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Scientific Tracks & Abstracts

Day 1

Shimin Hu, J Blood Disord Transfus 2017, 8:5 (Suppl)
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Cytogenetic landscape and impact in blast phase of chronic myeloid leukemia in the era of tyrosine kinase inhibitor therapy

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The landscape of additional chromosomal alterations (ACAs) and their impact in chronic myeloid leukemia, blast phase (CML-BP) treated with tyrosine kinase inhibitors (TKIs) have not been well studied. Here, we investigated a cohort of 354 CML-BP patients treated with TKIs. We identified +8, an extra Philadelphia chromosome (+Ph), 3q26.2 rearrangement, −7 and I (17q) as the major-route changes with a frequency of over 10%. In addition, +21 and +19 had a frequency of over 5%. These ACAs demonstrated lineage specificity: +8, 3q26.2 rearrangement, I (17q) and +19 were significantly more common in myeloid BP and −7 more common in lymphoid BP; +Ph and +21 were equally distributed between two groups. Pearson correlation analysis revealed clustering of common ACAs into two groups: 3q26.2 rearrangement, −7 and I (17q) formed one group and other ACAs formed another group. The grouping correlated with risk stratification of ACAs in CML, chronic phase. Despite, the overall negative prognostic impact of ACAs, stratification of ACAs into major vs minor-route changes provided no prognostic relevance in CML-BP. The emergence of 3q26.2 rearrangement as a major-route change in the TKI era correlated with a high frequency of ABL1 mutations, supporting a role for TKI resistance in the changing cytogenetic landscape in CML-BP.

Biography

Shimin Hu is currently a Faculty Member at The University of Texas MD Anderson Cancer Center. He has received his MD from Peking University and PhD from University of Michigan. He did his Pathology Residency training at Hartford Hospital, CT and Hematopathology Fellowship training at The University of Texas MD Anderson Cancer Center. He has published about 60 papers during past three years in highly-regarded journals, including many in Blood and Leukemia.

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Notes:

Jianrong Wang, J Blood Disord Transfus 2017, 8:5 (Suppl)
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Autophagy in hematopoiesis and leukemogenesis

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Autophagy, unique protective cytoplasmic machinery involving lysosomal degradation, is required for hematopoietic stem cell multilineage differentiation that protects against leukemogenesis, but the underlying mechanism is unknown. We uncovered a mechanistic link between autophagy and hematopoietic stem cell differentiation. Physiological autophagy activity was found to be inversely correlated with Notch signaling during hematopoietic stem cell differentiation whilst pathologically low autophagy activity was associated with upregulated Notch signaling in dysfunctional hematopoietic stem cells of leukemia patients. Furthermore, we show that autophagy directly degrades intracellular Notch whereas conditional autophagy defects lead to elevated intracellular Notch and its downstream targets as well as failed hematopoietic stem cell differentiation. Hematopoietic stem cell differentiation potential, however, was restored in an autophagy defective system when Notch signaling was pharmacologically or genetically abrogated. Finally, we identified mitochondrial reactive oxygen species (ROS) as an upstream trigger for autophagy to physiologically downregulate Notch signaling and drive hematopoietic stem cell differentiation. Hence, in the cause of development when mitochondrial ROS are progressively produced, autophagy is triggered by the ROS to target Notch signaling to sustain hematopoietic stem cell differentiation. Autophagy dysfunction is attributed to the differentiation blockades which are often the cause of hematological malignancies. Therefore, our present findings provide a critical insight into the current mechanistic understanding of physiological and pathological connections between autophagy and hematopoietic stem cell differentiation, thereby proposing a novel mechanism by which autophagy maintains hematopoiesis and protects against leukemogenesis.

Biography

Jianrong Wang earned his PhD degree in The Shanghai Institute of Biochemistry, Chinese Academy of Sciences in July of 1997. In October of that year, he was appointed as a Research Professor in a municipal institute in Shanghai China. After moving to US in January of 1999, he conducted research primarily at Cornell University. In March of 2010, he was offered a professorial position at the Hematology Center of Cyrus Tang Medical Institute Soochow University. His laboratory focuses on the understanding of the biology of autophagy in hematopoiesis and leukemogenesis, with an ultimate goal of preventing hematological oncogenic germination by protecting normal stem cells from malignant transformation.

