 mutation is the most common mutation in our country. The more knowledge of patients and caregivers about the disease and general approach cause improvement in the quality of life and survival of these patients. It is necessary to prepare tests that will enable to assess the disease knowledge level and quality of life scales developed for these patients.

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OP 22

MANAGEMENT AND OUTCOMES OF NEUTROPENIA IN PREVIOUSLY HEALTHY CHILDREN

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Objective: Immun-component children with moderate neutropenia do not have an increased risk for severe bacterial infections. However, there is limited data for the management of benign neutropenia in children. Therefore, we aimed to determine the most common etiology and outcomes in children with neutropenia. In addition, we compare the laboratory findings of different severity levels (neutrophil levels $<0.2 \times 10^3$/mL, 0.2×10^3-0.5×10^3/mL, 0.5×10^3- 1×10^3/mL, 1×10^3- 1.5×10^3/mL). **Methodology:** This retrospective study included children with neutropenia (neutrophil $< 1.5 \times 10^3$/mL) diagnosed between December 2019-November 2020 in a tertiary hospital. The patients aged between one month-eighteen year had no history of chronic disease, immunosuppressive therapy, malignancy, or drug administration. Ministry of Health's ethics committee approved the study. We evaluated the etiologies and compared age, sex, time of follow-up, duration of neutropenia, thrombocyte, monocyte and immunglobulin levels of neutrophil levels ($<0.2 \times 10^3$/mL, 0.2×10^3-0.5×10^3/mL, 0.5×10^3- 1×10^3/mL, 1×10^3- 1.5×10^3/mL). **Results:** The most common etiology was acute neutropenia (81.5%) and infections (66%). Five (2.5%) had coronavirus disease. Chronic and autoimmune neutropenia are the most common in chronic neutropenia. Lower neutrophils are associated with prolonged neutropenia (p=0.003), higher monocyte (0.03), higher IgM levels (0.038), younger ages (p<0.001), higher IgG (p=0.002) levels. Sex, time of follow-up, thrombocyte levels, total IgE levels are similar in children with different neutrophil counts. **Conclusion:** Our study demonstrates the etiology in children with neutropenia. The most common etiology is acute neutropenia with infections. In SARS-CoV2 diseases, neutropenia is less common than other hematologic findings. However, we detected in two point five percent of all. Unknown etiologies are also seen in the acute setting. Immun neutropenia and chronic idiopathic neutropenia are the leading causes of chronic cases. IgM levels were higher than the standard ranges in the agranulocytosis group, with a mean age of 1,05 ± 0,80. Therefore, children with ages of one-two should be carefully checked and followed for immunodeficiencies.

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LEUKEMIA

OP 23

POST-TREATMENT NUTRITIONAL STATUS OF CHILDREN WITH ACUTE LYMPHOBLASTIC LEUKEMIA

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Objective: In this study, we aimed to investigate the nutritional status after treatment in pediatric patients who have completed treatment with the diagnosis of acute lymphoblastic leukemia. **Methodology:** We analyzed the data obtained by evaluating patients' answers to the questionnaire consisting of questions containing a Likert scale, laboratory tests, and anthropometric measures. **Results:** Forty-one patients (22 male, 19 female) aged between four and 19 years with a mean age of 11.98 ±3.74 years were included. Mean body mass index (BMI) was 66.31±33.06 percentile, mean bone age was12.16± 3.99 years. In 40 patients under the age of 19 years, one patient (2.5%) was underweight, 23 patients (57.5%) were normal, six patients (15%) were overweight, six patients were (15%) obese, four patients (10%) were extremely obese. There was no statistically significant difference between the genders in terms of BMI (p:0.828). Of the 41 patients, 73.2% stated that their eating habits changed negatively after the treatment was completed, 2.4% used nutritional supplements,

4.9% used herbal medicine. 17.1% of the patients consumed two meals/day a day, 70.7% three meals/day, 7.3% meals/day, 4.9% 4≤ meals/day; 34.1% were fed mostly with carbohydrates, 7.3% mostly with protein, 17.1% with mostly fat-containing food, 4.9% with mostly processed food and 36.6% were fed with a balanced diet. In their daily diets, 51.2% of the patients consumed processed food, and 48.8% did not consume any processed food. Of the patients, 80.5% were not involved in any kind of sports activity. 14.6% of patients stated that they spend > 5 hours/day, 12.2% 3-5 hours/day, 70.7% 1-3 hours/day, and 2.4% < one hour/day in front of a screen. In 73.2% of patients' vitamin D level was <12 ng/mL and in 26.8% between 12 and 20, ng/mL. In 19.5% vitamin B12 level was < 200 pg/mL. Selenium deficiency was detected in 12.2%, zinc deficiency in 29.3%, vitamin C deficiency in 12.2%. **Conclusion:** Nutritional disturbances are not uncommon in survivors of pediatric acute lymphoblastic leukemia. It is important to closely monitor and raise awareness of these children in terms of unbalanced nutrition, inactivity, and the development of a tendency to gain weight.

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OP 24

ACUTE MEGACARYOBLASTIC LEUKEMIA IN CHILDREN: DIAGNOSTICS AND MRD MONITORING

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Objective: Acute megakaryoblastic leukemia (AMKL) is a rare subtype of acute myeloid leukemia (AML) associated with poor prognosis for all patients except children with t(1;22) or Down syndrome. The frequency of complete remission in case of AMKL is comparable to the frequency of it in other variants of AML but the median survival is much lower. This determines the necessity of more thorough evaluation of treatment effect using flow cytometry accessment of minimal residual disease (MRD). **Methodology:** The clinical and immunological profile of 8 girls and 9 boys with de novo AMKL between the ages of 3 months–11 years old was analyzed. The primary leucocytosis median was 10,25; only one patient had hyperleukocytosis (53x109/l) at presentation. The measurement of MRD was performed in 6 patients using multiparameter flow cytometry. The measurement of MRD performed after induction therapy on the basis of megakaryocytic markers, weak CD45 expression using the initial iimmunophenotype patterns. **Results:** Adequate measurement of the level of MRD had required extensive diagnostic immunophenotyping in order to determine the aberration of megakaryoblasts. CD9(83,3%), CD33(75%), CD34(60%), CD13(50%) apart from megakaryocyte markers (100%) were most common for blast cells in case of AMKL. The expression of CD7 antigen was as frequent as of CD117-40%. The MRD level ranged from completely negative (0%; 0.006%) to evident (1.05%). **Conclusion:** The detection of residual tumor megakaryoblasts in AML M7 using flow cytometry is a promising method for assessing the effect of therapy. Adequate measurement of MRD requires detailed immunophenotyping in the diagnosis to determine the aberrations of megacaryoblasts immunophenotype.

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OP 25

JUVENILE MYELOMONOCYTIC LEUKEMIA SINGLE CENTER EXPERIENCE

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Objective: In the 5-year follow-up of patients diagnosed with Juvenile Myelomonocytic Leukemia (JMML) in a single center; reveal treatment and survival analyzes **Methodology:** In this study, clinical and laboratory data of 12 JMML patients followed in Ankara Pediatric Hematology Hospital and Ankara City Hospital Pediatric Hematology Clinics between 2015-2020 were analyzed retrospectively. **Results:** The median age at diagnosis was 1.7 years (0.23-5.7). Monosomy 7, 4 PTPN11, 2 NRAS, 4 KRAS, 1 CBL mutations were detected in 2 of the patients. Hematopoietic stem cell transplantation was performed in 8 of the patients. Before transplantation, 7 patients had received a median of 4 cycles of azacitidine treatment. The mean time from diagnosis to transplantation was 15 months (1-29 months). The 5-year overall survival at median 15-month follow-up was 50%. **Conclusion:** With hypomethylating agents and HSCT, survival in JMML improves compared to historical control groups. However, further multicenter prospective studies are needed to prevent long-term mortality and morbidity.

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OP 26

MYSTERY OF iAMP

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Objective: Intrachromosomal amplification of chromosome 21 (iAMP21) is defined as the presence of three or more RUNX1 signals on a single chromosome, or a total of five or more RUNX1 signals per cell. It occurs in 2% of pediatric B-cell

acute lymphoblastic leukemia (ALL), but is associated with older age, low white blood cell count, and high risk of relapse. In our study, it was aimed to review our patients with ALL in terms of possible iAMP21 at the time of diagnosis and to evaluate the clinical features. **Methodology:** The results of the patients who were diagnosed with B-cell ALL between 2012 and 2019 and whose treatment was completed, and whose signal increase in the RUNX1 region in the t(12;21) FISH analysis were detected, were reviewed together with the medical genetics section in terms of possible i amp. Those with 5 or more signal increases on a single gene in RUNX1 were considered as i amp. **Results:** In the t(12;21) FISH analysis, signal increases were observed in the RUNX 1 region in 15 (8.3%) of 180 B-cell ALL patients included in the study. Although these signal increases varied between 3-4 in 14 patients, 4-7 signal increases were detected in only 1 patient and were considered as iamp. The patient with iamp was a 6-year-old patient with a white blood cell count of 7600/mm3 at presentation and followed in the intermediate risk group. . Bone marrow relapse developed in 2 years. **Conclusion:** The presence of iAMP21 is associated with a delay in treatment response and increased recurrence in the late period. Patients should be carefully evaluated for iAMP21.

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MYELODYSPLASTIC SYNDROMES

OP 27

DIAGNOSTIC APPLICATION AND CLINICAL SIGNIFICANCE OF FCM WELLS SCORING SYSTEM IN MYELODYSPLASTIC SYNDROMES

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Objective: Myelodysplastic syndromes (MDS) are group of clonal diseases of the hematopoietic system characterized by ineffective hematopoiesis, dysmyelopoiesis, a high frequency karyotype abnormalities and the risk of transformation into acute leukemias. Cytopenic and dysplastic changes are not pathognomonic for MDS, and there are many diseases that can imitate MDS. According to various sources, clonal karyotypic abnormalities are present only in 20-60% of MDS. The diagnosis of MDS is not difficult if blasts or sideroblasts are present in the bone marrow, or there are chromosomal aberrations as evidence of clonal hematopoiesis. The diagnostic problem arises in cases of MDS without sideroblasts, with normal karyotype and/or bone marrow hypoplasia. Since 2012, the ELNet Working Group has proposed and subsequently supplemented guidelines for Flow Cytometry as a complementary diagnostic tool. The aim of the study was to compare the results of the FCM Wells score MDS with the results of the İPSS-R score MDS **Methodology:** The study included 30 patients initially diagnosed with MDS . The classification was carried out according to the WHO Classification of MDS 2016: MDS SLD-6 (20%), MDS-MLD-5 (16.7%), MDS RS-MLD-2 (6.7%), MDS-EB1-9 (30%), MDS EB2-8(27%). According to the IPPS-R, patients were scored based on blasts, cytogenetic examination, hemoglobin/platelet/absolute neutrophil count and scored as very-low, low, intermediate, high, very-high. **Results:** Using the Wells evaluation criteria, which takes into account cytometric analysis of the cells of the main myelopoiesis lines, changes were found in the compartment of granulocytes in 93%, monocytes in 40% and erythrocytes in 73% of cases. High scores on the Wells scale (> 4) were obtained in 89% of (8/9) MDS-EB1, 100%(8/8) MDS-EB2, 80% (4/5) MDS MLD patients, 17% (1/6) MDS −SLD, 50%(1/2) MDS RS-MLD. According to IPPS-R, MDS patients received a score <1.5 very low risk group include 50%(3/6) MDS −SLD, 20%(1/5) MDS-MLD, score > 1.5-3 - Low risk group include MDS −SLD 50%(3/ 6), MDS-MLD-80% (4/5), MDS RS-MLD 50% (1/2), MDS-EB1-78%(7/ 9), score > 3- 4.5-intermediate risk qroup got MDS-EB1 22%(2/ 9), MDS EB2-25% (2/8), MDS RS-MLD- 50%(1/2), Score > 4.5 respectively high risk group got patients MDS −SLD- 17%(1/6), MDS EB2-50%(4/8), Score > 6 very high risk group got MDS EB2- 25%(2/8). The Pearson's correlation coefficient (PCC) showed high correlation between İPSS-R and FCM Wells score was 0.83, p<0.002. **Conclusion:** In our study, the FCM score had a positive correlation with the IPSS-R prediction. Expanded analysis of the main compartments of the bone marrow (early precursors of myelopoiesis, the population of granulocytes and monocytes, erythrocytes) using the Wells scale as an additional tool improves the diagnosis and distinguish low-grade MDS from non-clonal cytopenias.

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HEMOGLOBINOPATHIES (SICKLE CELL DISEASE, THALASSEMIA ETC. . .)

OP 28

THE FREQUENCY OF HLA-A, B AND DRB1 ALLELES IN PATIENTS WITH BETA THALASSEMIA

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Objective: HLA class I and II alleles are shown to be associated with certain diseases. A restricted numbers of alleles were found to be related to alloimmunisation in thalassemia population. The role of human leucocyte antigens in thalassemia is trend topic. In this study, the aim was to evaluate the differences in HLA frequencies of beta thalassemia patients comparing with healthy controls. **Methodology:** The data were collected of 100 patients who were diagnosed with beta thalassemia and 100 healthy controls were included in the study. The low resolution HLA-A, -B, -DRB1, tissue group data were performed Istanbul University, Faculty of Medicine, Medical

Biology Department HLA typing laboratory. All data were analyzed retrospectively and their HLA allele frequencies were analyzed by SPSS (v22) program. **Results:** We found an increased frequency of HLA-B*14 (8% versus 2%) and HLA-B*52 (17% versus 2%) compared to the control group (p=0.05, OR=4.26; p<0.01, OR=10.03). On the other hand, HLA-B*13 frequency was decreased in thalassemia patients (5% versus 13%, p=0.04, OR=0.35). Other HLA-A, -B and -DRB1 allele frequency was similar with healthy controls. **Conclusion:** Our results showed that HLA-B*14 and -B*52 allele were associated with beta thalassemia in Turkish population. Several studies found that HLA-DRB1*15 and DRB1*11 were associated with alloimmunisation in thalassemia. Other some studies showed DRB1*07 and chronic infection relation in patients with thalassemia. We found HLA-B certain alleles difference in thalassemia patients which may yield a challenge in finding the matched donor in our population.

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OP 29

AVASCULAR NECROSIS OF HIP JOINT IN ADOLESCENT AND YOUNG ADULT SICKLE CELL PATIENTS WITH CLINICAL AND RADIOLOGICAL ASPECTS

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Objective: Sickle cell anemia is inherited as autosomal fashion and seen mostly as a result of consanguineous marriages in endemic regions. In the clinical perspective the concept of anemia is dominated by symptoms and complications other than anemia. Here, hip joint avascular necrosis, which is one of the most important chronic complications seen in sickle cell patients in terms of morbidity, will be discussed with radiological and demographic clinical associations. **Case report:** Forty-three sickle cell anemia patients were included in our study, including the young adult age group of 12 years and after, which is the age of onset of adolescence. In this patient group, different degrees of avascular necrosis of the femoral head were detected in 22 patients, and they were classified by different grading methods and compared with the main demographic data. **Methodology:** 22 patients had either unilateral or bilateral avascular necrosis and 21 of 43 patients did not have avascular necrosis. While 17 patients had avascular necrosis on the left, 15 patients had avascular necrosis on the right. Avascular Necrosis of the bilateral hip joint was detected in 10 patients. In the evaluation performed in the patient group, bone infarction in the femur was evaluated in the presence or absence of avascular necrosis and bone infarction was found. The number of bone infarcts accompanying patients with avascular necrosis was 18. Approximately 90 percent of them were receiving hydroxyurea treatment and they were not under chronic transfusion therapy. **Results:** The incidence of bone infarction was significantly higher in patients with positive HIP AVN ($p < 0.001$; $p < 0.05$). It was found that patients with positive bone infarction had lower MCV values ($p = 0.036$, $p < 0.05$). No statistically significant difference was found between the hip avn (+) patient group and the hip avn (-) patient group in terms of mean age, Hb mean, bk mean, plt mean, Hb S mean, Hb F mean and blood transfusion. The same values ((mean age, presence of bone infarction, hydria doses (1,2 and 3 separately for users), hb mean, bk mean, plt mean, mcv mean, hbs mean, hbf mean and blood draw)) R Ficat and Arlet stages (stage 0,1,2,3,4), R Steinberg stages (stage 0, 1A, 1B, 1C, 2A, 2B, 2C, 3A, 3B, 3C), R Mitchell stages (A, B, C , D, C + D) and L Ficat and Arlet stages (stage 0,1,2,3,4), L Steinberg stages (stage 0, 1A, 1B, 1C, 2A, 2B, 2C, 3A, 3B, 3C), L Mitchell stages (A, B, C, D, C + D). **Conclusion:** During the evaluation, attention should be paid to the points that may be avascular necrosis especially in patients presenting with hip pain, it is also very important not to ignore necroses in surrounding bone tissues even if detect avascular necrosis at the femoral head or not present. In our study, we found that there was a statistically positive relationship between the presence of infarction in the surrounding bone tissues and AVN. Infarcts in the surrounding bone tissues can be both stimulating for AVN at the time of examination and also for future AVN.

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TRANSFUSION MEDICINE / APHERESIS / CELL PROCESSING

OP 30

EVALUATION OF THE RELATIONSHIP OF ABO BLOOD GROUPS WITH MIS-C

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Emel UYAR, Emine AZAK, Oktay PERK,
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Objective: In the second half of April 2020, a new syndrome associated with SARS-CoV-2 infection,"multisystem inflammatory syndrome in children" (MIS-C), was defined by the World Health Organization.However, the risk factors that predispose some children to develop this inflammatory response are poorly understood .Determining the clinical risk factors of MIS-C is important in preventing undesirable complications such as death in children. **Methodology:** In this study, we aimed to investigate the effect of ABO blood groups, hematological parameters (white blood cell, absolute neutrophil, absolute lymphocyte, platelet count, prothrombin time, activated partial thromboplastin time), cardiac parameters (troponin, brain natriuretic factor, electrocardiography) of patients diagnosed with MIS-C in Ankara City Hospital during the pandemic shortening fraction, ejection fraction), infectious parameters (c-reactive protein, interleukin-6, sedimentation) were analyzed retrospectively. **Results:** Of our 89 cases, 49 (55.1%) were group A, 3 (3.4%) were group AB (3.4%), and 11 (12.4%) were group B. 60 of our patients presented with cardiac involvement, 14 with acute abdomen, 1 with seizure,

and 1 with acute kidney injury. In clinically severe cases, MPV was higher and platelet count was lower. O blood group were diagnosed with MISC at a later age. Patients with A blood group have a statistically significantly less serious course compared to other blood groups. **Conclusion:** In our study, we found that individuals with A blood group had MISC more frequently than other blood groups, and MISC was less severe in these patients compared to other blood groups.

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OP 31

EVALUATION OF APPROPRIATE USE OF PEDIATRIC FRESH FROZEN PLASMA IN A TERTIARY CARE HOSPITAL

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Objective: Fresh frozen plasma (FFP) is the primary source of coagulation factors. Indications of FFP use are very limited such as disseminated intravascular coagulation, massive bleeding, thrombotic thrombocytopenic purpura, biopsy for chronic liver disease, and reversing warfarin anticoagulation with severe bleeding. In clinical practice, FFPs are reported to be used inappropriately either in respect of the particular indication or excessive in adult studies. Therefore, we aimed in this study to evaluate indications of pediatric FFP usage in our tertiary care hospital **Methodology:** Patients aged 0-18 years, who were hospitalized in Ankara City Hospital Children's Hospital between September and December 2020, were analyzed retrospectively. Demographic information, diagnosis, FFP transfusion indication, pre-transfusion coagulation results, surgical procedure and bleeding status, and the amount of FFP administered were recorded. Statistical analysis was done with SPSS 18.0 program. **Results:** 1110 units of FFP were transfused to 324 patients (57% males) in 987 transfusion episodes. The mean age of the patients was 5.4±5.7 years68% of the transfusion episodes had a pre-transfusion coagulation testing. 249 (25%) of the transfusion episodes were given before or after minor or major surgery, and 226 (23%) were for plasmapheresis. The most FFP usage was in pediatric and cardiovascular surgery intensive care and hematology/oncology clinics. 69% of the FFP transfusions were appropriate. **Conclusion:** Misuse of FFP exposes patients to unpredictable adverse effects such as allergic reactions, infectious complications, hemolysis, fluid overload, and transfusion-induced acute lung injury (TRALI). In this study, the use of FFP in children was evaluated for the first time in our country, and it was found that the 31% of the FFP transfusions was inappropriate. Regular audit and education programs for the efficient use of FFP by hospital transfusion committees can improve transfusion practices.