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Jongkol Akahat et al., J Blood Disord Transfus 2017, 8:5 (Suppl)
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The development of LPPC in PAS in blood transfusion center: Faculty of Medicine Khon Kaen University, Thailand

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Background & Objective: Platelet additive solutions (PAS) are crystalloid nutrient media used in place of plasma for platelet storage. They replace 60-70% of plasma in platelet components. So the amount of storage plasma can be decreased. Platelet stored in PAS have been demonstrated to have a lower risk for allergic transfusion reactions and appeared to have equivalent clinical efficacy for controlling bleeding, compared to platelets stored in 100% plasma. We try to bring PAS to replace plasma in making leukocyte poor platelet concentrates (LPPC) compared with conventional methods that use plasma, 1 bag of total buffy coat 4 units.

Objective: The objective of this study was to prepare LPPC in PAS in our routine work, instead of the traditional LPPC.

Methods: PAS and plasma using a ratio of 65:35 in accordance with the standard reference. Then LPPC in PAS were measured for the volume, content of platelet concentrates, white blood cell contamination and the titer of anti-A and anti-B compared to traditional methods.

Results: LPPC in PAS had volumes 304±20 ml, content of platelet concentrates 2.8±0.5X1011 cells/unit and had 0.1X109 white blood cells contamination. LPPC from traditional methods had volumes 324±16 ml, contents of platelet concentrate 3.9±0.3X1011 cells/unit and had 0.1X109 white blood cells contamination. The titer of anti-A and anti-B in LPPC in PAS is less than or equal to 64, all of which are classified as low titer, but LPPC from the traditional way with a titer of anti-A and anti-B over 64 about 20 %.

Conclusion: All LPPC in PAS are classified as low titer, which led to the patient at any group. Content of platelet concentrates from LPPC in PAS provides reached the recommended quality of Council of Europe (EU) and National Blood Centre, Thai Red Cross Society (TRC).

Biography

Jongkol Akahat has completed her M.Sc. (Clinical Pathology) , B.Sc.(Med.Tech) from Mahidol and Khon Kaen university, respectively. She is a medical technician specialist in All blood transfusion science; HLA, genotyping, serology, etc. At present, her position is the head of blood components preparation in Blood Transfusion Centre, faculty of Medicine, Khon Kaen University, Thailand.

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Bethlehem Solomon et al., J Blood Disord Transfus 2017, 8:5 (Suppl)
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Global incidence and prevalence of acute lymphoblastic leukemia: A 10-year forecast

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Acute Lymphoblastic Leukemia (ALL) incidence is increasing globally and the case burden is expected to rise among adults in whom the disease is particularly fatal. The aim was to estimate changes in ALL risk and disease burden globally over the next decade. Using data from country-specific cancer registries, incidence was estimated for 45 countries, representing approximately 90% of the world population. Increasing age and male sex were the non-modifiable risk factors with the largest effects. To account for additional risk factors such as the increasing adoption of Western lifestyles characterized by dietary changes and more sedentary lifestyles, the proxy measure of forecast gross domestic product (GDP) were used. Prevalence was also estimated as a cumulative incidence over the preceding 12-month period with adjustments for disease-specific and competing-cause mortality. In 2020, we estimate ALL incidences to range from 0.4 to 2 per 100,000 in Asia-Pacific and South American countries, respectively; while prevalence will range from 0.37 to 1.6 per 100,000 in these regions. In terms of case burden, when accounting for the approximate 10% of the world's population not covered by the 45 countries in which we forecast incident and prevalent cases, there were a total of 53,000 cases in 2016 worldwide. Incorporating the aforementioned risk factors into a forecast model using demographic and GDP data published by the United Nations and World Bank, respectively, this number should increase to 56,000 cases by 2020. Most of these cases are in the Asia Pacific region, representing 55% of the worldwide total.

Biography

Bethlehem Solomon has completed her MPH, concentrating in both Epidemiology and Global Health from Boston University School of Public Health, USA. She is an Associate Epidemiologist with a focus on Oncology at Decision Resources Group, USA. She was a Visiting Scientist at the University of Cambridge/Wellcome Trust Sanger Institute, where she participated in the design and implementation of various studies focusing on non-communicable diseases, particularly in low and middle-income countries.

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Olutayo Ifedayo Ajayi et al., J Blood Disord Transfus 2017, 8:5 (Suppl)
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In vitro and *in vivo* evidences of sickling reversal induced by rehydration with high K+- isotonic solution

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Erythrocyte sickling and adhesion are favored by cellular dehydration, which increases the rate of hemoglobin polymerization and cell sickling. Potassium chloride co-transport and calcium-activated potassium channel (Gardos channel) mediate erythrocyte dehydration in sickle cell disease and β-thalassemia. We investigated the *in vitro* and *in vivo* effects of various concentrations of K+ ions in physiological solutions (PSS) as well as in *Cocos nucifera* water (CNw) which is known for its natural high potassium content and isotonicity. This study was aimed at ascertain the efficacy of high potassium isotonic solutions in rehydrating sickle cell and possibly reversing the sickling phenomenon at *in vivo* and *in vitro* situations. Erythrocytes from 20 sickle cell anemia (SCA) as well as 46 healthy subjects were studied. One part was treated with sodium metabisulfite (Na2S5O7) solution to induce maximum sickling as controls while the other was subjected to different high concentrations of K+ in PSS as well as *Cocos nucifera* water (40 mM, 80 mM and CNw – 65 mmol/L) respectively. The procedure was repeated for the normal HB AA subjects. Also, both groups of subjects were given 10 ml/kg body weight of coconut water to drink as a single dose for the *in vivo* experiment. Blood samples were collected longitudinally before and after the oral ingestion at 1 hour and at 24 hours for analysis of red cell indices as well as stained blood films used to ascertain the percentage sickled erythrocytes count before and after the treatment in both cases. Maximum percentage counts of sickled cells after the addition of Na2S5O7 (45%) were observed which decreased significantly ($P<0.05$, respectively) to about 2% with *Cocos nucifera* and 10% with 80 mM K+ PSS. The count in 40 mM K+-PSS was not statistically significant. In both Hb AA and SS subjects, MCH and MCV remained relatively stable when compared with the pre-ingestion sample ($P>0.05$, respectively) while MCHC increased significantly in both groups as early as 1 hour and sustained till the 24th hour. MCHC was equally raised in the *in vitro* samples ($P<0.05$, respectively). The morphology of red cells also indicated a lesser count of sickled red cells after the oral ingestion. *Cocos nucifera* water and other high potassium ion solutions can activate the rehydration of sickled erythrocytes by probably de-activating the Gardos channel to increase the mean corpuscular hemoglobin concentration (MCHC) and thereby restoring the normal red cell shape. We suggest a probable pharmacological value of the *Cocos nucifera* water as well as other formulated high potassium but isotonic fluids in SCA management.

Biography

Olutayo Ifedayo Ajayi holds a Diploma in Hematology and Blood Transfusion Science and a Fellowship Diploma in Clinical Chemistry from the Medical Laboratory Council of Nigeria. He later proceeded to University of Benin to study Human Physiology where he bagged his MSc and PhD degrees. He has many publications in both local and international journals. He is currently an Associate Professor and Head of Department of Physiology at University of Benin in Nigeria.

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Chinedu Kingsley Dike et al., J Blood Disord Transfus 2017, 8:5 (Suppl)
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Altered avidity to α and β antigenic reactions induced by malaria parasitaemia Nigerian subjects