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STEM CELL TRANSPLANTATION

OP 32

COMPARABLE OUTCOMES OF ALLOGENEIC PERIPHERAL BLOOD VERSUS BONE MARROW HEMATOPOIETIC STEM CELL TRANSPLANTATION IN CHILDREN

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Objective: Hematopoietic stem cell transplantation (HSCT) is used in many malignant and non-malignant diseases in pediatric patients. Peripheral blood (PB), bone marrow (BM) or cord blood can be used as a graft source. In this study, it was aimed to compare the transplantation results of patients who used bone marrow as a graft source and those who used peripheral blood in pediatric patients who underwent allogeneic HSCT. **Methodology:** We retrospectively analyzed the transplant results of 349 pediatric patients who received a transplant between April 2010 and August 2021 considering their stem cell source as a comparative variable. Engraftment days, development of acute graft versus host disease (aGVHD) or chronic graft versus host disease (cGVHD), development of relapse and overall survival of patients were evaluated. The source of stem cells was BM in 240 and PB in 109 patients. **Results:** The mean age of patients was 96.8±60 and 94.5±63 months in BM and PB group, respectively. The mean myeloid and platelet engraftment time was statistically significantly earlier in PB group ($p<0.001$). Acute GVHD was statistically significantly higher in PB group ($p<0.001$). The relapse rate was statistically significantly higher in the PB group (p:0.02). The mean follow-up period was 49.2±41.6 months. The 5-year overall survival rate was 83.4% in the BM group and 68.5% in the PB group (p:0.003). **Conclusion:** In our study, in accordance with the literature, it was observed that myeloid and platelet engraftment was earlier if the source is PB in HSCT in pediatric patients, but acute GVHD was more frequent. In the survival analysis, the 5-year survival of the bone marrow transplant group was found to be higher. Peripheral blood could be an alternative stem cell source in patients but it would be more appropriate to decide the stem cell source according to the primary diagnosis of the patients.

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CONSULTATION HEMATOLOGY

OP 33

A RARE CAUSE OF SIDEROBLASTIC ANEMIA: TRNT1 MUTATION

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Case report: tRNA nucleotidyltransferase 1(TRNT1) gene encodes a polymerase involved in the maturation of cytosolic and

mitochondrial transfer RNAs. Autosomal recessive loss of function mutations of TRNT1 leads sideroblastic anemia, immunodeficiency, fevers and developmental delay at varying degrees. Here we present a 10-year-old girl with periodic fever, retinitis pigmentosa, B cell deficiency, seizures and transfusion free sideroblastic anemia due to compound heterozygote TRNT1 mutation.

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PEDIATRIC ONCOLOGY ABSTRACT CATEGORIES

LYMPHOMAS

OP 34

BURKITT LYMPHOMA PRESENTING WITH EYE AND KIDNEY INVOLVEMENT: CASE REPORT

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Case report: Burkitt lymphoma (BL) is an aggressive form of B-cell non-Hodgkin lymphoma. It may present with a variety of symptoms leading to possible misdiagnosis and delay in treatment. BL is fatal if left untreated, and early diagnosis and treatment can improve prognosis. In this case report, a 3.5-year-old male patient with no known disease had left eyelid swelling and hematuria, and orbital magnetic resonance imaging performed after his admission showed contrast enhancement in the bulbus oculi, and increased uptake in both kidneys (suvmax:9.5) in positron emission tomography. The patient's bone marrow aspiration was normal. There was no involvement in the evaluation of the central nervous system. As a result of kidney biopsy, he was diagnosed with high-grade B-cell lymphoproliferative disease (Ki-67 95-100%, diffuse positivity with CD79a and EBV). Burkitt lymphoma. The treatment of the patient was started in the NHL-BFM 2012 R4 arm. At the end of the treatment, the ocular findings regressed. Burkitt lymphoma may present with different clinical presentations. If appropriate and rapid imaging techniques are used, positive results on survival can be obtained. Our patient is being followed up alive and well.

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BRAIN TUMOURS

OP 35

NECESSITY FOR A CUSTOMIZED NGS PANEL FOR ACCURATE DIAGNOSIS AND TARGETED THERAPIES IN PEDIATRIC GLIAL TUMORS

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Objective: Pediatric glial tumors comprise wide range pathologies which may mimic histomorphological features of each other's but generally have very diverse disease course. WHO Classification of Tumors of Central Nervous System (2016 and 2021) points to the necessity of investigating several molecular alterations for integrated pathological diagnosis of childhood CNS tumors. This makes customized next-generation sequencing (NGS) a powerful tool for the diagnosis of childhood CNS tumors. **Methodology:** Acıbadem Molecular Pathology Brain Tumor NGS Panel was designed according to targeted deep RNA and DNA sequencing. RNA and DNA were isolated from paraffin blocks containing more than 50% tumor in 45 cases with childhood CNS tumors. Miniseq Sequencıng System, Illumına and Archer Analysıs Ver 6.0.3.2 platforms were used. Fusions (translocations), mutations, and DNA copy number changes in 81 genes were screened for the most common molecular alterations in CNS tumors. **Results:** Fourty-five childhood CNS tumors were evaluated with NGS results. Among these there were 19 pilocytic astrocytomas, 1 case of high grade astrocytoma with piloid features, 4 diffuse leptomeningeal glioneuronal tumors, 1 pleomorphic xanthoastrocytoma, 4 pediatric diffuse glial tumors, 1 infantile hemispheric astrocytoma, 1 astroblastoma, 12 diffuse midline glioma. Sixteen of these tumors were able to be diagnosed based on these molecular findings. Thirty-four cases received targeted therapies. **Conclusion:** The customized NGS panel, as a single molecular workflow is very helpful and supportive in diagnosis for CNS childhood tumors. Since the number of driver mutations are few in childhood tumors, detection of the driver molecular alteration is guiding the medical treatment startegy in terms of targeted regimens.

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OP 36

CONSTITUTIONAL MISSMATCH DEFECT REPAIR DISORDER (CMMRD) IN PEDIATRIC HIGH GRADE GLIOMA

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Objective: Pediatric high grade gliomas(HGG) have dismal prognosis with median survival of 9-15 months after standard radiochemptherapy. Recent molecular investigations revealed a missmatch repair defect called Constitutional Mismatch Repair Deficiency (CMMRD), which induce pediatric HGG. In CMMRD, there are mutations at least one of the mismatch repair(MMR) genes in both tumoral and non-tumoral DNA. Patients generally have cafe au lait spots resembling the ones in NF-1. **Methodology:** Forty-four pediatric high-grade glioma cases operated in our clinic between 2015-2021 were included in the study. PMS2, MLH1, MSH6, MSH2 immunohistochemical antibodies were applied to the sections prepared from paraffin blocks with tumors of these 44 cases. Next generation Sequencing (NGS) Custom Panel for Brain Tumors was performed with DNA and RNA obtained from neoplastic tissue of 2 cases and germline NGS analysis was performed with DNA obtained from peripheral blood in 1 case. **Results:** MMR protein expression loss was detected in 11 (25%) cases. In 5 (45%) of these 11 cases, MMR protein loss was detected in both neoplastic and non-neoplastic tissue, and these cases were considered as CMMRD. NGS performed in 2 of these 5 cases revealed a hypermutant profile. At least one MMR protein loss was found only in the neoplastic tissue in 6 (55%) of 11 cases, and PMS2 deficiency was the most common. In 1 of these 6 cases, MSH6 deficiency was shown as germline by NGS. **Conclusion:** CMMRD and MMRD, are disorders with close relationship with pediatric high grade gliomas. Since CMMRD cases also may have cafe au lait spots, they should not be misdiagnosed as NF 1. Temozolomide induce more aggressive tumors in CMMRD ve MMRD, therefore its use is not suggested in those cases. Preliminary literature data advocate use of immunotherapy instead. All pediatric HGG cases should be evaluated for CMMRD and MMRD with molecular investigations to understand their biology.

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OP 37

IS METHYLATION STATUS SUBGROUPING REALLY A STRONG PROGNOSTIC FACTOR IN PEDIATRIC POSTERIOR FOSSA EPENDYMOMA?

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Objective: The effective treatment of posterior fossa ependymomas is surgery followed by radio-chemotherapy. Our aim is to evaluate the effects of sex, age, methylation subgrouping, extent of resection, radiation treatment (RT), MIB-1 index, grade, ATRX and H3K27M mutations on prognosis in pediatric patients with posterior fossa ependymoma (PFE). **Methodology:** This is a retrospective study. Forty-two children with PFE who had surgery in our institution between 1996 and 2018 were included. Formalin-fixed paraffin-embedded tumor samples were evaluated for H3K27me3 immunostaining, MIB-1 index, WHO grades, ATRX and H3K27M mutations.Samples with global H3K27me3 reduction were grouped as posterior fossa ependymoma group A (PFA), whereas tumor samples with H3K27me3 nuclear immunopositivity were grouped as posterior fossa ependymoma group B (PFB). **Results:** Mean age of patients was 4.4 years (range 0.71-14.51). Thirty-one patients (73.8%) were PFA, whereas 11 patients (26.2%) were PFB. WHO grades of PFAs were statistically higher in comparison to WHO grades of PFBs. There are no significant differences between PFAs and PFBs in terms of resection rates, disease recurrence and survival parameters.Patients with total surgical excisions had significantly better PFS and OS rates. **Conclusion:** Extent of surgical excision is the most important prognostic indicator in PFEs. Prognostic effect of methylation subgrouping may be minimized with more aggressive surgical strategy in PFAs.

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NEUROBLASTOMA

OP 38

NEUROBLASTOMA IN A CASE OF CONGENITAL ADRENAL HYPERPLASIA

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SBÜ Ankara Şehir Hastanesi, Çocuk Hastanesi

Case report: The majority of neuroblastomas are sporadic and not correlated with any specific constitutional germline chromosomal abnormality, inherited predisposition, or associated congenital anomalies. We report here a 1.5-year-old girl with a diagnosis of 21 hydroxylase deficiency and neuroblastoma. Neuroblastoma in a known case of congenital adrenal hyperplasia has rarely been reported. Based on our literature review, this is the fifth case report of congenital adrenal hyperplasia and neuroblastoma.

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BONE TUMOURS

OP 39

CAN SERUM KL-6 LEVEL BE USED AS A MARKER IN LUNG METASTASIS OF BONE SARCOMAS?

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Objective: Osteosarcoma and Ewing sarcoma are the most common bone sarcomas of the childhood. Kerbs von de Lungren 6 (KL-6) is a glycoprotein that is expressed on type 2 pneumocytes and bronchial epithelium. Serum KL-6 level can increase in many interstitial pulmonary diseas and lung cancers. Aim of the study is to evaluate the predictive value of serum KL-6 level on malign potential of pulmonary nodules in pediatric patients with bone sarcoma with pulmonary metastasis or with vague pulmonary nodules. **Methodology:** Blood samples were taken from patients with diagnosis of Ewing sarcoma or osteosarcoma at the time of diagnosis or first relapses. Control group was selected from 42 voluntary children without any chronic or acute diseases associated with lung. Serum of the blood samples were separated and frozen at -70 C° and KL-6 level was measured via ELISA method. Thorax computed tomography (CT) images of the patients were analyzed to interpret about pulmonary metastasis. **Results:** Total 47 patients were included in the study, 19 of the patients were with Ewing sarcoma and 28 with osteosarcoma.Thorax CT revealed pulmonary metastasis in 9 of the patients at first evaluation. KL-6 level of the these patients with pulmonary metastasis was greater than without metastasis (p;0.05) and control group (p;0.019). Patients with pulmonary nodule at any time had significantly higher serum KL-6 level at first evaluation than without metastasis (p; 0.04) and control group (p;0.017). **Conclusion:** In our study we found serum KL-6 level higher in patients with pulmonary nodules that relevant with pulmonary sarcoma metastasis than patients without metastasis and healthy control group. Our study also revealed that patients that had pulmonary metastasis during their follow-up also had higher KL-6 level at diagnosis. These results should be proven with more number of patients. Measuring KL-6 level may be used as a marker for early diagnosis of pulmonary sarcoma metastasis.

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RARE TUMOURS AND HISTIOCYTOSIS

OP 40

PROLONGED COVID-19 POSITIVITY AND CHEMOTHERAPY IN A PATIENT WITH NASOPHARENGEAL CARCINOMA

Seda Şahin, Neriman Sarı, Derya Özyörük, Sonay İncesoy Özdemir, Belgin Gülhan, İnci Ergürhan İlhan

Ankara Şehir Hastanesi

Case report: Nasopharyngeal carcinoma is a rare tumor that accounts for 1-3% of all childhood malignancies. A 16-year-old patient with refractory nasopharyngeal carcinoma, whose treatment has to be interrupted due to COVID-19 positivity.After 6 weeks because of disease progression, we started his chemotherapy altough he is still COVID-19 positive. We didn't see any complication. Prolonged COVID-19 positivity is thought to be associated with the infection of immortal malignant cells located in the nasopharynx

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OP 41

EVALUATION OF CLINICAL AND LABORATORY CHARACTERISTICS OF CHILDREN WITH RHABDOID TUMOR: A MULTICENTER STUDY

Firdevs AYDIN [1], Kemal DENİZ [1], Süreyya Burcu GÖRKEM [1], Veysel GÖK [1], Alper ÖZCAN [1], Ebru YILMAZ [1], Ekrem ÜNAL [1], Musa KARAKÜKÇÜ [1], Türkan PATIROĞLU [1], Mehmet Akif ÖZDEMİR [1], Can ACIPAYAM [2], Defne AY TUNCEL [3]

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Objective: Rhabdoid tumors, which are rare in childhood, are aggressive cancers. It can be particularly seen in 3 different anatomical regions, mostly in the central nervous system, kidneys, and soft tissue in early childhood. In this study, it was aimed to evaluate the clinical, radiological and pathological features of pediatric patients with rhabdoid tumors who were followed up and treated in 3 different pediatric oncology reference centers. **Methodology:** Erciyes University Faculty of Medicine, Kahramanmaraş Sütçü İmam University Faculty of Medicine, Health Practice and Research Hospital and Adana City Training and Research Hospital, 17 patients diagnosed with rhabdoid tumor between 2002-2021 were retrospectively analyzed. **Results:** Of the patients, 6 (35%) were female and 11 (65%) were male. Chemotherapy (Doxorubicin, Ifosfamide, Carboplatinum, Etoposide, Vincristine, Actinomycin-D, Cyclophosphamide) was administered to the patients at different times. Radiotherapy was applied to 8 (47%) of the patients. The tumor was in the brain in 8 (47%) of the patients, in the kidney in 4 (23%), in the skin in 4 (23%), and the liver in 1 (6%). **Conclusion:** In this study, the incidence of rhabdoid tumors was higher in males. This may be due to the small number of cases. The 2 years overall survival rates were 50% in brain tumors, 6% in kidney tumors, and 12% in others, according to tumor localization. The localization and stage of the tumor were determinants of the survival of the patients. More clinical studies are needed to improve survival and identify more effective treatment strategies in these tumors.

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PEDIATRIC LEUKEMIAS

OP 42

ACUTE ABDOMEN AND ITS OUTCOMES IN CHILDREN WITH ACUTE LEUKEMIA

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Objective: Acute abdominal conditions such as tiflitis, acute appendicitis and intussusception can be found in the follow-up of children with leukemia. Its considered if one or more of the symptoms of abdominal pain, vomiting, fever, distention in the abdominal examination, sensitivity, tenderness and defenses are available together and the diagnosis is supported by radiological imaging methods. In these patients, making a surgical decision is not as easy as those with a strong immune system due to the increased risk of complications and death. Antimicrobial therapy, blood indrigents and electrolyte support are vital. In this study, we examined our patients with leukemia diagnosed with acute surgical abdomen in terms of clinical findings, prognosis and treatments, and we aimed to show that the results were satisfactory with good management in these patients. **Methodology:** Totally 9 patients who underwent surgery due to acute abdomen when all were in follow up in our hospital's Pediatric Hematology-Oncology Clinic between July 2016 and December 2020 were examined retrospectively. The patients were under treatment according to the Berlin-Frankfurt-Munich protocol risk groups. The diagnosis of acute abdomen was made with clinical, laboratory and radiological findings. Abdominal direct X-ray graphy view of 2 years old unpefore tiflitis patient displayed in Figure1. The criterion for appendicitis was accepted as measuring the diameter of the appendix > 6mm in thickness, 3 mm thickness of cecum or terminal ileum for ultrasonography (USG) or Computed Tomography (CT). Abdominal computed tomography of 11 years old unpefore tiflitis patient displayed in Figure 2. Demographic information, diagnosis, clinical and laboratory findings, radiological examinations, treatments and results of the patients were recorded. (Table 1) **Results:** Seventh of the patients were diagnosed as ALL, two were AML, two were operated due to perforated tiflitis, five were acute appendicitis, one was operated due to intussusception, and five were girls and four were males. All patients received broad-spectrum antibiotic therapy and four received additional antifungal therapy. Liquid electrolyte disturbance was observed and recovered in two patients. While blood product transfusions were applied to all patients, one patient was given additional granulocytes and pentaglobulin. A second operation was required due to the delayed wound healing in one patient. Apart from this, no complications were seen. Chemotherapy regimens were continued. (Table 2) **Conclusion:** Acute appendicitis has been reported with a frequency of 0.5-4.4%, tiflit 2.6-10% in different studies in pediatric patients with hematologic cancer. The diagnosis of acute abdomen should be rapidly considered and supported by imaging methods. Although the complications and mortality rates of surgery in these patients are higher than the immune system intact patients, early diagnosis, broad-spectrum antibiotics, antifungal use, appropriate liquid electrolyte and blood product support can be performed successfully.

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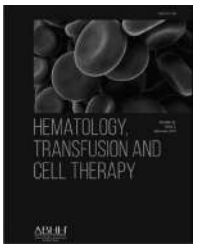

POSTER PRESENTATIONS

ADULT HEMATOLOGY ABSTRACT CATEGORIES

ACUTE LEUKEMIAS

PP 01

ASPARAGINASE INDUCED SINUS VEIN THROMBOSIS IN AN ADULT YOUNG ALL PATIENT

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Objective: Asparaginase has a very important role in ALL treatment among increasing of remission rate and duration. Multiple side effects prevent its regulatory use. Asparaginase reduce antithrombin 3, heparin cofactor II, protein C and plasminogen synthesis. By the way, P-selectin, PAI 1, tissue factor activity, and vWF antigen levels increase. Hypofibrinogenemia may be a marker of of hemostasis disturbances and decreased protein synthesis. **Case report:** A 25-year-old male patient with acute T-cell lymphoblastic leukemia diagnosis was initiated on induction chemotherapy according to augmented BFM protocol. After 4 weeks, remission was confirmed. During consolidation with the third dose of standard L-asparaginase of 10000 units, headache, nausea and vomiting started and confusion developed. Biochemical investigations, PT, aPTT were within normal limits. Fibrinogen was 92 mg/dL and D-dimer was high.Contrast-enhanced MRI showed a thrombus occluding. **Methodology:** the superior sagittal sinus. He was intubated and followed up in the intensive care unit due to a rapid decline in the Glasgow score and epileptic seizures. Correction of fibrinogen with cryoprecipitate anticoagulation treatment contributed to symptoms improvement. unfortunately, asparaginase was removed from the protocol. During maintenance therapy, he has had severe COVID-19 pneumonia and during this time he did not experience any thrombosis related complications. **Results:** Asparaginase therapy is associated with low antithrombin and fibrinogen levels and 7% of thrombosis rate. Previous studies showed that, in ALL patients, thrombosis occurred far more frequently during cycles that contained asparaginase than those that did not. **Conclusion:** Therefore, studies have investigated the role of fresh frozen plasma or cryoprecipitate supplementation to reduce the thrombohemorrhagic risk of therapy. Retrospective studies suggest antithrombin concentrates may have a beneficial effect on the outcomes of adults treated with asparaginase for ALL.

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PP 02

VENETOCLAX AZACITIDINE COMBINATION THERAPY IN FIRST-LINE TREATMENT OF ACUTE MYELOID LEUKEMIA PATIENTS: A SINGLE CENTER EXPERIENCE

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Objective: The response of elderly patients with acute myeloid leukemia (AML) to standard induction therapy is quite poor due to higher frequency of adverse genomic features, increased resistance to treatments, comorbidities and performance status. BCL-2 overexpression is implicated in survival of AML cells and treatment resistance. Preclinical data demonstrated the anti-leukemic effect of venetoclax, a selective BCL-2 overexpression is implicated in survival of AML cells and treatment resistance. **Methodology:** Venetoclax has received FDA approval for the treatment of AML patients >75 years of age and in combination with hypomethylating agents/low-dose cytarabine in patients not eligible for intensive therapy. Six newly diagnosed AML patients who were followed up in Gülhane Education and Training Hospital, Hematology clinic and treated with azacitidine+venetoclax were evaluated retrospectively. **Results:** F/M:1/5,the mean age was 77.3 (63-87).Two patients were secondary AML.All

2531-1379/

patients had normal karyotype.Venetoclax+azacytidine treatment was started in all patients as first-line treatment after obtaining off-label consent.The average number of courses of venetoclax + azacitidine administered 3.5 (1-8).Patients received 200 mg/day venetoclax because of fluconazole usage concomittantly.One patient died with a FEN attack at the end of the second cycle, and 5 patients are still being followed up. **Conclusion:** Azacitidine or decitabine monotherapy yields low response rates (10%-50%, including hematologic improvement), require 3.5 to 4.3 months to achieve best response, and are not curative, with a median OS of less than 1 year.Targeted therapies capable of rapidly inducing a high rate of clinical response, with better tolerability and durable responses for elderly patients with AML. The novel combination of venetoclax with decitabine or azacitidine was effective and well tolerated in elderly patients.