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Plasmodium falciparum infected erythrocytes have been reported to display several dramatic morphological changes that affect membrane integrity such as rigidity, antigenic character and permeability. These modifications occur both at the erythrocyte cytoskeleton and extracellular surface of the membrane resulting in sub-cellular modifications of adhesive properties exhibited by the affected cells. It is plausible therefore to hypothesize possible alterations of blood group antigenic reactivity during the infection process that could cause danger in serological procedures. Our objective therefore was to ascertain the possible changes in the reactivity of α and β antigens to their corresponding antibodies in parasitized erythrocytes. A total of 200 blood samples comprising of 50 each from parasitemic subjects of blood groups A and B respectively. They were compared with 50 samples each from control subjects from corresponding blood groups respectively who tested negative for plasmodiasis. Confirmatory tests for malaria parasites were done by two algorithms of microscopy and rapid diagnostic tests. Standard tile and tube methods were used for direct and reverse blood grouping techniques with washed and unwashed red cells while time taken for agglutination reactions to take place was recorded as a score of avidity of the antibodies used on the red cell antigens. We recorded a significantly reduced reaction times in malaria parasitized red cells compared with non-parasitized controls in both blood groups A and B ($P<0.05$, respectively). Also, there were statistically reduced reaction times in unwashed cells compared with washed cells in both test and control erythrocytes ($P<0.05$, respectively). The reaction times using sera from subjects and controls on standard cells during reverse grouping were equally affected. We hereby conclude that, irrespective of density of parasitemia, reaction times of α and β antigens with their corresponding antibodies are reduced significantly. This could lead to errors in serological interpretations with malaria infected red cells especially during emergency cross match and with less avid sera. The continuous use of washed red cells for serological procedures is equally re-emphasized.

Biography

Chinedu Kingsley Dike holds a Bachelor's degree in Medical Laboratory Science with a bias in Clinical Chemistry. He is currently pursuing Post-graduate degree in Medical Laboratory Science. His main research interest is immunological studies of hemoparasites.

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Catastrophic antiphospholipid syndrome and sarcoidosis: A case report

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Catastrophic antiphospholipid syndrome (CAPS) is a systemic autoimmune disease which occurs in <1% of patients with Antiphospholipid syndrome (APS). It is the most severe variant of the classic APS, characterized by histopathologic and clinical evidence of widespread small vessel microthrombi. The resulting inflammatory cytokine storm causes multi-organ failure over a short period and laboratory confirmation of high antiphospholipid antibody titers. Sarcoidosis is a systemic inflammatory disorder characterized by granulomatous inflammation of various organs. Although the association of APS and sarcoidosis may be explained by shared immune dysregulation, cases with concurrent sarcoidosis and APS are extremely rare. Here, we present the 12th reported case, presenting with digital gangrene and review the literature on CAPS. A 66 year-old gentleman presented with rapidly progressive ischemic changes of extremities with skin ulcerations and gangrene of peripheral digits. Autoantibodies testing revealed elevated levels of anti-beta2 glycoprotein IgM and anti-cardiolipin IgM antibodies. Skin ulceration biopsy showed vasculitis with intravascular microthrombi deposition. First-line treatment was initiated for "Probable CAPS" with anticoagulation, glucocorticoids and therapeutic plasma exchange. Subsequent, bone marrow biopsy workup for acute leucopenia with lymphopenia, revealed non-necrotizing granuloma, suggestive of sarcoidosis. This was further substantiated with high serum Angiotensin converting enzyme level. CAPS is a challenging systemic disease requiring a high index of clinical awareness, as outcomes are poor without prompt recognition and early initiation of targeted multimodal therapy. This case highlights the need for a collaborative team approach. It is also the first case reported of probable CAPS associated with sarcoidosis of bone marrow.

Biography

Nova Thomas John has completed her MBBS degree from Kasturba Medical College, Manipal University, Karnataka, India and Internal Medicine Residency from University of Illinois Urbana-Champaign, Illinois, USA. She is currently practicing as a Hospitalist Medicine Physician with Starling Physicians Group at Hartford Hospital, Connecticut, USA since August 2015.

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James Granfortuna, J Blood Disord Transfus 2017, 8:5 (Suppl)
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Integrating new treatment options into the management of adult ITP

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Treatment of Steroid resistant ITP in adults can be challenging in patients who are actively bleeding. The majority of novel therapies that have been developed in the last few years including anti CD 20 monoclonal antibody therapy (Rituximab) and thrombopoietic growth factors, romiplostim and eltombopag, take time to work. Combinations of active agents may accelerate the response rate. Splenectomy and the use of immunosuppressive agents may still have an important role in the acute management. A case of resistant ITP will be discussed in the context of currently available treatment modalities.