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PP 03

A REGISTRY-BASED, OBSERVATIONAL SAFETY STUDY OF INOTUZUMAB OZOGAMICIN (INO) IN PATIENTS WITH B-CELL PRECURSOR ACUTE LYMPHOBLASTIC LEUKEMIA (ALL) PROCEEDING TO HEMATOPOIETIC STEM CELL TRANSPLANT (HSCT)

David MARKS [1], Marcos DE LIMA [2], Partow KEBRIAEI [3], Francesco LANZA [4], Christina CHO [5], Sergio GIRALT [5], Gizelle POPRADI [6], Michael HEMMER [7], Wael SABER [7], Xin ZHANG [8], Richa SHAH [8], Verna WELCH [8], Erik VANDENDRIES [8], Matthias STELLJES [9]

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Objective: InO is a CD22-directed antibody-drug conjugate indicated for treatment of relapsed/refractory (R/R) ALL. InO has been associated with hepatotoxicity and hepatic veno-occlusive disease/sinusoidal obstruction syndrome (VOD/SOS), particularly post-HSCT. Registry data from the Center for International Blood and Marrow Transplant Research (CIBMTR) was analyzed to assess toxicity in patients (pts) with ALL who received InO prior to HSCT. **Methodology:** CIBMTR patient data are being collected from 2017-2022 after US approval of InO. Data accrued from 2017–2020 from 131 US adult pts (median age 40 y) treated with InO who proceeded to allogeneic HSCT were included. Using interim data at 3 y, we evaluated post-HSCT outcomes, including clinical status, overall survival (OS), non-relapse mortality (NRM), relapse, death after relapse, and investigator-defined adverse events, including hepatic VOD/SOS. All statistical analyses are descriptive. **Results:** Before HSCT, 36% of pts received 1 InO cycle, 46% had 2 cycles, 17% had ≥3 cycles. Median time from last InO dose to HSCT was 2.0 mos (range: 0.4–26.2). At data lock (Nov 2020, n=131), VOD/SOS incidence within 100 d post-HSCT was 13% (18% of R/R ALL pts, n=91). Post-HSCT 12 mo OS was 55%; post-HSCT 12 mo NRM was 21%; post-HSCT 12 mo relapse was 36%; non-HSCT-related 12 mo mortality was 25%. Most pts (89%) who underwent HSCT during complete remission (CR) experienced continued CR post-HSCT. **Conclusion:** Incidence of VOD/SOS after first HSCT in InO-treated pts with R/R ALL in this study was similar to the 18-19% reported in pooled analyses of 2 clinical trials among InO-treated pts with R/R ALL and in the INO-VATE study. The NRM at 1 y of 21% (23% R/R ALL) is lower than the NRM at 1 y of 38% reported in the pooled analyses of R/R ALL InO recipients.

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PP 04

ANTI-CD52 TREATMENT EXPERIENCE IN A T-CELL PROLYMPHOCYTIC LEUKEMIA PATIENT:CASE REPORT

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Objective: T-cell prolymphocytic leukemia (T-PLL) is a rare and highly aggressive T cell neoplasm with rapidly progressing clinical course. T-PLL accounts for 2% of mature lymphocytic leukemia in adults. Median overall survival with modern therapy is reported one to three years. Here we report a T-PLL patient with peritoneum involvement and progressive ascite despite anti-CD52 treatment. **Case report:** A 65-year-old man with diabetes mellitus was admitted to hospital due to fatigue for a few weeks. Laboratory workup revealed that white blood cell count $469 \times 103/\mu l$ (90% lymphocytes), haemoglobin of 11.4 g/dl, platelets of $104 \times 103/\mu l$. Medium sized atypical lymphoid cells with partial chromatin condensation and a visible nucleolus were observed on blood smear. **Methodology:** On physical examination, palpable inguinal lymph nodes, splenomegaly 3 cm below the rib margin and a palpable lesion on the helix of left ear were noticed. Punch biyopsy of skin lesion was reported as a mature and immature T cell infiltration which are CD3 and CD10 positive and Tdt, CD34, CD20, CD99 negative. Flow cytometric study of peripheral blood sample was revealed that T-Chronic Lymphocytic Leukemia (T-CLL). **Results:** FMC protocol (fludarabine, mitoxantrone, and cyclophosphamide) was initiated and followed by intravenous alemtuzumab at a dose of 3 mg on day 1, 10 mg on day 2 and 30 mg on day 3. However after two months of

anti-CD52 treatment, his general situation dete-riorated and pleural effusion and abdominal distension developed due to massive ascites. Small, mature lymphocytic cell infiltration was shown in ascites fluid on cytological examination. He died after six months of diagnosis. **Conclusion:** T-PLL is a very aggressive disease with a median survival of less than 1 year. Not all patients diagnosed with T-PLL require treatment immediately.Currently, IV alemtuzumab (anti-CD52) is the accepted best avaliable treatment with very high response rates when given as first-line treatment. However, treatment is notcurative and a minority of T-PLL patients experience long-term disease-free survival.

https://doi.org/10.1016/j.htct.2021.10.1014

PP 05

RETROSPECTIVE EVALUATION OF PATIENTS WITH ACUTE MYELOID LEUKEMIA RECEIVING VENATOCLAX-BASED TREATMENT

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Objective: Acute myeloid leukemia (AML) is the disease of elderly patients. Therefore, a significant number of patients are not suitable for intensive induction chemotherapy. In this study, it was aimed to retrospectively evaluate patients with AML who were treated Venatoclax-based regimens in our center. **Methodology:** The data of the patients who were treated Venatoclax-based regimens with the diagnosis of AML in the Bozyaka Training and Research Hospital Department of Hematology were scanned retrospectively from their files. **Results:** Data of 11 patients in total were reached. The mean age of the patients was 73.9. 8 of 11 patients were follow-up with diagnosis of AML , 3 patients with MDS RAEB II. Average follow-up time was 13.6 months. 5 patients died during follow-up. HMA +venatoclax was given to 6 patients as first-line, 4 patients second-line and 1 patient third-line therapy. Complete response was found in 3 patients, partial response in 1 patient, stable disease in 1 patient, and refractory disease in 1 patient. **Conclusion:** Venatoclax is a promising treatment option because it is an oral agent that can be tolerated by elderly patients and improves response rates and survival.

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PP 06

BONE MARROW NECROSIS IN ACUTE LYMPHOBLASTIC LEUKEMIA: A CASE REPORT

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Objective: Bone marrow necrosis (BMN) is an entity that necrotic cells are seen on amorphous eosinophilic ground with medullary infarctus but withouth cortical bone involvement. BMN is a postmortem diagnosis in most of the reports. Bone marrow biopsy and aspiration is essential for the diagnosis. The case we report here is a patient who is diagnosed BMN and ALL at the same time with the first bone marrow biopsy, which is showed extensive necrosis. **Case report:** A 42-year-old man applied to our E.R. with lumbal pain. The initial blood count showed leukocyte:5.13 × 109/l, neutrophil:2.68 × 109/l, Hgb:10.7 g/dl, Hct: %31.5, thrombocyte:127 × 109/l, LDH:539 u/l (N:0-250), ALP:185 u/l (N:40-150), Total Bilirubin:0.81 mg/dl, CRP:337mg/l (N<5)), ESH: 94mm/h, folic acide: 2.8ng/ml (N>5.4), Vitamin B12:398 pg/ml (N:210-900), ferritin: 5607 ug/l (N:22-320), fibrinogen:1304 mg/dl (N:200-400), D-Dimer:646 ug/l (N<243) and a normal range for PZ, aPTZ, INR. **Methodology:** Peripheral smear showed %38 PMN, %56 lymphocyte, %6 monocyte, normoblasts, rare tear drop cells and rare thrombocytes. Pathological evaluation revealed hypercellular bone marrow (%95), extensive necrosis, CD3(-) CD5(-) CD20(+), CD38(-), CD10 diffuse(+), BCL2(+) MPO(-) CD117(-), CD34(+) CD79a, Pax5 and TdT suboptimal (+). Flow cytometry showed no significant result because of the deficiency of material. PCR revealed no BCR-ABL transcript. **Results:** The patient diagnosed B precursor ALL. With the BFM IA protocol complete remission obtained. At the control BMB CD3, CD20, CD79a, Pax5, TdT, MPO, CD34 was applied but there was no neoplastic involvement. After the BFM IB protocol, complete remission has been pursued. The patient is currently receiving the BFM IC protocol. **Conclusion:** BMN is an uncommon pathology with poor prognosis. Primary etiology is malignancies, especially hematologic malignancies, at %90 of the cases. As we see at this case, while the clinical and laboratory findings are insignificant; when a patient shows fever with unknown origin, bone pain, newly developed cytopenias, we must keep in mind the diagnosis of BMN and if a patient is diagnosed BMN, necessary scaning must be done immediately for malignancies as the primary cause.

https://doi.org/10.1016/j.htct.2021.10.1016

PP 07

NEXT GENERATION SEQUENCING PRACTICES IN HEMATOLOGY: A RECENT EXPERIENCE OF A SINGLE CENTER

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Objective: Next-generation sequencing (NGS)-based technologies are novel methodologies for the diagnosis, prognostic assessment and decision of individualized treatment strategy in hematological neoplasia. NGS led to a more comprehensive understanding of the mutational landscape, especially in the myeloid neoplasms. Herein, we present the results of the patients who underwent NGS with the suspicion of myeloid neoplasia. **Methodology:** Retrospective data from a total of 13 patients were analyzed who were diagnosed between 01.10.2018 and 01.06.2021. There were four myeloid panels in the NGS. Panel 1 consists of ASXL1, CALR, CBL, CEBPA, CSF3R, and DNMT3A mutations. Panel 2 consists of EZH2, FLT3, IDH1, IDH2, JAK2, KIT, KRAS, and MPL mutations. Panel 3 consists of NPM1, NRAS, RUNX1, SETBP1, and SF3B1 mutations. Panel 4 consists of SH2B3/LNK, SRSF2, TET2, TP53, U2AF1, ZRSR2 mutations. **Results:** Median age was 48. Diagnoses were AML (n=7), AA (n=1), MDS (n=2), DLBCL (n=1), MM (n=1), and Evans syndrome (n=1). Seven cases with malignant diagnoses were eligible for intensive therapy. There were no mutations detected by NGS in MM, AA, DLBCL, and Evans syndrome cases. Biallelic CEBPA mutation accompanied FLT3 mutation in 1 case. IDH1 and NPM mutation were detected in 1 APL case. MPL, SRSF2, ASXL1, CBL, U2AF1, SF2B1, and TET2 were mutations detected in cases with dysplasia. **Conclusion:** In our cohort, NGS did not add any significant information in the lymphoid malignancies and benign hematological cases. NGS helped to define the allelic ratio of FLT3+ mutations and helped to accurately define the ELN risk of AML. Mutations that were detected in the cases with dysplastic bone marrow findings were concordant that were reported in the literature. Larger case series are needed in order to define the therapeutic and prognostic implications.

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PP 08

INAPPROPRIATE ADH SYNDROME OCCURING DURING B-ALL TREATMENT

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Case report: Inappropriate ADH syndrome is a cause of hyponatremia with increased ADH secretion despite normal plasma osmolality and euvolemic state.There are many related drugs in its etiology.Inappropriate ADH syndrome occured in two B-ALL diagnosed patient during cyclophosphamide and vincristine treatment regimen.The detection of inappropriate ADH syndrome in both patients with euvolemic hyponatremia shows the importance of reviewing the drugs used by the patient in the etiology of hyponatremia.

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PP 09

T-ACUTE MYELOID LEUKEMIA CASE THOUGHT TO BE ASSOCIATED WITH RADIOIODINE (I^{131}) TREATMENT

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Case report: Ionizing radiation and chemotherapeutic agents can cause carcinogenic effects by causing DNA damage.A 40-year-old female patient diagnosed with thyroid papillary carcinoma in 2016 and subsequently administered 150 mCi radioiodine (I^{131}). Leukocytosis was detected in the examinations performed due to urinary system infection. She was diagnosed t(9:22) p210 positive AML M1-2. The patient had a history of Stargardt Syndrome.Development of t-AML after radioiodine treatment is very rare.

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PP 10

FLT3-ITD POSITIVITY IN AML; CASE SERIES

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Objective: Diagnosis of AML requires additional procedures, including pathological examination, immunophenotyping, cytogenetic examination, and molecular diagnosis. The determination of the specific cytogenetic abnormality is important for the selection of appropriate treatment and prognostic analysis.The 2 most common mutations of the FLT3 gene are FLT3-ITD and FLT3-D835. Here, we will present FLT3-ITD positive AML cases admitted to our clinic between 2019-2021. **Case report:** We have 5 cases of AML FLT3-ITD heterozygous. In all our cases, Midastaurin was given with 7+3 chemotherapy (CT) in the initial treatment. While 1 of our cases went into remission, the other 4 relapsed. All of the patients who relapsed were given FLAG CT, no remission was achieved and they were switched to ADE CT. Remission was achieved in 2 of 4 patients, 2 of them were refractory. One patient was given gilteritinib. HSCT was performed in 2 patients. While 2 of our

patients are dead, 2 of them are in remission and 1 of our patients is still under treatment. **Results:** FLT3 gene mutations are strongly associated with leukocytosis and poor prognosis in patients with AML(1-3). Patients with any of these mutations have a higher risk of recurrence and a lower survival rate[3]. All of our patients had leukocytosis at the time of diagnosis. Four of our patients relapsed and all of these patients were refractory to chemotherapy. Our patients who were refractory to treatment had a high mortality rate (50%) and a lower survival time (8-12 months). **Conclusion:** FLT3 signaling inhibitors have been used both alone and in combination to improve clinical outcomes in patients with AML with FLT3 mutations. While inhibitor monotherapy provides clinical response, its efficacy is usually temporary and resistance develops rapidly. Various combination therapies are used to enhance efficacy and prevent or overcome resistance. More studies are needed to evaluate its efficacy and explain the development of resistance.

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PP 11

EXPERIENCE OF GLASDEGIB IN PATIENTS WITH ELDERLY ACUTE MYELOID LEUKEMIA

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Aim: Acute myeloid leukemia (AML) is characterized by the increase of high levels of myeloid cells in the bone marrow. In general, AML is a disease of older adults. Many adults with AML are unable to receive intensive chemotherapy because of its toxicity.In this study, it was aimed to retrospectively evaluate patients with AML who were treated Glasdegib-based regimens in our center. **Case 1:** A 75-year-old male patient was diagnosed with congestive heart failure + AML, and idarubicin and cytarabine chemotherapy protocol was started. The patient started to receive covid treatment due to covid lung involvement. The patient, whose treatment was interrupted for 1 month, received the second course as LDAC + glasdegib. In the bone marrow biopsy performed after the 5th cycle, it is observed in remission. **Case 2:** An 82-year-old male patient was diagnosed with chronic renal failure. With a diagnosis of AML intermediate risk LDAC+glasdegib treatment was given to the patient who did not go into remission after 4 cycles of decitabine treatment. The patient, who was followed in remission after 4 cycles, died due to pneumonia. **Case 3:** A 76-year-old male patient has a diagnosis of cerebrovascular disease. The patient, who was followed up in remission after 2 courses of azacitidine with a diagnosis of medium risk AML, was approved for glasdegib in the 3rd course of treatment, and he is being followed up with the 3rd course of LDAC+glasdegib therapy. **Material and method:** The data of the patients who were treated Glasdegib-based regimens with the diagnosis of AML in the Bozyaka Training and Research Hospital Department of Hematology were scanned retrospectively from their files. **Results:** In our 3 patients, 1 person died due to pneumonia, but the patient was being followed in remission. Our other 2 patients are still being actively followed up with LDAC + glasdegib treatments. **Discussion:** In 2018, the FDA approved glasdegib, a Hedgehog signaling pathway inhibitor, in adults 75 years of age or older with a diagnosis of AML or those with comorbidities that preclude the use of low-dose cytarabine plus intensive induction chemotherapy. Approval is based on interim results from the phase 2 BRIGHT 1003 study evaluating glasdegib in combination with LDAC or LDAC alone. The median OS was 4.9 months for LDAC versus 8.8 months in patients treated with glasdegib+LDAC. This difference represented an approximately 50% reduction in mortality in patients treated with glasdegib+LDAC. The final result of the BRIGHT 1003 study confirmed that glasdegib LDAC significantly improved OS compared to LDAC alone (hazard ratio, 0.495 [95% CI, 0.325-0.752]; P =0.0004). Also, the addition of glasdegib to LDAC did not cause a significant increase in adverse events.

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CHRONIC LEUKEMIAS

PP 12

SYNTHETIC BIOLOGY MEETS PRECISION MEDICINE: DRUG REPURPOSING FOR BLOOD CANCER PRECISION MEDICINE

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Objective: Optimizing Drug discovery and Translation is one of the key tracks in Global Challenges Annual meeting 2019 and is the critical factor in achieving UN Sustainable Development Goals 3 Good Health and Well Being. WHO reports Cancer is the second leading cause of death globally. The aim of the proposal is to establish robust drug screening platform which can identify drugs and drug combinations that are effective in precision medicine for relapsed individual South African Leukemia patients. **Methodology:** Here, cancer cell will be either directly analyzed using high-throughput drug screening or single cell drug screening will be performed using flow cytometry /microfluidics to provide datasets on drug sensitivity for individual patientsI. WP1: Establishing the culture setting for CLL/MM and high-throughput drug screening on CLL/MM.II. WP2: “Signaling pathway-only” limited drug screening for CLL/MMIII. WP3: Establishing setting for Precision Microfluidics-driven single cell drug screening; **Results:** Expected Results are using full-library drug screening results, we will identify effective drugs and drug combinations that inhibit cancer cell proliferation either through cytostatic or cytotoxic effects. These results will provide the basis for identifying effective drug combinations using our predictive analytics, which will be packaged as preclinical information for a precision clinical trial. Thus, we would establish cutting-edge platform that can handle blood cancer and also solid tumor. **Conclusion:** Using this pipeline, we aim to identify drug combinations that can overcome relapse stage and ultimately provide tailored-specific therapy options for

Cancer patients. Our intention is to develop technologies that provide clinically relevant drug combinations information to oncologists within a timeframe of 7 days. The development and validation of the screening pipeline will incorporate the first CSIR platforms for cancer translational research with respect to identifying effective cancer drugs.

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PP 13

AVASCULAR NECROSIS IN CHRONIC MYELOID LEUKEMIA: A REVIEW OF PATHOPHYSIOLOGY, PATIENTS' CHARACTERISTICS, AND CLINICAL OUTCOMES

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Objective: The exact incidence of avascular necrosis (AVN) in chronic myeloid leukemia (CML) is still unknown as the number of cases is limited. AVN was reported as an initial presenting manifestation in few CML patients. On the other hand, AVN was linked to medications used in CML treatment, specifically interferon-alpha (IFN-α) therapy and tyrosine kinase inhibitors (TKI). Our review aims to describe the pathophysiology, patients' clinical characteristics, and outcomes of AVN in CML. **Methodology:** We searched PubMed and Google Scholar for the case reports and series of patients with CML who developed AVN from inception to July 2021. We found 21 cases of AVN in CML patients,17 cases with AVNFH, and four cases with ONJ. Articles in the grey literature and non-English language publications were excluded. Patient characteristics, hematological parameters, management, and outcomes of AVN were extracted from those articles. **Results:** The median age was 39 years with an almost equal distribution between males and females. WBC counts were strikingly elevated in patients who initially presented with AVNFH (above 10,0000 in most cases). AVN related to CML management has been linked to TKIs and standard IFN-α therapies. Only 6 (out of 17) patients who developed AVNFH eventually required a hip replacement, and one (out of 17) developed a recurrent episode of AVNFH. All the reported cases of CML with ONJ were associated with TKIs **Conclusion:** Given the lack of data, we could not conclude whether AVN has an adverse prognostic effect on CML. However, the overall prognosis is comparable with AVN associated with other conditions. Clinicians should consider AVN in CML patients with either hip or jaw pain because early detection and management are essential to decrease morbidity and long-term disability in such patients. A further prospective study with a larger sample size is needed to clarify the different aspects of AVN in CML patients.

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PP 14

SECONDARY CHRONIC MYELOID LEUKEMIA FOLLOWING RADIOACTIVE IODINE (I131)

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Objective: Radioactive iodine (RAI) with I131 has an established role in managing differentiated thyroid carcinoma, namely papillary thyroid carcinoma (PTC) and follicular thyroid carcinoma. However, concerns have been raised about its possible carcinogenic effects. Papers of t-CML following I131 are increasingly reported, and thus this review is dedicated to highlighting it. **Methodology:** All reports from the 1960s to date related to CML following RAI therapy were searched on Google Scholar and PubMed. Different search terms with Boolean function to search for the relevant articles. **Results:** We identified ten articles reporting 12 cases, as presented in table 1. We found that most of the reports were for men (8/12) under the age of 60 years (10/12), and the primary tumor was of PTC characteristics (5/12 were PTC, and 3/12 were mixed papillary-follicular carcinoma). The dose of I131 ranged between 30 millicuries (mCi) to 850 mCi; the mean dose was 331 mCi. Also, t-CML developed within the first ten years (9/12), mainly between 4-7 years post-exposure. **Conclusion:** A few reports found a statistically significant increased risk of leukemia following RAI therapy; some suggested a relative risk of 2.5 for I131 vs. no I131. Observed findings from these studies include a linear relationship between the cumulative dose of I131 and the risk of leukemia, doses higher than 100 mCi were associated with a greater risk of developing secondary leukemia, and most of the leukemias developed within the initial ten years of exposure.

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CHRONIC MYELOPROLIFERATIVE DISEASES

PP 15

CONCOMITANT LATENT POLYCYTHEMIA VERA AND MGUS.

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Objective: With the introduction of changes in the diagnostic criteria for polycythemia vera (PV) in the 2016 WHO classification, it became necessary to revise the diagnosis in some patients. Cases with latent (masked) polycythemia vera (LPV) were identified. Bone marrow trepanobiopsy takes one of the most important place in the differential diagnosis of LPV with other myeloproliferative diseases.We describe a case with coexistence of LPV and MGUS in a patient at the onset of the disease. **Case report:** Patient F.I., aged 62, was admitted with complaints of burning sensation in both feet, pain in the left lower extremity, back pain, nocturia 2-3 times per night and

weight loss of 6-7 kg.Lumbar and whole spinal MRI revealed changes in the intensity of the medullary signal, mild decrease in the height of L2-L3 and T10 . EMG revealed polyneuropathy.PET showed a moderate uptake of FDG in the localization of the bone marrow. The spleen was enlarged-size-157 mm. **Methodology:** Laboratory findings: hemogram-WBC-11.15 × 103/μL, Hgb-15g / dL, HCT-48%, PLT-604 × 103/μL. Bone marrow biopsy, imprint, aspiration revealed moderately hipercellular bone marrow with increasing in all 3 series, groupings in megakaryocytes, containing limited (3-4%) kappa monoclonal plasma cell population; moderately increasing reticulin fibers (grade 1 according to WHO). Karyotype 46, XY; multiple myeloma FISH panel: translocation 4; 14 and translocation 11; 14 (+). JAK2V617F-50.48% (+). **Results:** The key point in the diagnosis was trilineage hyperplasia of the bone marrow,because the reticulin fibrosis may occurs in 20% of PV cases. Thus, the patient was diagnosed with LPV. Due to the detection of plasma cells in the bone marrow (3-4%), kappa light chains, with the diagnosis of LPV, the diagnosis of MGUS was established.The patient was prescribed ASS 100 mg per os, Hydrea at a dose of 500 mg every other day. For MGUS, the "wait and watch" tactic was chosen. **Conclusion:** In the diagnosis of LPV, along with molecular genetic research, trepanobiopsy of the bone marrow plays a leading role. The possibility of a combination of myeloproliferative and other diseases should not be ruled out.

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PP 16

THE OUTCOME OF FATHERHOOD IN PATIENTS WITH PHILADELPHIA NEGATIVE MYELOPROLIFERATIVE NEOPLASMS, A SINGLE INSTITUTION EXPERIENCE

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Objective: The aim of this retrospective study is to evaluate fertility in the Philadelphia-negative MPN male patients and the effect of treatment received on male fertility and the outcome. **Methodology:** This is a single-center, mixed-design study (retrospective + phone interviews) conducted within the National Center for Cancer Care and Research. **Results:** 120 patients were interviewed, only 19 patients (15.7%) had met the inclusion criteria. The majority of patients had lost follow-up or cannot be contacted, and 29.1% of patients had their families completed by the time of diagnosis. The treatment received includes hydroxyurea, interferon, and ruxolitinib. The mode of delivery was normal vaginal delivery in 68% of the pregnancies. The total number of conceptions was 27; three stillbirths were reported. **Conclusion:** The data showed that most MPN male patients on treatment had their offspring born normally with no delivery complications, no reported congenital anomaly or growth retardation, and no report of MPN-related cancers. Though, further studies with a larger sample size are required to fully understand the effect of medications on the outcome of fatherhood in Philadelphia negative MPN patients.

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PP 17

CONCOMITANT JAK2 AND BCR-ABL1 IN PATIENTS WITH CHRONIC MYELOID LEUKEMIA CLINICAL IMPACT AND RESPONSE TO THERAPY: A SYSTEMATIC REVIEW

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Objective: The aim of this review is to assess patients with chronic myeloid leukemia with concomitant JA2 positive for - their characteristics - response to treatment **Methodology:** We searched the English literature (Google Scholar, PubMed, and SCOPUS) for studies, reviews, case series, and case reports of patients with chronic myeloid leukemia who had JAK2 mutation. Inclusion criteria: were the presence of JAK2 mutation in CML patients with BCR-ABL1 rearrangement and, secondly, age ≥18yrs. The search included all articles published up to 20th April 2021. **Results:** A total of 25 patients met our criteria of the search. Twenty-two patients were diagnosed in the chronic phase, 2 patients in the accelerated phase, and one patient transformed to the blast phase. More females n=16 and 10 males. The mean age at the time of diagnosis was 61.3 years. 9 patients had to be switch to second-line therapy. Age and gender distribution and the presence of splenomegaly or organomegaly are almost the same. Males were slightly more than females. **Conclusion:** It is difficult to conclude that multi-kinase inhibitors are superior to imatinib in treating CML with concomitant JAK2 mutation. But the result of the reported cases showed that multi-kinase inhibitors are more likely to be successful in achieving remission and loss of JAK2 mutation. However, it is difficult to generalize the result without further studies due to the few numbers of patients and the unusual association.

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COAGULATION DISEASES

PP 18

DOUBLE HETEROZYGOTIC FV DEFECT WITH HETEROZYGOTIC FV LEIDEN MUTATION AND FV DEFICIENCY IN THROMBOSIS

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Objective: FV Leiden mutation causes activated protein C (APC) resistance and causes an increase in thrombin level.

Although moderate bleeding is seen in severe factor V deficiency, less than 1% of patients experience bleeding. Cases in which thrombosis is prominent in the presence FV Leiden mutation and FV deficiency have been reported. Here, we present a patient with FV deficiency with FV Leiden heterozygous mutation in the etiology of recurrent abortion. **Case report:** A 41-year-old female patient who applied to her primary care physician with bilateral lumbar pain upon finding INR: 1.43 (0.8-1.2) and APTT: 37.6 seconds (25-36.5), the patient was recommended to apply to our out patient clinic. The patient who described two spontaneous abortions (at the age of 25, the first in the 2nd trimester and the other in the 3rd trimester), also had a history of ecchymosis in the extremities caused by minor trauma at intervals. **Methodology:** PT, INR and APTT returned to normal with the mixing test performed on the patient (12.1 sEC, 1.03 and 28.6 sec, respectively).Afterwards, FV, which is one of the factors in the common pathway of coagulation, was found low in the examination repeated twice (12.3% and 10.2%) (N: 62-139%). The APCR studied twice in screening for thrombophilia was 1.4 and 2.4 (N: 2.61-3.32) Protein C, protein S, antithrombin III levels were within normal limits, LAC and APA were negative. **Results:** According to this result, FV Leiden heterozygous mutation was detected in the genetic thrombophilia panel. Also the patient had FV deficiency . **Conclusion:** Authors termed the coexistence of heterozygous FV Leiden mutation and type1 FV deficiency as pseudohomozygous FV Leiden mutation. In our and other studies, we concluded that thrombosis was clinically significant, where as bleeding was rare and mild. We think that prolonged PT and APTT results in patients with a history of thrombosis with FV Leidenmutation are also stimulating in evaluating FV activity.

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PP 19

BLEEDING MANAGEMENT DURING DELIVERY AND POSTPARTUM PERIOD IN GLANZMANN THROMBASTHENIA: EXPERIENCES FROM TWO CASES

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Objective: Glanzmann thrombasthenia (GT) is a hereditary bleeding disorder. The platelets lack αIIbβ3integrin and fail to aggregate. Pregnancy can also lead to isoantibody formation when fetal cells with β3integrins pass into the circulation of a mother lacking them; a consequence is neonatal thrombocytopenia and a high risk of mortality. We here present our experience with two GT patients, in which rFVIIa was our choice for bleeding prophylaxis and/or control during delivery and postpartum period. **Case report:** Case 1: A 28-year-old woman with GT was hospitalized. She was on 38th gestational week (GW). Vaginal delivery was completed with rFVIIa prophylaxis. Postpartum 5th day rFVIIa stopped. The patient discharged with a minimal vaginal bleeding. Postpartum10th day, she developed severe bleeding. GT seemed to be the only related factor. rFVIIa restarted with tranexamic acid and misoprostol. Two apheresis units of platelets were transfused. That time, rFVIIa continued 7 days. **Methodology:** Case 2: A 26-year-old woman with GT developed hematuria on 30th GW. No urinary system pathology was found. With. rFVIIa treatment, hematuria was ceased. On 39th GW, during labor she developed massive bleeding. As urgent management, 8 random units of platelet and 5 units of packed red blood cell were transfused with local vaginal compress. rFVIIa treatment was initiated. On 10th days of rFIIa with minimal vaginal bleeding the patient was discharged from the hospital. **Results:** In both of the patients, no major neonatal bleeding problem was experienced. **Conclusion:** GT patients are at risk for heavy bleeding during labor, deliver or postpartum. Platelet transfusion is simple and easy option for bleeding control. In alloimmunized patients pooled platelet should be used. The use of rFVIIa appears to be safe and relatively effective.

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PP 20

CASE REPORT OF MARGINAL ZONE LYMPHOMA DETECTED WHILE INVESTIGATING ETIOLOGY FOR HEMOSTASIS DISORDER

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Case report: In this article, we wanted to present our case in which we detected SMZL during examining for defects in coagulation tests and correlated the PT and aPTT elevation with the development of inhibitors against coagulation factors related to this disease. The PT and aPTT values of the patient diagnosed with MZL did not improve in the mixing test, and no other etiology was found. With the second course of chemotherapy, the patient's values improved.

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PP 21

ACQUIRED FACTOR XIII DEFICIENCY WITH RUNX1 MUTATION, A REPORT OF TWO CASES TREATED WITH FACTOR XIII CONCENTRATE

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Acquired FXIII deficiency has been described in association with malignancies or autoimmune disorders. We report two cases of acquired FXIII deficiency associated with hematologic malignancies. The first patient is a 60-year-old male with CMML who presented 4 weeks after confirming his diagnosis with non-traumatic anterior abdominal wall hematoma. Workup revealed FXIII deficiency. He was treated with FXIII replacement and other supportive measures. The hematoma resolved and patient was maintained on factor replacement. Unfortunately, his disease transformed to AML and he succumbed to death after starting AML therapy despite achieving complete remission. The second patient is a 24-year-old male patient post haploidentical transplant for intermediate risk AML. He developed hemorrhagic cystitis day 36 post-transplant and non-traumatic subdural hematoma on day 60 post-transplant. Workup revealed FXIII deficiency. He was treated with factor replacement and the subdural hematoma resolved with improvement of the hemorrhagic cystitis. Both patients had RUNX1 mutation which regulates expression of F13A1 in megakaryocyte this can decreased platelet expression of F13A1 in patient with RUNX1 haplodeficiency which lead to platelet dysfunction. FXIII deficiency should be considered for patient with unexplained bleeding with normal routine workup.

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LYMPHOMA

PP 22

A CASE OF MULTI REGIONAL PRIMARY MUSCLE LYMPHOMA

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Objective: Primary extranodal non-Hodgkin's lymphoma (eNHL) usually presents at an early stage, as an extranodal organ involvement along with draining lymph nodes only or the predominant site is extranodal. As an eNHL, primary skeletal muscle lymphoma is very rare. The usual clinical picture is local swelling and pain with or without systemic symptoms. MRI features are distinctive and FDG-PET/CT may help to evaluate the stage and monitor the response to the treatment. **Case report:** A 56-year-old male, presented with a one-month history of swelling and pain on his left ankle. There was no history of trauma or any physical strain. A mass lesion was palpated on the calcaneus bone. MRI showed diffuse muscle involvement. The clinical picture was not consistent with infection or hematoma. The blood cell count and biochemical investigations were within normal limits. Serology for hepatitis B, C and HIV were negative. Biopsy was decided. **Methodology:** Histological examination revealed CD19, CD20, bcl-2 and bcl-6 positive B-cell lymphoma with a Ki67 proliferation index of 95%. Myc, bcl-2, and bcl-6 gene rearrangements were not detected. Diffuse large B cell lymphoma was diagnosed. FDG-PET/CT showed lesions in multiple regions only limited to skeletal muscles but no other organ involvement. He had no adverse risk factors but bulky lesion (11cm sized lesion). After 6 courses of R-CHOP protocol, he had complete anatomic and metabolic response. **Conclusion:** Healthy skeletal muscles do not have lymphatic system. Lymphomatous involvement of muscles occurs by 3 pathways as dissemination via the haematogenous or lymphatic pathway, extension from adjacent organs, such as the bones or lymph nodes, and de novo primary extranodal disease. Most of the histology primary skeletal lymphomas have the aggressive B-cell immunophenoty. In general, treatment is similar to nodal lymphomas. In conclusion, we aimed to contribute in experience with this rare eNHL type.

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PP 23

A RARE CASE: POSTTRANSPLANT NK/T CELL LYMPHOMA

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Case report: We wanted to present our patient who was diagnosed with NK/T cell type PTLD after kidney transplantation, to contribute to the literature. Posttransplant lymphoma in NK cell phenotype (EBV unrelated) was detected in biopsy taken from the lesions that developed in mouth 11 years after kidney transplantation. It was detected as stage 1E with the examinations. As a result, early recognition of such rare cases and start treatment and reducing immunosuppressive agents are important

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PP 24

A VERY RARE CAUSE OF DIARRHEA IN A CHEMOTHERAPY-INDUCED NEUTROPENIC PATIENT: PELLAGRA

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Case report: Pellagra is a systemic disease caused by a deficiency of vitamin B3 .A 19-year-old male patient, who was diagnosed with Burkitt's lymphoma was admitted to the hematology clinic for the second cycle of R-CODOX-M chemotherapy treatment. The patient at risk of malnutrition developed dermatit,diare and demans during treatment. The

cause of diarrhea in the neutropenic patient is mostly in the form of infective diarrhea. Diarrhea due to vitamin deficiency should be kept in patients with malnutrition .

https://doi.org/10.1016/j.htct.2021.10.1034

PP 25

CAVITARY PRIMARY PULMONARY LYMPHOPLASMOCYTIC LYMPHOMA COMPLICATING HENOCH–SCHÖNLEIN PURPURA

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Introduction: Non-Hodgkin lymphoma (NHL) may occur in the chest, often as secondary involvement but occasionally as primary disease. Low-grade pulmonary B-cell lymphoma is the most frequent form. The diagnosis based on histological examination of surgical samples. Henoch–Schönlein purpura (HSP) as a systemic vasculitis typically less commonly affects adults. Triggers including infections, medications and malignancy for HSP have been recognized. **Case report:** We report a patient presenting with HSP who had primary pulmonary lymphoplasmocytic lymphoma (PPLL) as an underlying malignancy. Case: 57-year-old male patient developed chest pain with a hemoglobin level 5.9g/dL. Symptoms resolved after erythrocyte transfusions. He has been diagnosed as having type 2 myocardial infarction. The detailed investigation contributed to warm autoimmune hemolytic anemia (AIHA) diagnosis. Steroid was started. He had high eryhtrocyte sedimentation rate. Further workup revealed bilateral multiple hilar lymphadenopathies and nodular cavitary pulmonary lesions on torax CT. The clinical picture and laboratory evaluation were not consistent with invasive fungal infection and tuberculosis. Purified protein derivative (PPD) skin test was negative. Bronchoalveolar lavage did not reveal any atypical cell and culture positivity. Thoracoscopic lymph node excision was performed. Histologic investigation showed plasma cells in the paracortical area with a slight increase in kappa to lambda ratio (3:1). A fine needle aspiration biopsy of lung tissue revealed lymphoplasmocytosis. PET-CT documented cavitary nodular lesions and hilar lympadenomegalies but no other suspicious lesion. Biopsy sample from one lesion sized 18×12 mm with SUVmax 5 revealed plasma cell infiltration with an IgG kappa phenotype. PPLL was diagnosed. Meanwhile AIHA responded to steroid but recurred during dose tapering. PPLL treatment with bortezomib and rituximab based regimen was decided. AIHA went in remission but relapsed after one year with HSP associated clinical picture. He had severe abdominal pain with intestinal wall thickness. Biopsy samples from kidney showed IgA vasculitis and from skin granular type of IgA and C3 deposition in the walls of small diameter vessels in the papillary dermis. Pulse steroid followed by cyclophosphamide controlled the clinical picture. **Conclusion:** We wished to highlight that in adults presenting with HSP may be a sign of underlying malignancy relapse.

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PP 26

ANTICARDIOLIPINIC ANTIBODIES IN NON-HODGKIN LYMPHOMA

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SUMPh "Nicolae Testemiţanu"

Objective: Identification of hemostasis changes in patients with non-Hodgkin's lymphoma (NHL) and anticardiolipin antibodies (aCL). **Methodology:** The study included 83 patients (men-34, women-49) with a mean age of 63.2 years, with NHL, investigated complex, by research of lupus anticoagulant (LA) by Turbidimetry; antiβ2glycoprotein I IgG, IgM and aCL antibodies, by ELISA method. Hemostasis disorders were evaluated according to the type of NHL, stage, tumor size. **Results:** aCL were detected in 10 (12%) patients: 6 patients with aggressive type lymphoma and 4 patients with indolent type lymphoma, with advanced stage B cell NHL in 60%, mean age 52.8 years. LA was present in 80% of cases, unlike aCL IgG antibodies (10%) and antiβ2glycoprotein I IgG (10%). Hemostasis disorders were found in 6 (60%) patients: thrombotic events-at 4 (40%) patients with Mantle cell lymphoma (1 patient), Small lymphocytic lymphoma (1 patient), lymphoblastic lymphoma (2 patients). Local stage (I and II) of the lymphoma was in 75%, but with a large size of the tumor (> 11 cm), and hemorrhage at 2 (20%) patients with stage IV Small lymphocytic lymphoma, in which immune thrombocytopenia developed. **Conclusion:** The presence of antiphospholipid antibodies, in particular of lupus anticoagulant, advanced age, generalized stage, and large tumor size are risk factors for the development of hemostasis diseases in NHL patients, especially thrombosis.

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PP 27

A CASE OF STAGE 1E DIFFUSE LARGE B-CELL LYMPHOMA PRESENTED WITH KNEE INVOLVEMENT

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Case report: Bone involvement is rare in DLBCL. 70-yearold patient, applied to the orthopedics clinic dueto knee pain. Kneeprosthesis was planned. During operation suspicious nontumoral lesion with unclear borders was observed. Bone biopsy was taken from the intraoperatively detected lesion and a knee prosthesis was placed. According to PETCT and bonemarrow biopsy results, patient was diagnosed as stage 1E. Awareness of DLBCL with atypical presentation are of great importance in terms of early diagnosis

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PP 28

THE EFFECT OF COMORBIDITY AND BODY MASS INDEX ON SURVIVAL IN PATIENTS WITH MARGINAL ZONE LYMPHOMA

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Objective: Marginal zone lymphoma is a biologically and clinically heterogeneous group of indolent lymphoproliferative diseases, constituting 5-15% of all NHLs (Non-Hodgkin Lymphoma) [1]. By the World Health Organization; subgroups as extranodal marginal zone lymphoma (ENMZL, MALT lymphoma, Maltoma), nodal marginal zone lymphoma (NMZL), splenic marginal zone lymphoma (SMZL) constitute 70%, 20%, 10% of MZL (Marginal Zone Lymphoma) cases, respectively. **Methodology:** A total of 50 patients with a diagnosis of MZL who applied to our hospital between 2013 and 2021 were included in this retrospective study. All analyzes were performed on SPSS v21. The Kolmogorov-Smirnov test was used for normality control. Data are given as mean ± standard deviation for continuous variables and frequency for categorical variables. Survival times were calculated using the Kaplan Meier method. Cox regression analysis (enter method) was performed to identify important prognostic factors. p<0.05 values were accepted as statistically significant results. **Results:** The mean age of 50 people in the study group was 62.88 ± 11.50 years and ranged from 34 to 84 years. 50% of the participants were male and 50% were female . The mean follow-up period of the patients was 51.80 ± 27.47 months. It was observed that none of the parameters measured in the study, such as age, gender, body mass index, diabetes, heart disease, thyroid diseases, non-hematological malignancies, chemotherapy, and radiotherapy intake, had an effect on survival. **Conclusion:** Age at diagnosis should be considered in risk assessment of patients with marginal zone lymphoma. It is thought that the fact that the patients are predominantly in the advanced stage MZL group, and the relatively short follow-up period compared to the indolen lymphoma group, has an effect on the absence of a determining effect of comorbid diseases on mortality. Prognostic markers determined by multicenter and detailed studies are needed to provide a better prediction.

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PP 29

CASE REPORT: FOLLICULAR LYMPHOMA PRESENTED WITH CHYLOTHORAX

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Objective: Chylothorax is the leakage of chylous contents into the pleural space as a result of damage to the thoracic duct. Chylous effusion is seen often unilateral but may be bilateral rarely. Etiology includes non-traumatic and traumatic causes. While sarcoidosis, amyloidosis, superior vena cava thrombosis and congenital anomalies are non-traumatic causes, non-Hodgkin lymphomas are the most common causes.Herein, we present a follicular lymphoma patient who was presented chylothorax at diagnosis. **Case report:** A 31-year-old male patient presented with fatigue, and dyspnea. On physical examination, inguinal and axillary multiple palpable lymphadenopathies (LAP) were observed, and respiratory sounds were significantly decreased on the left side.Computed tomography imaging revealed prevascular, paratracheal, subcarinal LAPs and 5 cm thick pleural effusion in the deepest part and compression atelectasison the left. Excisional LAP biopsy revealed follicular lymphoma **Methodology:** When thoracentesis was performed and milky effusion was classified as an exudative. The high triglyceride level was consistent with a chylous effusion. After 6 cycles of R-CHOP treatment, the patient had a significant regression in the initial LAPs, while the chylous effusion persisted. When cytological examination of thoracentesis did not reveal lymphoma, the patient was followed-up. **Conclusion:** Chylothorax is associated with significant morbidity and mortality if left untreated. Control of the underlying malignancy is still the mainstay of treatment and reported as the most effective. In the literature, successful results were reported with the treatment of the underlying lymphoma. owever, it is known, chylothorax may recur and patients should be follow-up closely.

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MYELOMA

PP 30

LENALIDOMIDE ASSOCIATED İMMUNE THROMBOCYTOPENIA: A CASE REPORT

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Objective: Autoimmune cytopenia is observed in many hematological malignancies, whereas immune thrombocytopenia is rarely observed in plasma cell dyscrasias, such as multiple myeloma. On the other hand, cytopenias secondary to myelosuppression due to lenalidomide use are frequently observed,

whereas immune thrombocytopenia is a rarer complication. **Case report:** A 63-year-old female patient without any known disease was performed bone marrow biopsy in January 2019 due to anemia and high sedimentation rate. She was diagnosed with IgG-kappa type multiple myeloma and administered four cycles of bortezomib-cyclophosphamide-dexamethasone treatment. She went into remission after this treament and was then performed autologous stem cell transplantation followed by a consolidation therapy comprising 2 cycles of bortezomib-lenalidomide-dexamethasone treatment. Subsequently, she was administered lenalidomide maintenance therapy with regular follow-up visits. Isolated thrombocytopenia was observed in the patient in her last follow-up visit and was therefore hospitalized for further examination. No schistocyte was observed in the peripheral smear as well as no rouleaux formation. It was determined that her LDH (lactate dehydrogenase) levels were normal and that she did not have organomegaly. The results of the Coombs test, in addition to the results of hepatitis B, hepatitis C, HIV (Human Immunodeficiency Virus), EBV (Ebstein-Barr Virus), and ANA (antinuclear antibody) tests, which were run in order to determine whether she had any viral diseases, came out as negative. Post-transfusion purpura was ruled out in the patient as she had no history of transfusion in the last three months. She was then performed bone marrow biopsy, since her platelet count did not increase after discontinuation of lenalidomide treatment despite the fact that she was given platelet suspension transfusion. Subsequently, it was was determined that her megakaryocyte count increased, whereas her plasma cell ratio was less than 5%. In view of the foregoing, she was pre-diagnosed with lenalidomide-related immune thrombocytopenia, and was thus given 1 gr of methylprednisolone for 3 days followed by the administration of methylprednisolone at a daily dose of 1 mg/kg for 5 days. However, a sufficient increase in her platelet count could not be achieved with the said treatment. Therefore, she was administered eltrombopag therapy instead, since she was refractory to other treatments that could have been administered as a replacement treatment, such as IVIG (Intravenous Immunoglobulin), rituximab or cyclophosphamide. The patient, whose platelet count increased after the administration of eltrombopag therapy, was then discharged with full recovery. **Conclusion:** The aim of this case report is to demonstrate that lenalidomide-associated immune thrombocytopenia should also be considered when there is isolated thrombocytopenia in patients with multiple myeloma without a decrease in other cell lines.

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PP 31

CLINICAL PARAMETERS OF MULTIPLE MYELOMA PROGRESSION IN RESIDENTS OF THE GOMEL REGION OF BELARUS

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Objective: To study clinical parameters of multiple myeloma progression in residents of the Gomel region of Belarus **Methodology:** The study included 159 MM patients who were examined at the State Institution "Republican Research Center for Radiation Medicine and Human Ecology", Gomel from 2018 to 2021. The average age was 62. Female patients prevailed and amounted 57.1%. MM was diagnosed according to international criteria. The criteria for progression were determined when new foci of destruction or extramedullary lesions appeared, and at an increase in the number of plasma cells in the bone marrow> 10%. **Results:** Progression was in 10.7%(17). No differences in the immunological variant of MM. CD20 expression>20% was found 6.18 more often in progressed patients (p=0.0001). CD56>20% was 2.37 more common at progression (p=0.006). CD117>20% was 2.34 more often at progression, (p=0.116). M-protein>15 g/l was 6.22 more often at progression (p = 0.0001). Abnormal κ/λ was in 81.3% at progression (p=0.027). LDH was different (p=0.023). Kidney damage and destructive syndrome did not affect progression (p=0.797). **Conclusion:** Identification of markers of progression at the initial examination, such as excess expression of CD20> 20%, CD56> 20%, excess of M-protein> 15 g/l, abnormal κ/λ ratio can predetermine the outcome of the disease. Our findings are consistent with the literature data, but much remains unclear, for instance, cases with normal LDH values in patients with progression. This gives rise to future research.

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PP 32

THE EFFECT OF BISPHOSPHONATE USE ON TREATMENT RESPONSE AND OVERALL SURVIVAL IN MULTIPLE MYELOMA PATIENTS

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Objective: Bisphosphonates are pyrophosphate analogs with a high affinity for calcium crystals. Due to the affinity of bisphosphonates for calcium, they bind rapidly to calcium-containing hydroxyapatite crystals, especially in the resorption zone. In this way, they prevent bone resorption. In this study, we aimed to investigate the effect of bisphosphonate use on treatment response and overall survival in patients with MM. **Methodology:** All patients with MM who followed by the Hematology department of Fırat University Hospital in the last 10 years were included in this retrospective observational study. Age, gender, end-organ involvement, ISS staging, LDH level, IG subtype in diagnosis, bisphosphonate use (duration and dose), treatments, response status and survival was investigated. **Results:** Ninety-one patients, of whom 53 were

male and 38 females, were included in this study. At the time of diagnosis,14 patients with high calcium, 77 patients had normal calcium. There was no significant difference in survival between bisphosphonate intake status and IG subtypes (p>0,05). There was no significant difference in progression-free survival between the ISS category, bisphosphonate intake status, creatinine category, and IG subtypes (p>0,05). **Conclusion:** In this study, OS, and PFS in MM patients were not affected by bisphosphonate use. however, LDH level influenced both OS and PFS, the increase in LDH level negatively affected the survival.

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PP 33

INSIGHTS INTO DIAGNOSIS AND MANAGEMENT OF ADVANCED MULTIPLE MYELOMA

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Objective: The advanced stages of multiple myeloma (MM) commonly manifest a recurrent evolution, unfavorable prognosis and negative socio-economic impact. The increased rates of morbidity and DALYs, frequent complications and relapses, unfavorable socio-economic impact characterize MM as an actual issue of hematology and public health. The objective of the study was the identification of diagnostic patterns and the evaluation of short- and long-term results of treatment of the advanced stages of MM. **Methodology:** The study is a cross-sectional descriptive analysis of a cohort of 50 newly diagnosed patients with advanced stages of MM, who have been treated and followed-up at the Hematology Dept. of the Oncology Institute from Moldova during 2016-2020. The diagnosis was assessed by cytological, immunohistochemical examinations of the bone tissue and bone marrow, and ELISA immunological test of the peripheral blood. The stage was asserted in each case according to the Revised International Staging System. **Results:** The patients age ranged between 28-75 years (median - 57.7 years). MM developed mainly in persons aged 60-69 (52%) years and in rare cases under 39 years (6%). Females were 29 (58%), and males - 21 (42%). 31 (62%) patients were diagnosed in stage III, 14 (28%) - in stage II and 5 (10%) - in stage I. Immunoglobulin (Ig) G isotype was detected in 28 (56%) cases, IgA - in 12 (24%), light chains (Bence Jones MM) - in 10 (20%). Very good partial responses were achieved in 25 (50%) of patients. **Conclusion:** MM was diagnosed mostly in patients of 60-69 years, females and stage III disease. Bone marrow myeloma cells ranged between 30-67% (median - 46%). Concerning the Ig isotype distribution in MM, IgG accounted the majority of cases. Refractory chronic renal failure was the most common complication (50% of cases) in advanced MM. Targeted chemotherapy proved to be efficient in the advanced stages of MM regardless of the gender, age and disease span. Very good partial responses lasted 12-24 months.

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PP 34

CASE REPORT: COEXISTENCE OF CELIAC DISEASE AND MULTIPLE MYELOMA

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Objective: Celiac disease is a systemic disease in which the natural and adaptive immune system is affected by the effect of gluten exposure and environmental factors in individuals with genetic predisposition. Multiple myeloma; is characterized by an increase in clonal plasma cells. It is the most common hematological malignancy after lymphomas.We aimed to present a case siagnosed with celiac disease and multipl myeloma **Case report:** A 56-year-old female patient with a diagnosis of asthma and celiac disease for 1 year was referred to the Hematology department because her refractory anemia. Serum IgA level of the patient was 4490 mg/dl without renal failure and hypercalcemia.bone marrow biopsy compatible with myeloma. The patient received 6 cycles of bortezomib, cyclophosphamide, and dexamethasone and 3 cycles lenalidomid dexametazon chemotherapy.After chemotherapy, Autologous stem cell transplantation was performed. **Conclusion:** Celiac disease is an autoimmune disease, characterized by inflammation and villus atrophy in the small intestine mucosa as a result of sensitivity to gluten, resulting in malabsorption. The incidence of lymphoma and gastrointestinal system malignancy is increased in individuals with celiac disease. Multiple myeloma may also be accompanied by autoimmune diseases such as ankylosing spondylitis, scleroderma, and sjögren's syndrome. Coexistence of multiple myeloma and celiac disease is rare.

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PP 35

A RARE AND COMPLEX CAUSE OF IMPOTENCE POEMS SYNDROME

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Objective: Although plasma cell neoplasms occupy a large place in hematology practice, POEMS syndrome is very rare. Serum lambda light chain elevation and polyneuropathy, together with organomegaly, endocrinopathy, and skin lesions are the main components of the syndrome. We share our case, which we diagnosed in our clinic, with the belief that it will contribute to the literature. **Case report:** A 51-year-old male patient, who had no history of co-morbidity, drug use, or exposure to toxic substances, was started on supportive treatment in February 2021, who first developed the complaint of impotence. Later, he applied to the neurology outpatient clinic with complaints of weakness and weakness in the feet. After detecting polyneuropathy in his evaluation, IgG Lambda monoclonal gammopathy was detected in serum immune electrophoresis in his evaluation for etiology. **Methodology:** Thereupon, it started to be investigated in terms of plasma cell neoplasms. In the examinations performed, immunoglobulin levels, serum-urine kappa and lambda light chain levels, plasma increase in the bone marrow biopsies and a solitary 3.3 cm sclerotic lesion in the sacral region were detected in the PET-CT of the patient, whose ethology could not be diagnosed. **Results:** A tru-cut biopsy was taken from the sclerotic lesion of the patient, who was thought to be a plasmacytoma and a 20% monoclonal IgG lambda plasma increase was detected. In his physical examination, it was seen that he had increased lesions (Figure-1) and acrocyanosis (Figure-2) on the skin for the last 3-4 months. The patient's current complaints and laboratory results were evaluated with a preliminary diagnosis of POEMS syndrome (Table-1). **Conclusion:** POEMS syndrome is a rare disease and its exact incidence is unknown. It is frequently seen in 5-6 decades, with a median age of 51 years, and 63% of cases are male patients [1]. Chronic and excessive production of proinflammatory and other cytokines (IL-1β, TNFα, IL-6, vascular endothelial growth factor (VEGF) etc.), microangiopathy, edema, effusions, increase in vascular permeability, increase in neovascularization are important in the pathophysiology of the disease.

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PLATELET DISEASES

PP 36

IMMUNE THROMBOCYTOPENIA RELAPSE POST COVID-19 VACCINE IN YOUNG MALE PATIENT

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Case report: We report a 28-year-old Asian male patient, known for ITP and in partial remission for eighteen months, who presented to emergency department with ITP relapse (platelets count of 1 × 10^3 /uL), four days after receiving the second dose of Pfizer SARS-CoV-2 vaccine, which required treatment with intravenous immunoglobulins and dexamethasone, we discuss as well the likely underlying pathophysiology and the suggested approach in patients known for ITP who are willing to receive mRNA COVID vaccines.

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PP 37

INTEGRATED EFFICACY RESULTS FROM THE PHASE 2 AND PHASE 3 STUDIES WITH CAPLACIZUMAB IN PATIENTS WITH ACQUIRED THROMBOTIC THROMBOCYTOPENIC PURPURA

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Objective: An integrated analysis based on the Phase 2 TITAN (NCT01151423) and Phase 3 HERCULES (NCT02553317) studies with caplacizumab (CPLZ) in acquired thrombotic thrombocytopenic purpura (aTTP) was performed to assess treatment

differences on efficacy and safety outcomes that may have been undetected in the individual trials. **Methodology:** In both trials, patients with an acute episode of aTTP were randomized to receive CPLZ or placebo (PBO) in addition to therapeutic plasma exchange (TPE) and immunosuppression. All randomized patients from both studies were included in the integrated efficacy analyses (CPLZ: n=108; PBO: n=112), and those who received at least 1 dose of the study drug were included in the safety analyses (CPLZ: n=106; PBO: n=110). **Results:** CPLZ significantly reduced mortality (0 vs 4 deaths; P<0.05) and refractory TTP (0 vs 8 events; P<0.05) versus PBO and improved time to platelet count response (hazard ratio, 1.65; P<0.001). CPLZ also reduced the composite endpoint of TTP-related death, exacerbation, or any treatment-emergent major thromboembolic event during the treatment period (13.0% vs 47.3%; P<0.001) and median number of TPE days (5.0 vs 7.5 days) versus PBO. Mild mucocutaneous bleeding was the main safety finding for CPLZ. **Conclusion:** This integrated analysis provided new evidence that CPLZ prevents mortality and refractory disease in aTTP and reinforced the individual trial efficacy and safety findings. No new safety signals were identified for

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PP 38

EPIDEMIOLOGY, TREATMENT PATTERNS, AND CLINICAL OUTCOMES AMONG PATIENTS WITH ACQUIRED THROMBOTIC THROMBOCYTOPENIC PURPURA (ATTP) IN THE UNITED STATES: AN ELECTRONIC HEALTH RECORDS ANALYSIS

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Objective: Acquired thrombotic thrombocytopenic purpura (aTTP) is an ultra-rare, potentially life-threatening thrombotic microangiopathy (TMA). Data on epidemiology, disease management, and clinical outcomes are scarce and often heterogeneous. The aim of this study was to assess the epidemiology, disease management, and clinical outcomes in patients with aTTP in the United States. **Methodology:** This longitudinal retrospective observational study of the Optum-Humedica database included patients with aTTP diagnosis from October 2015 to December 2019 if they had ≥1 documented ADAMTS13 activity <10% or ≥1 aTTP episode (≥1 inpatient stay with TMA diagnosis and ≥1 therapeutic plasma exchange [TPE] during the same stay); patients with conditions that mimic aTTP were excluded. Patients were followed until loss to follow-up, end of study period, or death. All analyses were descriptive. **Results:** Among 666 patients with aTTP diagnosis, 302 (45%) had ≥1 aTTP episode. Annual incidence of ≥1 aTTP episode was 1.81/million (based on data from 2016–2019). Patients with ≥1 aTTP episode received a mean of 16.7 TPE sessions; 59% used rituximab. Among patients with ≥1 aTTP episode, exacerbations occurred in 17% (52/302); relapse occurred in 11% (34/302). Mortality rate was 25% (167/666) among all patients with aTTP diagnosis and 14% (41/302) among patients with ≥1 aTTP episode. **Conclusion:** Despite treatment with TPE and immunosuppressants, the high mortality and morbidity observed in this patient population demonstrates the need for more effective therapies to improve clinical outcomes.

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STEM CELL TRANSPLANT

PP 39

THE ROLE OF SUBPOPULATIONS OF MOBILIZED PERIPHERAL HEMATOPOIETIC STEM CELLS IN THE RESTORATION OF HEMATOPOIESIS DURING HIGH-DOSE CHEMOTHERAPY IN CANCER PATIENTS

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Objective: Mobilized peripheral hematopoietic stem cells are transplanted to cancer patients as support for high-dose chemotherapy. It is believed that the effectiveness of restoring all hematopoietic sprouts during HSC transplantation depends on the total dose of CD34+ cells. At the same time, CD34+ stem cells are a heterogeneous cell pool, including progenitor cells of different levels of differentiation and different ability to proliferate. Accordingly, it can be expected that the subpopulation composit. **Methodology:** We have studied of HSC subsets in 569 specimens of hemopoietic tissue (blood cells and LP cells) from 167 adult cancer patients and on 557 specimens of hemopoietic tissue from 263 pediatric cancer patients. Also, 61 samples of LP from 50 healthy HSC donors were studied. All patients were managed at bone marrow transplantation units of hematology malignancy and oncology department of N.N. Blokhin Cancer Research Center from 1996 to 2014. **Results:** Peripheral hemopoietic stem cells (HSC) that are transplanted to cancer patients to reduce critical pancytopenia vary in subset composition and include early polypotent precursors (CD38- and/or HLA-DR-, CD90+, CD45-negative), lymphoid precursors (CD10+, CD7+, CD2+, CD19+, CD56+), megakaryocyte- (CD61+) and myeloid-committed precursors (CD117+, CD13+, CD33+). These subsets of early and committed HSC are found in different proportions in cancer patients and normal donors. **Conclusion:** So, the pool of mobilized HSC is heterogeneous and represented by pluripotent precursors and committed HSC in different proportions that are in variable, rather sophisticated interrelations. Mobilization effect of SC individual subsets is related with disease type. To achieve fast recovery of granulocyte lineages after HSC autologous or allogeneic transplantation one should not

focus only on proportion of committed myeloid HSC: optimal HSC content to be transplanted should be in a certain balance.

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PP 40

HEMATOLOGICAL FINDINGS IN COVID-19 AND INSIGHTS TO STEM CELL THERAPY

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Objective: As the COVID-19 was spreading to all countries, its manifestations were identifying gradually, which were related to several organs. COVID-19 is associated with distinct hematological changes, increased serum inflammatory markers, and coagulopathy. **Methodology:** Most of the known COVID 19 complications are related to the patients' prognosis and mortality, particularly in those with severe disease, the issue which attract the scientists and the medical physicians all over the world to find the proper treatment for such monter, we discussed the associations between COVID-19 clinical features and complications, and secondly, its hematological findings and coagulopathy are investigated. **Conclusions:** Such associations not only may shed light on our prognostic view of patients with COVID-19 but also will entail significant therapeutic implications. One of its key implications is to utilize the mesenchymal stem cells (MSCs) to treat patients with COVID-19. Herein, this kind of novel therapy has been discussed, as well with its cons and pros points

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PP 41

OUTCOMES OF ALLOGENEIC SC TRANSPLANT IN HEMATOLOGICAL MALIGNANCY PATIENTS USING BUSULFAN 3 (9.6 MG/KG) BASED CONDITIONING REGIMEN

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King Faisal Specialest Hostpital

Objective: To study the outcomes of allo-HCT in patients with hematological malignancy who received BU3 (9.6 mg/kg) based conditioning from matched related or unrelated donors. **Methodology:** A retrospective analysis of KFSHRC-BMT Database, we identified 65 patients who received Allo-HCT between October 2005 and December 2019 at King Faisal Specialist Hospital & Research Center. The patients received SCT from full HLA matched related or unrelated donors. We excluded Mismatched MUD, Cord & Haplo-identical Stem Cell sources. **Results:** We identified 47 AML (72.3%), 8 MDS (12.3%), 8 Myelofibrosis (12.3%) & 2 CML (3.1%) patients. Acute GvHD grade II-IV and III-IV occurred in 29% and 14% respectively. Chronic GvHD occurred in 55% and was extensive in 24% of patients. With Median follow-up 60.5 months, 2 years and 5 years OS were 58.5 % and 44.1% respectively. The 2 years and 5 years DFS were 52.9% and 44.5% respectively. Cumulative incidence of relapse and NRM at 2- years were 29.5% and 17.4% respectively. Day +100 TRM were 10.7% **Conclusion:** Allogeneic SCT using BU3 based regimen appears feasible to use in patients who are not suitable for fully myeloablative (BU4) regimen. TRM, DFS & OS rate were comparable to reports from studies using BU4 based regimen, warranting prospective studies in these patients.

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PP 42

A CASE OF REFRACTORY IMMUNE THROMBOCYTOPENIA APPLIED WITH AUTOLOGOUS HEMATOPOETIC STEM CELL TRANSPLANTATION

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Case report: A 61-year-old male patient who had previously been splenectomized for immune thrombocytopenia, hospitalized with mucosal bleeding. Upon failure to respond to steroid, intravenous immunoglobulin, rituximab, danazol, azathioprine and eltrombopag treatment, autologous hematopoietic stem cell transplantation was performed to the patient. At the end of the first month, he had normal platelet count.

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PP 43

INVESTIGATION OF DRUG-DRUG INTERACTIONS INVOLVING ANTI-INFECTIVE DRUGS IN PATIENTS UNDERWENT HEMATOPOIETIC STEM CELL TRANSPLANTATION

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Objective: Drug-drug interactions are an important cause of adverse drug events. The preventable or manageable nature of drug-drug interactions puts them at the center of interventions. Since hematopoietic stem cell transplantation is a challenging and multi-drug process, drug-drug interactions are frequently encountered. **Methodology:** In our study, the drugs used by a total of 100 patients with 50 autologous and 50

allogeneic bone marrow transplants for 10 days before transplantation, on the day of transplantation and for 10 days after transplantation were examined retrospectively in terms of interaction. Two paid softwares and two free softwares were used to examine interactions. The obtained data were analyzed with Microsoft Excel program. **Results:** A total of 3805 interactions were observed in the 21-day period in 50 patients who underwent allogeneic stem cell transplantation, and these interactions occurred with the repetition of 1017 interactions in different patients. For the same period in 50 autologous stem cell transplant patients, 2906 interactions were detected, and this number occurred with 725 different interactions seen in different patients. It has been understood that anti-infectives cause serious interaction load. **Conclusion:** Hematopoietic stem cell transplantation is a period in which prophylactic or anti-infective treatment for the detected microorganism is applied intensively. Interactions of anti-infectives with each other and with other drugs in the treatment regimen are frequently encountered during the transport process. Interactions should be identified and their clinical significance should be demonstrated. It should be handled with the partnership of physician-clinical pharmacist.

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PP 44

EVALUATION OF COMMON INTERACTIONS INCLUDING ANTI-INFECTIVE DRUGS IN PATIENTS UNDERWENT AUTOLOGOUS AND ALLOGENEIC STEM CELL TRANSPLANTATION

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Objective: Hematopoietic stem cell transplantation is a challenging process involving polypharmacy. Drug-drug interactions are common due to the large number of drugs used in patients, and antiinfectives are frequently involved in interactions due to their widespread use. **Methodology:** In our study, the drugs used by a total of 100 patients with 50 autologous and 50 allogeneic bone marrow transplants for 10 days before transplantation, on the day of transplantation and for 10 days after transplantation were examined retrospectively in terms of interaction. Two paid softwares and two free softwares were used to examine interactions. The obtained data were analyzed with Microsoft Excel program. **Results:** 1017 different interactions were detected in patients with allogeneic bone marrow transplantation and 725 different interactions in patients with autologous bone marrow transplantation. It was observed that 342 interactions were common in the two transplant types. Interactions involving anti-infectives have been studied and the data showed antifungals, antibacterials and antivirals cause significant interaction load. Some interactions were found to be dependent on the transplant process. **Conclusion:** Allogeneic bone marrow transplantation and autologous bone marrow transplantation are challenging processes in which intensive drug therapy is applied. Knowing the interactions that are common to both types of transplantation and the interactions involving anti-infectives specific to a certain period of the transplantation process allows the process to be managed effectively. It is important to manage interactions in physician-clinical pharmacist collaboration

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TRANSFUSION MEDICINE AND APHERESIS

PP 45

THERAPEUTIC PLASMA EXCHANGE IN PATIENTS WITH NEUROLOGICAL DISEASES: A 9-YEAR, SINGLE-CENTER EXPERIENCE

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Objective: Therapeutic plasma exchange (TPE), is based on the removal of pathogenic substrates from plasma with replacement fluid. TPE is being used in the treatment of many neurological diseases, especially Myasthenia Gravis (MG) and Guillain Barre Syndrome (GBS). The aim of this study is to analyse the efficay and safety of TPE experience in neurological disorders. **Methodology:** We reviewed the medical records of all 59 patients who received a total of 267 therapeutic cycles between 2012 and 2021 in our tertiary care university hospital. Respond assesment was evaluated with Medical Research Council (MRC) scoring system. Neutrophil count, lymphocyte count and neutrophil/lymphocyte ratio was recorded before any treatment and 7 days after the last plasmapheresis cycle. **Results:** Of the 59 patients, 30 (50.8%) were male and 29 (49.2%) were female. Of these patients 44.1% were diagnosed with MG, 27.3% with GBS, %8.5 with Multiple Sclerosis (MS). The median number of TPE sessions per patient was 5 [1-7]. 33.9 % of patients had at least one complication that hypotension was the most seen (%22). Overall response rate was %76.3. MRC score was significantly higher in the group with response than the group without symptom regression (p <0.05). **Conclusion:** TPE is a safe and an effective treatment option in neurological diseases. TPE related side effects/complications were generally mild to moderate and manageable. Performing the TPE response evaluation with the MRC scoring system was beneficial for the reliability of the efficacy as a concrete finding.

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OTHER DISEASES

PP 46

DOES BLOOD TYPE HAVE AN EFFECT ON THE COURSE OF COVID-19?

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Objective: Predictive parameters that can affect the course of this infection have been the main topic of research since the beginning of the COVID-19 (Coronavirus disease 2019) pandemic. Since the discovery of blood groups, the effect of these on infectious diseases has always been of interest **Methodology:** To analyze the effect of ABO blood group on mortality, hospitalization duration and hematological and cytokine storm parameters in patients with COVID-19. This retrospective study was conducted on 140 patients diagnosed with COVID-19. Demographic characteristics, laboratory parameters including ABO blood group, complete blood count (CBC) parameters, biochemical tests, cytokine storm parameters, duration of hospitalization, and final status (discharge or death) were recorded. **Results:** The 140 patients included in the analysis comprised 72 (51.4%) males and 68 (48.6%) females with a mean age of 66.3±14.0 years. . Age and gender, hospitalization duration and mortality rates were similar in all blood group types. Only D-dimer values were found to be higher in blood group A compared with other blood groups. **Conclusion:** Although no difference in mortality was determined between groups, the D-dimer level was statistically significantly higher in COVID-19 patients with A blood group. Larger studies are needed to reflect D-dimer levels on the clinical course of infection, and thus on daily practice

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PP 47

RECURRENT AUTOIMMUNE HEMOLYTIC ANEMIA AFTER MRNA COVID-19 VACCINE (PFIZER-BIONTECH)

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Case report: One of the causes of autoimmune hemolytic anemia is drugs. Vaccination is the most important step in the management of the COVID-19 pandemic. After receiving the m-RNA COVID-19 (Pfizer-BioNTech) vaccine, the patient admitted with weakness and jaundice for the last three days. Laboratory results are consistent with AIHA recurrence. Splenectomy was performed after the patient stabilized with rituximab therapy. Especially newly developed therapeutic agents have a potential risk of new side effects.

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PP 48

EXTRAMEDULLARY HEMATOPOIESIS IN PATIENTS WITH TRANSFUSION DEPENDENT β-THALASSEMIA (TDT): A SYSTEMATIC REVIEW

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Objective: Thalassemia is one of the most common hemoglobinopathies, with around 5% of the world's population expected to have some degree and type of thalassemia. Beta thalassemia (BT) occurs due to a deficient production of the beta-globin chain of hemoglobin. Extramedullary hematopoiesis (EMH) is one of the complications of BT, mainly observed in minor/intermedia subtypes. EMH is the production of blood cells outside the marrow as a compensatory response to long-standing hypoxia. Due to chronic transfusions, it is not expected in patients with beta-thalassemia major (BTM). However, there are increasingly reported cases of EMH in BTM. The incidence of EMH in BTM is thought to be <1%. However, it seems that the true incidence is much higher than expected. This review aims to pool the available data and provide cumulative evidence on the occurrence of EMH in BTM patients. **Methodology:** We aim to conduct a systematic review via searching multiple electronic databases (PubMed, Scopus, Google Scholar) to identify eligible articles from any date up to December 2020. Eligible studies should report extramedullary hematopoiesis in beta-thalassemia major. Case reports, case series, observational studies with cross-sectional or prospective research design, case-control studies, and experimental studies will be included if found relevant. Two reviewers (FA and ES) will individually analyze the study quality using the statistical methodology and categories guided by the Cochrane Collaboration Handbook, PRISMA guidelines, and Joanna Briggs Institute checklist for case reports and series. **Results:** Data from 253 cases of EMH in BTM patients were extracted with mean age of 35.3 +/- 0.5 years. Mean hemoglobin at presentation with EMH was 8.2 +/- 2.1 mg/dL. Lower limb weakness was the most common presenting feature (N=23) (paraspinal EMH). Magnetic resonance imaging (MRI) was the most widely used diagnostic modality (N=226). Overall, blood transfusion was the

commonest reported treatment (N=30), followed by radiotherapy (N=20), surgery (N=15), hydroxyurea (N=12), steroids (N=6), and exchange transfusion (N=2). An outcome was reported in 20% of patients, all recovered, with no reported mortality. **Conclusion:** EMH is considered a rare phenomenon in BTM patients. It can occur in any organ system with varied clinical features. MRI can effectively diagnose EMH, and conservative management has similar results compared to invasive treatments. Larger studies, focusing on outcomes may enhance guidelines on preventive and therapeutic strategies for managing EMH in BTM.

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PP 49

LATE DIAGNOSIS OF CONGENITAL METHEMOGLOBINEMIA IN A 33-YEAR-OLD CYANOTIC PATIENT, CASE REPORT AND REVIEW OF LITERATURE

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Objective: Due to mild symptoms, congenital methemoglobinemia is rarely diagnosed and reported as a cause of the cyanosis, especially in adults. Despite the benign nature of congenital methemoglobinemia, it is crucial to keep it in the differential diagnosis list when assessing cyanotic patients, mainly if he has a normal PaO2. Patients are usually asymptomatic and are treated for cosmetic purposes, but they might suffer from severe complications if exposed to oxidative agents. **Case report:** A 33-year-old lady presented to ED with difficulty breathing and bluish discoloration gradually increased over days, without fever or cough. she mentioned having recurrent similar episodes since childhood. family history positive for similar episodes in the sister. physical examination positive for central and peripheral cyanosis, with o2sat of 88% and RR of 20, the rest of examination within normal limits. laboratory tests normal except for ht 48.9%, PO2 160 on ABGs. **Methodology:** The patient's clinical picture of cyanosis with no evidence of cardiovascular or pulmonary diseases and the discrepancy between PaO2 and O2 saturation on oximeter required thinking of methemoglobinemia as a possible diagnosis despite the patient's age and the absence of any exposures. Methemoglobin level 20.9% (0-1.5%). Hemoglobin electrophoresis did not detect any abnormal hemoglobin. The activity of NADH cytochrome b5 reductase or the level were not done. **Results:** We searched PubMed and Google Scholar, we found 22 articles with a total of 30 patients with congenital methemoglobinemia. The mean age of the patients was 25 years (range 2 days-61 years); most of them were previously healthy. Out of 30 patients, 16 were treated with ascorbic acid or methylene blue or both with improvement, 14 either were not treated or treatment not mentioned in the report. Our patient received ascorbic acid 500 mg BID orally and improved clinically and laboratory. **Conclusion:** Due to mild symptoms, congenital methemoglobinemia is rarely diagnosed and reported as a cause of the cyanosis, especially in adults. Despite the benign nature of congenital methemoglobinemia, it is crucial to keep it in the differential diagnosis list when assessing cyanotic patients, mainly if he has a normal PaO2. Patients are usually asymptomatic and are treated for cosmetic purposes, but they might suffer from severe complications if exposed to oxidative agents.

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PP 50

A RARE ASSOCIATION IN A CASE WITH HEREDITARY SPHEROCYTOSIS: SPECTRIN BETA (SPTB) AND JAK-2 MUTATION

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Case report: Five types of gene variants are seen in hereditary spherocytosis (ANK, SPTB, SPTA1, SLC4A1, EPB42). JAK2 V617F mutation; is most common seen in bcr-abl negative chronic myeloproliferative diseases. As a result of NGS performed before splenectomy, SPTB c.4973+2T> C and JAK-2 c.1849G>T p.(Val617Phe) mutations were detected. Co-occurrence of these two mutations requires special attention in terms of the management of thrombocytosis and side effects that may occur after splenectomy.

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PP 51

RETROSPECTIVE EVALUATION OF PATIENTS WITH LANGERHANS CELL HISTIOCYTOSIS FOLLOWED IN OUR CLINIC

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Objective: Langerhans cell histiocytosis (LCH) is a rare histiocytic disorder that can be especially seen in children and young adults. The clinical presentation of patients with LCH varies according to the sites of involvement. In about half of patients, the disease is limited to a single organ system and bone involvement is very common. In this study, it was aimed

to retrospectively evaluation the patients diagnosed with LCH who were followed up and treated in our clinic. **Methodology:** The data of patients over the age of 18 years who were followed up and treated in Bozyaka Training and Research Hospital Hematology Clinic between 2015-2021 were scanned retrospectively from the hospital system. **Results:** Data of 6 patients were obtained. The mean age of the patients was 33.6. There was no difference between the genders. Pain was the reason for admission in 4 patients and was the most common symptom. While the most frequently involved system was the skeletal system with 5 patients, lung involvement was seen in 2 patients. Vinblastine and prednisolone combination therapy was given to 1 patient, who developed steroid-related avascular necrosis. One patient who was planned for combination treatment **Conclusion:** LCH is a rare disease especially seen in children and young adults. It can involve the skeletal system, lungs, and other organs. The prognosis is often good with excision of the lesion or systemic treatment.

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PP 52

PILOMATRIX CARCINOMA WAS BEYOND ANY EXPECTATIONS: A CASE REPORT OF CARCINOMA CLINICIAN SHOULD BE AWARE OF IT

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Introduction: Pilomatrix carcinoma is a rare cutaneous tumor derived from follicular matrix with about 150 reported cases and it is considered as locally aggressive tumor with a tendency to recur. In addition to lymph node metastases and poor prognosis, it is non-chemotherapy responding in systemic metastasis. **Method and result:** A 37-year-old Libyan man presented with two large, coalesced nodules in the face measuring about 3*2 cm and 3*3 cm, treated as a case of lipoma by surgical excision based on clinical diagnosis, reappearing of larger nodule 9*6*4 cm involving almost all the left check, surgical excision was done with histopathological features of pilomatrix carcinoma infiltrating to the subcutaneous adipose tissue and deep striated muscle with no clear margins. Conventional radiotherapy by electron beam was started using the linear accelerating machine, with total radiotherapy dose 60 gray (Gy) in 30 fraction for six weeks. No local recurrences, nor lymph node or systemic metastasis since June 2020. **Conclusion:** Pilomatrix carcinoma must always be considered in the differential diagnosis of nodular tumors of the head-and-neck due to high recurrence rate after simple excision. Furthermore, local radiotherapy post incomplete surgical excision is the best adjuvant therapy.

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PP 53

WHAT HAVE WE EXPERIENCED WITH COVID-19 IN PATIENTS WITH HEMATOLOGICAL DISORDERS?

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Objective: Patients with cancer are considered highly vulnerable to the COVID-19 disease. However, there are still few data in hematologic patients. Some small studies have shown a high mortality on patients with hematologic malignancies and COVID-19. In this study we aim to report a single center experience of the hematologic patient population with COVID-19 disease. **Methodology:** This single centre, retrospective, cohort study included a total of 111 adult patients (aged ≥18 years) with diagnosis of neoplastic and non-neoplastic hematologic diseases between March 2020 and August 2021. Ethics committee approval was obtained from the Istanbul University Istanbul Faculty of Medicine Clinical Research Ethics Committee. Categorical variables were compared using Pearson's Chi-square test. STATA16-MP was used for the statistical analysis. **Results:** A total of 111 patients (median age:55) with hematologic disease were diagnosed with COVID19. Ninety patients had neoplastic hematologic disorder. Fourty-five patients were receiving anti-neoplastic treatment at the time of COVID19 diagnosis. A total of 21 patients (overall mortality rate:19%) died and 19 of them had neoplastic disorder. The malignancy mortality rate was estimated to be 21%. 45 of 90 cases were receiving chemotherapy. Ten of these 45 patients (22%) died due to COVID19 disease. **Conclusion:** In our study the majority of patients who died due to COVID-19 had hematological malignancies. The cytokine storm which affects the clinical outcome in COVID-19 may contribute to dismal prognosis in hematologic malignancies in which cytokine increase is a part of process. Most of the succumbed patients were relapsed refractory multiple line treated which may reflect the immune insufficiency. It seemed COVID-19 progress is mostly poor in hematologic malignancies compared otherwise healthy people.

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PP 54

A RARE CAUSE OF ANEMIA IN ADULTHOOD CONGENITAL DYSERYTHROPETIC ANEMIA

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Objective: Congenital dyserythropoietic anemia is a group of diseases characterized by ineffective erythropoiesis and multinuclear erythroblasts, mostly diagnosed in childhood. Although there are 3 main types, type II is the most common. We present our patient with congenital dyserythropoietic anemia, who was not diagnosed until the age of 49, to contribute to the literature. **Case report:** A 49-year-old male patient was admitted to our hospital with abdominal pain, weakness and yellowing of the eyes. His examinations revealed splenomegaly, cholelithiasis, anemia and hyperbilirubinemia. In the patient's anamnesis, he stated that he had jaundice and weakness since childhood, and that he knew that he had abdominal pain and spleen enlargement with advancing age. **Methodology:** Bone marrow biopsy was performed to the patient for a different diagnosis and cause. Binuclear erythrobasts were observed in the patient (fig. 1). As a result of the new generation sequencing performed on the patient who was evaluated as familial non-immune hemolytic anemia, c.1733T>C homozygous mutation in exon 15 of the SEC23B gene was detected and a diagnosis of congenital dyserythropetic anemia type II was made **Results:** Congenital dyserythropoietic anemias (CDA) represent a large group of diseases that mainly result in ineffective erythropoiesis. Morphological changes observed in the bone marrow over a long period of time were its main diagnostic features. Together with 3 main subtypes, they are examined in a total of 5 subtypes. CDA type II is most common. Clinically normal or slightly increased reticulocyte count is characterized by a variable degree of normocytic anemia. **Conclusion:** Diagnosing CDA cases: It is closely related to the clinician's ability to remember and access genetic tests, especially in advanced ages. Considering that access to genetic tests will increase in the future, many undiagnosed cases may come up. Although our treatment possibilities are limited in the current situation, future treatment methods are promising. However, studies are still needed to understand this disease and its mechanisms.

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QUALITY IMPROVEMENT / PATIENT SAFETY

PP 55

HEMATOLOGIC REFERENCE VALUES FOR HEALTHY ADULT SAUDIS

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Background: Laboratory hematological tests are widely used in clinical practice to assess health and disease conditions. Although, the International Federation of Clinical Chemistry and Laboratory Medicine (IFCC) and the Clinical and Laboratory Standards Institute (CLSI) recommended that reference ranges should be established for each region , to the best of our knowledge, no study has described the reference values of routine hematological parameters in healthy Saudi adults. **Objectives:** To provide reference values of routine hematological parameters in Saudi adults according to age and gender. Material and Methods: A total of 827 adults potentially healthy Saudi participants with age ranging from 15 to 65 years were enrolled in this cross-sectional study from the central province of Saudi Arabia, Riyadh city. **Results:** The reference values of routine hematological parameters (full blood count, hemostatic profile, and biochemical tests of serum hematinic) according to gender were provided in detail (mean, SD, range, median, upper and lower limits) after exclusion of 157 due to various reasons. No difference in any hematological values were observed in relation to age. Current study hematological parameters' reference ranges were mostly different to the universal established ranges. **Conclusion:** This novel study provides the reference ranges of routine hematologic parameters for adult Saudi population for accurate assessments and appropriate management of routine clinical care, hence, to improve quality in health care.

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PEDIATRIC HEMATOLOGY ABSTRACT CATEGORIES

COAGULATION AND FIBRINOLYSIS DISORDERS

PP 56

A CASE REPORT WITH SEVERE CONGENITAL FACTOR XIII DEFICIENCY AND AN UNCOMPLICATED PREGNANCY AND BIRTH PROCESS

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Introduction: Factor XIII deficiency is an extremely rare type among bleeding diathesis. In factor XIII deficiency, normal results of coagulation screening tests are expected. It usually does not cause spontaneous bleeding. Apart from bleeding diathesis, it may cause delayed wound healing and recurrent spontaneous abortions in women. Here, we present a 32-year-old case with severe congenital factor XIII deficiency who had an uncomplicated pregnancy and birth with regular replacement therapies. **Case report:** A 32-year-old patient with severe congenital factor XIII deficiency, who had a history of spontaneous abortion at the 11th week of her first pregnancy, applied to our center with a request for childbirth. It was learned that the factor XIII levels of the patient could not be measured, that she was using plasma-derived FXIII concentrate at a dose of 25 units/kg every time once a month, and in cases where this could not be obtained, 5 units/kg

cryoprecipitate was given instead. After the completion of the pre-pregnancy assessments, starting 3 months before the planned pregnancy and continuing for the whole pregnancy and for 3 months after birth, 25 units/kg plasma-derived concentrate at a dose of 25 units/kg was applied each time and every two weeks, and in cases where this could not be provided, the follow-up was continued by applying cryoprecipitate at a dose of 5 units / kg instead. During this whole process, FXIII levels ranged between 70% and 100%. The patient, who developed an abortion risk due to decidual bleeding in the first trimester, was hospitalized and an additional 25 units / kg plasma-derived FXIII concentrate was administered and a parenteral dose of 30 mg / kg tranexamic acid was applied until the signs of decidual bleeding disappeared. An additional 50 units/kg dose of plasma-derived FXIII concentrate was administered to the patient 30 minutes before birth who had a planned delivery by cesarean section at 38 weeks of gestation, and 30 mg/kg parenteral tranexamic acid was administered for 7 days following the delivery. FXIII level was detected 50% in the child of a healthy, 3500-g born boy. The patient and her baby, who are in the first year after birth, are followed up without any complications, and prophylactic plasma-derived FXIII concentrate or cryoprecipitate is administered to the patient once a month. **Discussion and Conclusion:** Inherited bleeding diathesis lead to an increased risk of bleeding and abortion in obstetric patients. Factor XIII deficiency is an extremely rare type among them. FXIII has a role in angiogenesis as well as hemostasis. Therefore, wound healing and tissue repair are impaired in Factor XIII deficiency. The risk of premature separation of the placenta, miscarriage especially in the first trimester, and postpartum uterine bleeding are increased in FXIII deficiency. Tranexamic acid can be used safely in obstetric patients with bleeding diathesis. It may be possible to ensure that patients with factor XIII deficiency have an uncomplicated pregnancy and delivery with regular follow-ups, regular prophylactic factor preparations, plasma replacements if they are not found, and in cases of bleeding, with additional doses of factor preparations or plasma replacement applications with tranexamic acid.

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PP 57

EVALUATION OF THE FREQUENCY OF ARTERIAL AND VENOUS THROMBOSIS AND PREDISPOSING FACTORS IN PATIENTS USING ELTROMBOPAG

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Objective: Eltrombopag is a small molecule thrombopoietin-receptor agonist used orally for the treatment.There is a high risk of thrombosis associated with the use of Eltrombopag. Our aim in this study is evaluating the incidence of arterial and venous thrombosis in patients using Eltrombopag and followed up in our center with the diagnosis of ITP, MDS and aplastic anemia, and contributing to the literature with the data of Central Black Sea by retrospectively evaluating the predisposing factors. **Methodology:** In this study, the data of 144 patients who were treated with Eltrombopag with the diagnosis of ITP, MDS and aplastic anemia at Ondokuz Mayıs University Faculty of Medicine Hematology Clinic between 2009-2019 were analyzed retrospectively. The data of the patients were obtained retrospectively from the hospital management information system. **Results:** The study included 144 patients who treated with Eltrombopag. 66 (45.8%) of the patients were male and 78 (54.2%) were female. The mean age of the patients was 54.12 ± 20.08 years. 102 (70.8%) of the patient were diagnosed with ITP, 31 (21.5%) with aplastic anemia and 12 (7.6%) with MDS. Thrombosis was observed in 7 (4.9%) of 144 patients who treated with Eltrombopag. Venous thrombosis was found in 6 (4.2%) of these patients and arterial thrombosis was found in one patient (0.7%). **Conclusion:** Eltrombopag treatment poses a risk for thromboembolic events. The treatment process should be followed closely especially in patients with known risk factors for thrombosis.

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PP 58

ETIOLOGY, TREATMENT AND FOLLOW-UP OF THROMBOSIS IN CHILDREN, ONE CENTER PROSPECTIVE TRIAL

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Objective: The aim of the study; To determine the frequency, etiological factors, treatment, long-term follow-up and recurrence rates of thrombosis in children. **Methodology:** Children with thrombosis in Ankara City Hospital between December 2018 and August 2021 were included. Patients were called or examined at 6–12-month intervals. **Results:** A total of 328 patients with a mean age of 6.9 were included. Catheter-related thrombosis was present in 52.7%.There were 14% arterial thrombosis and 59% venous thrombosis. Intracardiac thrombosis 16.2%, pulmonar thrombosis 2.4%, serebral thromboembolism %20 were detected.In the treatment, subcutaneous ondansetron (78.6%) was used mostly, but intravenous ondansetron was given in 6 patients and TPA was given 20 patients.In a mean follow-up of 15.8 months, 5 (1.5%) patients died due to thrombosis. **Conclusion:** Determining the etiological factors of patients with recurrence thrombosis is important for the duration of treatment in the follow-up.

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PP 59

THE EVALUATION OF HEALTHY CHILDREN WITH INCIDENTAL PROLONGATION OF PROTHROMBIN OR ACTIVATED PARTIAL THROMBOPLASTIN TESTS

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Objective: This cross-sectional study aimed to reveal possible hemostatic disorders in patients referred to the Pediatric Hematology Department due to the prolongation of the prothrombin test (PT) or activated partial thromboplastin test (aPTT). **Methodology:** In this study, patients aged 0-18 years without known hematologic disease were referred to investigate the incidental prolonged PT and/or aPTT were evaluated. Mixing studies were performed in patients with continued PT/aPTT prolongation in the control examinations. Coagulation factor activities were analyzed in patients with improvement in mixing study. Antiphospholipid antibodies were studied in patients whose results did not improve with mixing studies. **Results:** Coagulopathy was found in 30% of 103 patients. Lupus anticoagulant positivity was found in two patients (1.9%). The most common factor (F) deficiencies were FVII deficiency (10.6%), FXI deficiency (7.8%), FXII deficiency (7.8%), FV deficiency (0.9%), FVIII deficiency (0.9%), fibrinogen and FVII deficiency (0.9%) and von Willebrand factor (vWF) deficiency (0.9%). Coagulopathy was more common in patients with bleeding disorders in their families, and this difference was statistically significant. **Conclusion:** In our study, mild factor deficiencies were more common than expected. Coagulation factor deficiencies can be seen in the patients without any finding of physical examination, personal and family histories. There is often no evidence of bleeding in mild factor deficiencies, and the clinical significance is unknown. We recommend using PT and aPTT as screening tests, especially before a major surgical intervention is performed.

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PLATELET DISORDERS / THROMBOSIS AND ANTITHROMBOTIC THERAPY

PP 60

CHILDHOOD IMMUNE THROMBOCYTOPENIA: A MULTICENTER QUESTIONNAIRE STUDY

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Objective: A questionnaire form was prepared by the Turkish Pediatric Hematology Society- Subcommittee of Hemostasis, Thrombosis and Hemophilia to determine the current approaches in the diagnosis and treatment of childhood ITP in our country. Our aim was to share the results of this study, and to do new, national, multicenter prospective studies. **Methodology:** This form, which consists of twenty questions with multiple choices, but a brief explanation is requested when there is a different approach other than the options given, was sent to all pediatric hematologists via e-mail. **Results:** The response was obtained from 55 hematologists experienced in ITP from 47 centers in total. Due to space constraints, this summary could not present the survey questions and answers. **Conclusion:** In conclusion, the approaches for diagnosis and management of childhood ITP differ between centers.

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PP 61

THE CLINICAL PICTURE AND LABORATORY WORK-UP OF GLANZMANN THROMBASTHENIA

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Case report: We present the clinical picture and laboratory work-up of Glanzmann thrombasthenia, based on a group of 7 patients. Bleeding history was significant in all patients and included both mucosal and postsurgery bleeds. Laboratory analysis revealed decreased or absent platelet aggregation (< 10%) with all physiologic agonists (ADP, collagen, epinephrin, arachidonic acid) together with normal agglutination response to ristocetin. In three patients diagnosis was confirmed by flow cytometry.

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PP 62

THE USE OF ROMIPLOSTIM IN AN INFANT

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Case report: Immune thrombocytopenia (ITP) is the most common platelet disorder in children, peaking between the

ages of 1-7.The first line therapy consists of intravenous immunoglobulin, anti-D immunoglobulin or corticosteroids. Second-line treatment options are immunosuppressive therapy, Rituximab.Thrombopoietin receptor agonists are used, which increase platelet production in the bone marrow. Our case report on a child with refractory chronic ITP, who failed the first and second line therapy.

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PP 63

ESSENTIAL THROMBOCYTOSIS IN CHILDREN

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Objective: Sporadic essential thrombocytosis is a very rare disease in the childhood age group and its frequency has been reported as 1/1,000,000. WHO 2008 essential thrombocytosis diagnostic criteria; high platelet count for more than one year (>450 × 109/l), exclusion of reactive or secondary causes of thrombocytosis (iron deficiency, megaloblastic anemia, acute phase reactants, trauma, operation), no family history of myeloproliferative neoplasm and thrombocytosis, and WHO It can be summarized as the absence of myeloid neoplasm criteria. **Methodology:** In this study, seven cases diagnosed as sporadic essential thrombocytosis in our Pediatric Hematology clinic are presented. Six of the patients were girls and one was a boy. The median age at presentation was 13 years (the youngest 5 months, the oldest 15 years old). Application complaints: Headache, vertigo and tinnitus in adolescent children were not present in young children, they were detected incidentally. Thrombus was not detected in any patient. The median platelet count at diagnosis was 1442 × 109/l (range 963- 2438). **Results:** An increase in megakaryocytes was detected in bone marrow aspiration, no cytogenetic anomalies were found. Jak-2 (V617F) mutation was detected in one case and CALR mutation in two cases. No MPL (W515L) mutation was found in any case. In one case with a CALR mutation, a known type 2 mutation was detected, and in the other a new, previously unidentified mutation was detected. In the other four cases, no clonality was detected. Three cases with mutations and two cases with no mutations are being followed up with hydroxyurea therapy. The other two cases are using low-dose aspirin. Follow-up periods range from six months to nine years. No complications developed. **Conclusion:** Thrombocytosis is a common problem in childhood. Reactive and secondary causes are usually identified. Essential thrombocytosis is a diagnosis that should be considered after excluding other causes. Mutation studies should be performed in pediatric patients who meet the WHO 2008 criteria. While Jak-2 (V617F), CALR and MPL (W515L) mutations are seen in 90% of cases in adults, these three mutations are only seen in 25% of the childhood age group. The high number of cases with no mutations indicates that new candidate genes should be sought and studied.

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RED BLOOD CELL DISORDERS

PP 64

GARDNER DIAMOND SYNDROME: A CASE REPORT

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Case report: Gardner Diamond Syndrome (GDS) is a rare autoimmune disorder also known as autoerythrocyte sensitization syndrome represented with skin lesions. These lesions mostly occur after a triggering factor. The pathophysiology of the disease is not completely understood yet. In this case report, the characteristic features of GDS is presented; furthermore, our aim is to emphasize the effect of emotional stress during the disease.

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IMMUNODEFICIENCIES / NEUTROPHIL DISEASES

PP 65

MYELOPEROXIDASE DEFICIENCY: SINGLE CENTER EXPERIENCE

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Objective: Myeloperoxidase (MPO) is a hemoprotein expressed in azurophilic granules of neutrophils and lysosomes of monocytes. It is caused by mutations in the MPO gene on chromosome 17 and is estimated to affect 1:2000-4000 people. It is the most common inherited defect of phagocytes. Microbial killing is impaired in patients with MPO deficiency, but most patients are asymptomatic, except for diabetic patients. In this article, we aimed to present our patients diagnosed with primary MPO deficiency. **Methodology:** During the investigation for the etiology of neutropenia in the hematology department of our hospital, patients who were diagnosed with MPO deficiency were examined. In the evaluation of the patients, it was observed that the neutrophil count in the hemogram printout and the counted neutrophil count in the peripheral smear were inconsistent. We performed MPO staining with FCM from the peripheral blood samples of the patients and we found that the neutrophils were MPO negative. **Results:** A 1-day-old male patient has no additional disease (c.608A>C H mutation). C.578G>C mutation was detected in the follow-up due to ANA+ in a 6.5-year-old female patient. A c.2031-2A>C mutation was found in the 18-year-old patient who was being followed up with the diagnosis of Granulamatous Polyangiitis and his sister. A c.493del mutation was detected in an 11-year-old patient who was diagnosed with ITP 5 years ago. The noval mutation was detected in the patient followed up with the diagnosis of

retinoblastoma. **Conclusion:** MPO deficiency may occur primarily as well as secondary. A number of point germ line mutations cause primary MPO deficiency. Most patients asymptomatic without an increase in infection. Severe infectious complications were not observed in any of our patients. We wanted to emphasize that MPO deficiency should also be kept in mind in patients whose neutropenia etiology was investigated.

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LEUKEMIA

PP 66

CHARACTERISTICS AND OUTCOME OF T(8;21)-POSITIVE CHILDHOOD ACUTE MYELOID LEUKEMIA: A SINGLE INSTITUTION'S EXPERIENCE

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Objective: Compared with other cytogenetic acute myeloid leukemia (AML) groups, patients with core-binding factor AML (CBF-AML) are considered as a favorable AML risk group based on their high remission rate and survival probabilities. However, up to 30-40% of these patients can still relapse after standard intensive induction and consolidation chemotherapy. **Methodology:** From 2004 to 2020, 147 AML patients reviewed. Ten of 147 patients were followed up with t(8;21) chromosomal anomaly. The t(8;21)(q22;q22) was detected by reverse transcription polymerase chain reaction (RT-PCR) and/or floresan in situ hibridizasyon (FISH). We analyzed patients' demographic data: sex, white blood cell count at diagnosis, central nervous system status, additional cytogenetic anomaly and recurrence rates, stem cell transplant status and survival rates. **Results:** Two of 10 patients were female. The median age was 10 years (3-17 years). Median followup was 36 months (2-114 months). The mean white blood cell count of 10 patients was 21.5 ($\times$ 109/l) at diagnosis. One out of 10 patients had granulocytic sarcoma and 2 had central nervous system involvement. Additional cytogenetic anomalies were detected in 90% of the patients, of which 2 relapsed and 3 died. One patient received hematopoietic stem cell transplantation and died because of HSCT complications. **Conclusion:** Recent studies show that CBF-AML includes different groups with different clinical outcomes. We found that 50% of our patients achieved complete remission and 50% experienced relapsed disease or death. After we were able to monitor the t(8;21) level with RT-PCR, we diagnosed relapsed disease in 1 patient with additional cytogenetic anomaly. RT-PCR is essential for optimal handling of these patients to predict patients' relapse risk and to detect minimal residual disease.

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PP 67

BK-VIRUS ASSOCIATED HAEMORRHAGIC CYSTITIS CONCOMITANT WITH CHEMOTHERAPY IN AN ADOLESCENT GIRL WITH ACUTE LYMPHOBLASTIC LEUKEMIA

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Case report: Haemorrhagic cystitis (HC) is characterized by focal or diffuse haemorrhagic and inflammatory changes of the bladder mucosa. Polyoma BK virus (BKV) infection is an important underlying condition that provokes hematopoietic stem cell transplantation (HSCT)-related HC. Although commonly reported in transplant recipients, BKV associated HC, and tubulointerstitial nephritis rarely occurs in paediatric acute lymphoblastic leukemia (ALL) patients receiving chemotherapy. A 15-year-old girl diagnosed with T cell ALL, receiving high-risk chemotherapy protocol, complained about dysuria and lower abdominal pain with macroscopic haematuria. Her complaints started under meropenem, teicoplanin, amikacin, and caspofungin treatment due to neutropenic fever with severe mucositis. There wasn't any bacterial growth in the urine or blood culture. PCR analysis detected 2,2 $\times$ 109 copies/mL of BKV in urine. The antibiotics other than ciprofloxacin were discontinued. Her complaints are alleviated day by day. She did not experience any urinary symptoms or haematuria, and the BKV copy number declined to 3,3 $\times$ 107 copies/mL during follow-up.Contributing factors of BKV associated HC are highly relevant in HSCT recipients. However, patients receiving intensive chemotherapy may have similar conditions. A predisposing and potential manageable factor such as BKV should be searched in paediatric haematology practice.

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PP 68

A CASE OF METHOTREXATE-INDUCED PHOTOSENTIVITY REACTION

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Case report: Methotrexate is an essential drug effectively used in acute lymphoblastic leukemia. Doses above 500 mg/m2 are defined as high-dose methotrexate (HDMTX). Since HDMTX is known to cause serious morbidity, it is given with a standard

rescue therapy to prevent toxicity. Besides myelosuppression and mucositis, other side effects of methotrexate are hepatotoxicity, erythema, desquamation, allergic reactions and neurotoxicity. Methotrexate is also associated with radiation recall and false photosensitivity. A 10-year-old girl with pre-B ALL underwent hematopoietic stem cell transplantation two times due to marrow and central nervous system (CNS) relapse. On the follow-up, 3 months later she had a bone marrow relapse. After remission obtained with high dose chemotherapy, maintenance treatment was given due to relapse/refractory disease. One year later she had isolated CNS relapse again and treated with intrathecal methotrexate, Ara-C and dexamethasone. The patient was started on relapse/refractory maintenance therapy, and 1 g/m2 methotrexate was given every 4 weeks. Immediately after intravenous methotrexate was given to the patient in the 13th week of her treatment, she complained of burning, pain and redness in the areas that had previously been desquamated due to sunburn. No additional treatment was given, except alkaline hydration and calcium folinate, when the findings were observed. The patient was started on antihistamine therapy. Methotrexate drug level reached 0.02 umol/L at the 54th hour, the i.v. hydration was stopped. The patient's red and itchy lesions healed within 2 days by benefiting from the antihistamine. She is being followed-up at our outpatient clinic weekly chemotherapy without any sign of relapse. This sunburn-like erythema after methotrexate administration might be associated with impaired mononuclear cell response in sun-exposed tissues. Our case stated that he went to the sea two weeks ago and that the bullae secondary to the sunburn that developed afterwards peeled off after they burst. In conclusion, patients with a history of recent generalized sunburn should have their methotrexate delayed to avoid this complication.

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PP 69

UNUSUAL METABOLIC COMPLICATIONS OF CHILDHOOD ACUTE LYMPHOBLASTIC LEUKEMIA: HYPERCALCEMIA, HYPERAMONEMIA, LACTIC ASIDOSIS

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Case report: We present three children with precursor B acute lymphoblastic leukemia (ALL). The first one had malignancy associated hypercalcemia at diagnosis. The second one experienced hyperamonemia during induction. Both of them had been treated successfully. The last one had refractory leukemia and died because of lactic acidosis due to extensive infiltration of the liver by tumor cells. The rare but potential fatal metabolic complications of ALL needs high clinical suspicion and prompt treatment.

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PP 70

CENTRAL HYPOTHROIDISM DUE TO ACUTE LYMPHOBLASTIC LEUKEMIA WITH CENTRAL NERVOUS SYSTEM INFILTRATION

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Case report: We describe a five-year-old girl with high risk B precursor acute lymphoblastic leukemia with central nervous system involvement. Laboratory tests suggested the presence of central hypothyroidism (thyroid-stimulating hormone [TSH]: 0.30 mU/ml, normal range 0.64–6.27 mU/ml; serum free thyroxine [FT4]: 0.70 ng/dl, normal range 0.86–1.4 ng/dl). Magnetic resonance imaging detected heterogeneous contrast enhancement of pituitary gland in addition to cerebral and cerebellar atrophy.

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PP 71

BONE AS A SITE OF EXTRAMEDULLARY DISEASE IN ACUTE LYMPHOBLASTIC LEUKEMIA

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Case report: We describe 3 children with pre B acute lymphoblastic leukemia (ALL).The first two were evaluated in orthopedic clinics because of limping due to ischium involvement and bone fracture suspicion due to involvement of upper limb bones.As a result of normal hemograms in both cases, leukemia diagnosis delayed.The third patient experienced bone marrow and vertebral column relapse of ALL presenting with nuchal rigidity mimicking meningitis.Bone should be considered as a site of extramedullary disease.

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PP 72

A CHALLENGE IN PEDIATRIC ACUTE LEUKEMIA TREATMENT: UNEXPECTED, PROLONGED CYTOPENIA. IS IT BE CALLLED 'INCOMPLETE HLH'?

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Objective: The diagnostic criteria set for HLH may look like symptoms of cancer or a severe bacterial infection common occurring when patients are immunosuppressed due to

ongoing chemotherapy. Features similar to immune dysregulation in HLH also occur during pediatric acute leukemias. This immune dysregulation results unexpected cytopenias, fever, and splenomegaly in children with acute leukemia. We aim to analysis the pediatric acute leukemia pateints who had unexpected, prolonged cytopenias, and did not full-fill the HLH-2004 criteria set and received pulse methylprednisolone therapy up to three days **Methodology:** Data was analyzed retrospectively. The diagnosis of HLH was defined according to the HLH-2004 criteria set but two criterias (NK cell activity and sCD25 level) of HLH diagnosis were not studied due to lack of necessary equipment. Treatment response was defined as increasing neutrophil count above 500/mm3 in patients within the first seven days. **Results:** 12 patients received steroid for unexpected, prolonged cytopenias. Five or six of six criteria was not found. Four criteria in four, three criteria in five and two criteria in three patients was determined. All patients had cytopenia at least two of three lineages in peripheral blood, one of which was neutropenia. Hemophagocytosis in bone marrow sample was detected in eight patients. Ten patients (87%) recovered within the first seven days. Seven of nine thrombocytopenic patients recovered. **Conclusion:** In this report, the efficiency of short-term steroid treatment was demostrated in patients with unusual cytopenias who did not full-fill HLH criteria.

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PP 73

EVALUATION OF VACCINATION RESPONSE IN CHILDREN AFTER TREATMENT FOR ACUTE LEUKEMIA

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Objective: Our study aims to evaluate the patients' immunity regarding childhood vaccination after leukemia treatment and determine the vaccines that require additional doses. **Methodology:** Sixty-six patients who were followed up with the diagnosis of ALL and AML between 2013 and 2016 were included in our study. The patient's gender, age at diagnosis, leukemia type, leukemia risk groups, vaccination status before chemotherapy (CT) and serologies of hepatitis A, hepatitis B, varicella, measles, rubella, mumps at the end of CT were recorded. **Results:** At the end of the treatment, loss of protective antibody response against hepatitis A (47.4%), hepatitis B (68.2%), varicella (64.2%), measles (45.5%), rubella (43.9%), and mumps (50%) vaccines were shown. Loss of protective antibodies against hepatitis A (66.7%), hepatitis B (100%), varicella (100%), measles (100%), rubella (91.7%), and mumps (91.7%) in high-risk ALL patients was higher than patients in standard-intermediate risk ALL. **Conclusion:** Loss of humoral immunity against hepatitis A, hepatitis B, varicella, MMR was shown in patients with leukemia at the end of the treatment. Due to the significant decrease in hepatitis B and MMR protective antibodies in the high-risk group, we recommend patients with leukemia who have completed chemotherapy to be vaccinated with hepatitis B vaccine three months and MMR vaccine six months after the treatment.

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PP 74

PONATINIB EXPERIENCE IN A PEDIATRIC CHRONIC MYELOID LEUKEMIA PATIENT

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Objective: Chronic myeloid leukemia (CML) is rarely seen in children. The development of myelofibrosis in CML is not uncommon and is associated with a poor prognosis. In cases unresponsive to treatment, tyrosine kinase mutation should be checked for drug resistance, second generation tyrosine kinase inhibitor (TKI) drugs (dasatinib/nilotinib) should be switched to and a suitable donor for bone marrow transplantation should be sought. Third-choice TKI can be used in children who are unresponsive to treatment and do not have a suitable donor. **Materials and Methods:** Experience of third-choice TKI(ponatinib) in a child with CML diagnosis due to unresponsiveness to treatment. **Results:** A 5.5-year-old female patient with no known disease was referred to us because of hepatosplenomegaly (liver 5 cm, spleen 10 cm). There was no laboratory disorder except for anemia (hgb 8.9 g/dL) and high LDH (1104 U/L). WBC was $11.1 \times 10^3/\mu$L neu $6.92 \times 103/\ \mu$L plt 304000/μL. Peripheral smear showed leukoerythroblastosis. Bone marrow biopsy result was evaluated as compatible with myelofibrosis and an increase in blast rate from 8% to 18% in the bone marrow. The patient was diagnosed CML accelerated phase with cytogenetic (46,XX,t(9:22)(q34;q11))and translocation (t(9:22)- p210,BCR/ABL positive) results and. Imatinib treatment was started at 400 mg/m^2.The copy number of BCR-ABL p210 checked before treatment was 72% IS. However, the patient developed febrile neutropenia, and imatinib dose reduction (< 200 mg/m^2) and interruption were required in the follow-up.Under imatinib treatment, BCR-ABL copy number was 16%IS at 1 month, 11%IS at 3 months, and 95%IS at 5 months. Due to the increase in the BCR-ABL copy number, nilotinib was switched to as a second-choice TKI(230 g/m2/dose, in 2 doses).No mutation could be detected in the c-ABL gene, which was examined for tyrosine kinase resistance. HLA groups were sent from the family and compatible donors were not found. Due to severe neutropenia in the follow-up, nilotinib could be continued at 50% dose. Under nilotinib treatment, the BCR-ABL copy number was 13% IS at 1 month, 10% IS at 2 months, and 31% IS at 3 months. The patient was started on ponatinib (18 mg/m^2/day)

as a third choice TKI. However, due to the deep neutropenia of the patient, it was possible to continue with a dose of 10 mg/m^2 from the 2nd week. With this dose, the neutrophil is around 0.8-1 $\times$ 10^3/μL. Under ponatinib treatment, BCR-ABL copy number was 6.6% IS at 1 month, 0.8% IS at 3 months, 0.09% at 5 months, and 0.05% at 6 months. No significant side effects were observed except neutropenia. **Conclusion:** There is no approved treatment in pediatric CML cases where the second choice TKI fails and there is no donor for transplantation. FDA approval for ponatinib in adult patients was obtained in December 2020. Ponatinib is a natural or mutant pan-BCR-ABL mutation inhibitor. It also inhibits VEGFR, FGFR, PDGFR,EPH and SRC kinases as well as KIT,RET,TIE2 and FLT3. The use of ponatinib should be evaluated by monitoring side effects/tolerance in pediatric cases where there is no other treatment option, and there is a need for studies on this subject.

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INHERITED BONE MARROW FAILURE DISEASES

PP 75

INVESTIGATION OF SALIVARY miR-9, miR-34a ve miR-196a LEVELS IN FANCONI ANEMIA AND ORAL SQUAMOUS CELL CARCINOMA PATIENTS

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Objective: Fanconi anemia (FA) is a rare bone marrow deficiency syndrome due to the DNA repair gene mutations, and Oral Squamous Cell Carcinoma (OSCC) is seen more frequently in FA patients than in the general population. The dysregulation of PI3K and Wnt signaling has been implicated in OSCC pathogenesis and abnormal expressions of miRNAs (a class of non-coding small regulatory RNAs) associated with these signaling pathways has been reported in OSHK patients. Salivary miRNAs are valuable biomarker candidates for OSCC development and prognosis. In this study, salivary levels of miR-9, miR-34a and miR-196a miRNAs related to PI3K and Wnt signaling pathways were examined in OSCC and FA patients and compared with the healthy control group. **Methodology:** Saliva samples were collected from 89 subjects including 25 OSCC patients, 24 FA patients and 40 healthy controls. Total RNA was isolated using Quick-RNA Miniprep Kit (Zymo Research) due to the kit instructions. cDNA was generated with miRCURY LNA miRNA PCR Assay (Qiagen, Hilden, Germany) and Quantitative real-time PCR was performed with miRCURY LNA SYBR Green PCR Kit (Qiagen, Hilden, Germany) according to the manufacturer's protocol. For the normalization of the expression levels of each miRNA, the mean expression U6 SnRNA was used as reference. The ΔΔCt value and the normalized miR-9, miR-34a and miR-196a salivary levels were calculated with Livak Method. **Results:** Our results showed that miR-9 and miR-34a levels in OSCC patients were significantly lower compared to healthy control groups (p= 0,01 and p= 0,012), and there was no significant difference in miR-196a levels (p> 0,05). In FA patients, miR-9 and miR-34 levels were lower than in control groups, likewise the OSCC patients (p =0,017 and p =0,014). There was no significant difference between miR-9, miR-34a, and miR-196a levels of FA patients and OSCC patients (p >0.05). **Conclusion:** According to our results, low levels of miR-9 and miR-34a in saliva are biomarker candidates that may be important for OSCC development. In FA patients, close follow-up of the levels of miR-9 and miR-34 would be appropriate considering OSCC development. Further studies are needed to confirm the potential of miR-9 and miR-34a as biomarkers for OSCC.

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PP 76

A NOVEL MISSENSE MUTATION OUTSIDE DNAJ DOMAIN OF DNAJC21 IS ASSOCIATED WITH SHWACHMAN-DIAMOND SYNDROME

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Shwachman-Diamond Syndrome (SDS) and related bone marrow failure disorders are characterized by early onset pancytopenia with a hypocellular bone marrow, short stature, and pancreatic insufficiency, along with an increased risk for myeloid malignancies. Recently, several cases with an SDS-like syndrome have been reported to harbor mutations in the DNAJ domain of *DNAJC21*. Here, we report an intriguing case

of a 13.5 years-old female born to Turkish consanguineous parents with a novel missense mutation occurring outside the DNAJ domain of the *DNAJC21* gene. Whole-exome and Sanger sequencing confirmation revealed a homozygous missense mutation in *DNAJC21* gene c.463T>C, p.W155R which was considered as pathogenic in in silico analyses. Initially, this patient's vague and atypical symptoms led to uncertainty of the underlying diagnosis. Upon confirmation of the genetic mutation, a number of functional studies such as diepoxibutane test, proliferation test from peripheral blood mononuclear cells, and cytokinesis-block micronucleus cytome assay performed with the patient cells confirmed the likely diagnosis of an SDS-like syndrome attributable to DNAJC21 dysfunction. Through the analysis of this rare case, we illuminate the pleiotropic features of this unique bone marrow failure syndrome and emphasize the paramount role of genomic testing to discriminate a range of closely related bone marrow failure disorders.

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STEM CELL TRANSPLANTATION

PP 77

THE ROLE OF THERAPEUTIC DRUG MONITORING OF INTRAVENOUS BUSULFAN FOR PREVENTION OF SINUSOIDAL OBSTRUCTION SYNDROME IN CHILDREN

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Objective: Busulfan is a widely used alkylating drug for conditioning of hematopoietic stem cell transplantation (HSCT). Higher exposure of Bu is associated with toxicity and (sinusoidal obstruction syndrome) SOS, whereas lower exposure is associated with graft failure or relapse risk. Therapeutic drug monitoring (TDM) has been recommended to overcome these issues. We aimed in this study to compare HSCT outcomes in children with and without TDM of Bu. **Methodology:** This retrospective study conducted at our Transplantation Unit between 2012 and 2021. Patients aged 0-18 y underwent HSCT who received Bu-based conditioning and completed post-transplant +100 days included in the study. Data were collected including demographic information, primary diagnoses, conditioning regimen, graft-related data, dose of Bu, time to neutrophil and platelet engraftment, presence of SOS, acute or chronic GvHD, and clinical outcomes. SPSS 18.0 was used for statistical analysis. **Results:** 172 patients (59 girls, 113 boys) with a median age of 4.70 years (IQR 2.41-10.01) were enrolled in the study. TDM of Bu was performed in 126 patients. 32 patients (19%) developed moderate or severe SOS. Incidence of SOS was significantly higher in the group without TDM. A multivariable analysis showed that presence of acute GVHD and 2 or more alkylating agents in conditioning regimen were associated were SOS. HSCT related outcomes, relapse, OS and EFS did not different between two groups. **Conclusion:** To improve treatment outcomes of Bu, TDM and dose adjustment, following the first dose, has highly recommended regardless of the dosing guideline was used. We also demonstrated the incidence of SOS decreased in patients with TDM, but other HSCT related outcomes were not influenced. Optimal cumulative Bu exposure canbalance between efficacy and toxicity of HSCT in children.

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PP 78

A CASE OF POLYCYTHEMIA DIAGNOSED AS HEMOGLOBIN ANDREW-MINNEAPOLIS

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Objective: Polycythemia is a rare condition in which an increase in erythrocyte mass is observed. It can be primary or secondary. Primary polycythemia occurs as a result of congenital or acquired mutations that regulate erythroid development. Although secondary polycythemia is mostly seen secondary to hypoxia due to cardiac/pulmonary reasons, it also develops as a result of congenital mutations. Globin gene mutations that increase the affinity of hemoglobin for oxygen are one of these rare causes. **Materials and Methods:** We present a male case who was referred to us for polycythemia. **Results:** A 15-year-old male patient with no known disease was referred to us after his school screening revealed high hemoglobin (18 g/dL). In complete blood count, other series were normal (wbc $5.8 \times 10^3/\mu$L neu $3.3 \times 10^3/\mu$L plt $174 \times 10^3/\mu$L), bilirubins and liver functions were within normal limits. On physical examination, conjunctiva and hands were pletoric, there was no hepatosplenomegaly, intermittent headaches were present, and neurological examination was normal. The patient was examined for the etiology of polycythemia. Hyperchromic erythrocytes were found in peripheral smear, no signs of hemolysis were observed. EPO level (8 mIU/ml) was in the normal range and JAK2 (V617F) mutation was negative. The patient's cardiac and pulmonary functions were within normal limits. Hemoglobin electrophoresis was sent from the patient. HbA was determined as 59.2, HbA2 2.8, Variant Hb 38. c.435G>T mutation was detected in the HBB genetic analysis, and this was considered to be compatible with Hemoglobin Andrew-Minneapolis. It was learned that the patient's mother and her cousins had similar findings, and some of them had undergone phlebotomy. Phlebotomy was planned in the presence of the patient's hemoglobin value > 18 g/dL and clinical findings. Phlebotomy was

performed 3 times, aspirin was not started because there was no history of thromboembolism. In our 1-year follow-up, the hemoglobin value was 17-17.5 g/dL. **Conclusion:** More than a hundred globin gene mutations associated with erythrocytosis have been described. Hemoglobin Andrew-Minneapolis mutation is one of them. Hemoglobin's affinity for oxygen has increased and EPO level is normal/increased. Due to the low number of cases, treatment recommendations were prepared based on polycythemia vera guidelines. Patients should be closely monitored in terms of hyperviscosity and thromboembolism, aspirin prophylaxis and phlebotomy are recommended according to symptoms. While investigating the etiology of polycythemia, hemoglobin electrophoresis is necessary, although it is very rare.

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LYMPHOMAS

PP 79

THE SMALLEST PRIMARY BONE LYMPHOMA

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Case report: Primary lymphoma of bone (PLB) is a rare malignant condition with lymphocytic infiltration of the bone; it accounts for 2–3% of all primary bone tumours in adults and children .Here we report a little girl with isolated PLB of B cell lineage focussing on diagnosis, evaluation and treatment strategy. Our case can help to get acquaintance with PBL,it should be taken into consideration as a different diagnosis for osteolytic lesions of bone.

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PP 80

MRI FINDINGS OF BONE MARROW AT THE BEGINNING OF LEUKEMIA

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Ankara Şehir Hastanesi

Case report: Pediatric ALL/lymphoma (LBL) is a clonal hematopoietic stem cell disorder which's highly aggressive. There is an overlap between ALL and LBL which shouldn't cause delay in the diagnosis of each other.We'll describe a patient who presented with leukemia symptoms such as fever,bone pain, who didn't have obvious atypical cells in his peripheral smear,BM aspirationand involvement in scintigraphy but had diffuse bone marrow(BM)involvement in the lower extremities in his MRI. BM biopsy showed ALL/LBL.

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PP 81

THREE CASES WITH BURKITT LYMPHOMA PRESENTING WITH CHOLESTASIS

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Case report: Cholestasis secondary to neoplasm is rare in children. It is also rare in Burkitt lymphoma and may be cause to treatment delay. We report 3 cases diagnosed with Burkitt lymphoma with cholestasis. All patients had jaundice and high direct biluribin levels. They were given LMB chemotherapy protocol. After COP chemotherapy, cholestasis disapperead rapidly in all patients. In conclusion, cholestasis at initial resolves rapidly with chemotherapy despite high liver function tests in Burkitt lymphoma.

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BRAIN TUMOURS

PP 82

HIGH GRADE GLIOMA OF CENTRAL NERVOUS SYSTEM: SINGLE CENTER TREATMENT EXPERIENCE

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Objective: To evaluate characteristics and treatment responses of patients with high grade gliomas (HGG) in our center. Medical files of patients with malignant CNS tumors between 1987-2020 were analyzed retrospectively. There were 44 patients with HGG. **Case report:** Diagnosis of patients as follows: 21 pons glioma, 2 anaplastic astrocytoma, 11 anaplastic ependimoma, 7 glioblastoma multiforme, 1 glioblastoma, 2 gliomatosis cerebri. The median age at diagnosis was 6,5 yrs (7 – 17 yrs), M/F:25/19. Age distribution: <5 yrs 12 patients, 5-10 yrs 18 patients, 10-18 yrs 14 patients. The most frequent complaints for pons gliomas: cranial nerve paralysis

(52%), visual impairment (48%), headache (38%), power loss (43%) and speech disorder (30%). **Methodology:** Surgery was performed to extrinsic component of mass in 3 patients of pons gliomas.For other HGG: 7 subtotal resection and 16 gross total resection had performed.7 patients died before RT. And other 37 patients received radiotherapy. RT total doses varied between 50-60 Gy.7 patients were not received chemotherapy, 3 of them died before chemo, and others received only RT. For other HGGs, platin based regimens used for the first line treatment. Temozolamide, bevacizumab, irinotecan as the other options. **Results:** Median progression free survival time was 6 mos (2weeks-25 mos) for pons gliomas, for other gliomas median progression free survival time was 14 mos(0 -74 mos). For pons gliomas: Event free survival rate for 6 mos was 75%, for one year 17%;one year, 18 mos, and two years overall survival rates were 84%,52% and 10%respectively.For other HGGs: Event free survival rate for one year and two years were 57% and 17% respectively. One year and two years overall survival rates were 73% and 36% respectively. **Conclusion:** High grade glioma is a group of tumors in which still the helplessness experienced in treatment. Despite radiotherapy and chemotherapy, prognosis is very poor. The progression free and overall survival rates of patients were similar to literature. With new developments in molecular pathology, as the use of molecular target therapies, the progression free survival rates newly will improve.

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PP 83

ONC 201 PRACTICE IN DIFFUSE MIDLINE GLIOMA (H3K27M MUTANT)

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Objective: Diffuse Midline Gliomas (DMG), H3 K27M-mutant have the poorest prognosis among all pediatric high-grade gliomas, with a median survival of 9-11 months. Although radiotherapy (RT) is standard treatment for these tumors, unfortunately there has been no approved and effective treatment which completely diminishes the tumor yet. In our clinic, we started an up-to-date approach to manage DMG, which is adjuvant fractionated external beam radiotherapy along with ONC 201 after tissue diagnosis. **Methodology:** Between January 2016 and June 2021, a total of 11 patients with H3 K27M-mutant diffuse midline glioma, diagnosis confirmed by Next-Generation Sequencing (NGS) were enrolled in study. All patients received ONC201 orally once a week following radiotherapy. Safety, and radiological evaluations were regularly assessed every 12 weeks. **Results:** Among the 11 patients, the median age of diagnosis was 5. Seven (63.6%) patients were male and 4 (36.4%) were female. Primary lesions were localized in the pons in 5 (45.5%) patients, unilateral thalamus (2 on the left, 1 on the right) in 3 (27.3%) patients, bilateral thalamus in 2 (18.2%) patients, and temporo-insular in 1 patient (9.1%). Median progression-free interval was 10 months and median overall survival was 16 months. **Conclusion:** Diffuse midline glioma has dismal prognosis. None of the treatment options made any dramatic changes in disease course during last 30 years. In our series, diffuse midline glioma patients who had ONC201 tend to have few months more progression free and overall survival (16 vs 11 months) in comparison to patients who had classical treatment in literature. As a neurooncology team, we strongly advocate to obtain tissue samples from diffuse tumors, to establish definite diagnosis and to perform NGS

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NEUROBLASTOMA

PP 84

PARATESTICULAR INVOLVEMENT IN NEUROBLASTOMA

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Case report: Neuroblastoma is 7-10% of all pediatric cancer cases. Primary testicular and paratesticular neuroblastoma is very rare in the literature. We aimed to present our experience with a 4-year-old patient with an abdominal and right paratesticular mass. The patient's imaging revealed extensive lung and bone metastases. In the diagnostic biopsy, the primary tumour consistent with poorly differentiated neuroblastoma and the right paratesticular mass biopsy revealed neuroblastoma metastasis.

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BONE TUMOURS

PP 85

PRIMARY EWING'S SARCOMA OF SPHENOID BONE EXTENDING TO BRAINSTEM; AN ORDINARY TUMOUR AT AN EXTRAORDINARY LOCATION AND INVOLVEMENT

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Ankara Şehir Hastanesi

Case report: Ewing's sarcoma (ES) is the 2nd primary bone tumor of childhood, mostly located in the lower extremities. The incidence of primary cranial ES is <1%. Our patient is 9 years old female who has intracranial primary ES extending from the sphenoid bone corpus to the clivus border. This is a rare case of childhood that's originating from the sphenoid bone and spreading to such a very large intracranial area. Our aim is to provide data on the clinical and therapeutic course of a rare case.

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SUPPORTIVE CARE AND PALLIATIVE CARE

PP 86

ACTINOMYCES ODONTOLYTICUS: A RARE CAUSE OF PEDIATRIC FEBRILE NEUTROPENIA

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Case report: Actinomyces spp. are gram-positive bacilli found in humans as a common flora of the oropharynx, gastrointestinal tract, and urogenital tract. We describe a case of Actinomyces odontolyticus bacteremia in an Ewing sarcoma and febrile neutropenic girl. This is the first time that bacteremia due to A. odontolyticus has been reported in a pediatric cancer patient. . This case suggests that A. odontolyticus should be regarded as a possible cause of bacteremia in neutropenic pediatric cancer patients.

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TUMOR BIOLOGY, IMMUNOLOGY AND IMMUNOTHERAPY

PP 87

THE EFFECT OF NIVOLUMAB IN PEDIATRIC MALIGNANT TUMORS: A SINGLE CENTER EXPERIENCE WITH EIGHT PATIENTS

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Objective: The programmed cell death 1 (PD-1) receptor is an immune checkpoint receptor expressed by activated T cells. PD-1 inhibits the immune system by binding to its ligands expressed on tumor cells. Nivolumab and pembrolizumab are some of the monoclonal antibodies that inhibit the PD-1. We present our experience with eight cases which were treated with nivolumab for different malignant diseases in our clinic. **Methodology:** A total of eight patients (5 girls, 3 boys) aged between 4 and 16 years were treated with nivolumab at 3mg/kg/dose approximately twice a week in Erciyes University Pediatric Hematology clinic between 2019-2021. Nivolumab treatments of seven patients were given median 11 (4-32) doses and discontinued due to progression at a median 6 months (2-17 months). **Results:** Four patients were diagnosed with miss match repair syndrome in addition to their malignant disease. Non-Hodgkin lymphoma (two with T-cell and one with histiocyte-rich B-cell) in three patients, brain tumor (pons glioma, midline glioma, glioblastoma multiforme) in three patients, germ cell tumor (yolk salk, immature teratoma) in two patients, one patient had colon adenocarcinoma in addition to brain tumor. Except for nausea in a patient, no drug-related side effect was observed in patients. **Conclusion:** Nivolumab was well tolerated in patients with CMMRD syndrome with some transient partial responses. There is a risk of developing secondary cancer in patients with CMMRD syndrome. Further studies are needed due to the limited use in children.

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PP 88

A CASE DIAGNOSED WITH FOUR DIFFERENT TUMORS

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Case report: Chromosomal breakage syndromes are characterized by cancer predisposition. Here we present a 27-month-old female with Fanconi Aplastic Anemia diagnosed with 4 tumors. Imaging showed brain mass causing the shift, liver mass and left kidney mass. She had diagnosed with high grade intracranial tm, wilms tm and hepatocellular ca. Because of refractory pancitopeni, she underwent HSCT. After 2months she developed intracranial embryonal tumor. The patient died with progression. Genetic tests revealed no mutation.

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