Biography

James Granfortuna MD FACP graduated from Mount Sinai School of Medicine in 1980 and completed a Hematology Oncology Fellowship at the State University of NY Health Sciences Center in Syracuse NY in 1987. He is board certified in both specialties. He is currently an Associate Professor of Clinical Medicine at the Cone Health Internal Medicine Teaching Program in Greensboro, NC.

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Erhabor Osaro et al., J Blood Disord Transfus 2017, 8:5 (Suppl)
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Hematological profile and ascorbate deficiency among children of African descent with protein energy malnutrition in Sokoto, North Western Nigeria

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Protein energy malnutrition is the most widespread nutritional deficiency disorder of mankind and continues to be a major public health burden in developing countries. The aim of this case-control study was to determine the changes in some hematological parameters, ascorbic acid and pantothenic acid levels among children with Protein Energy Malnutrition (PEM) in Sokoto, North Western Nigeria. The study included a total of 90 children (47 subjects with PEM and 43 apparently healthy controls) aged 6 months to 5 years, admitted to the Pediatric Unit of Usmanu Danfodiyo University Teaching Hospital and Specialist Hospital, Sokoto. Some hematological parameters (packed cell volume, total white blood cell count and platelet count) were analyzed using the auto-hematology analyzer (Genesis, HA6000). Ascorbic acid levels were assayed by a standard chemical method. Nutritional status was determined using the Welcome Trust Classification. Data were analyzed using SPSS 22.0 statistical package. A p-value ≤0.05 was considered significant in all statistical comparisons. The result indicated that subjects with protein energy malnutrition had a lower mean packed cell volume (25.50±6.83%) compared to controls (32.73±6.85 %) (p=0.0001). The mean total white cell count was significantly higher among subjects with protein energy malnutrition (12.16±4.94×109/l) compared to controls (7.59±3.20×109/l) (p=0.0001). There were no statistically significant differences in the mean value of platelet counts of subjects (260.40±148.8×109/l) and controls (1237.61±99.20×109/l) (p=0.400). The mean value of ascorbic acid was significantly lower among subjects (0.82±0.27 mg/dl) compared to controls (1.06±0.15 mg/dl) (p=0.0001). Children with Kwashiorkor had higher value of packed cell volume compared to those with marasmic-kwashiorkor (p=0.0001). Children with marasmic-kwashiorkor had a higher total white cell count when compared with other types of protein energy malnutrition (p= 0.0001). Underweight subjects had lower ascorbic acid levels when compared with other types of protein energy malnutrition (p=0.0001). Platelet count and pantothenic acid levels showed no significant difference within the various types of protein energy malnutrition (p=0.331 and 0.391, respectively). This study has shown that children with protein energy malnutrition have lower packed cell volume and ascorbic acid levels compared to controls. The total white cell count was higher among children with protein energy malnutrition compared to controls. Protein energy malnutrition was more prevalent among children from low socioeconomic class whose mothers have no formal education. Marasmus was the most common type of protein energy malnutrition. Children with kwashiorkor have a higher packed cell volume compared to other types of protein energy malnutrition. Total white blood cell count of children with marasmic-kwashiorkor was significantly higher compared with other types. Immune boosters (vitamins and other micronutrient) should be provided for school children particularly children with protein energy malnutrition. There is need for infant feeding practice to be strengthened by promoting exclusive breast feeding. There is need for increased enrollment of women in schools, enlightenment on nutritional education and empowerment so as to improve their socioeconomic status.

Biography

Erhabor Osaro is a Professor of Hematology, Blood Transfusion Medicine and Laboratory Total Quality Management. He has received his PhD in Immuno-Hematology from the Rivers State University of Science and Technology in Port Harcourt, Nigeria. He is also an Alumni of University of Greenwich in the United Kingdom and Francis Tuttle College of Technology in Oklahoma, USA. Currently, he is a Professor in Usmanu Danfodiyo University, Sokoto, Nigeria, where he teaches best practices in hematology, blood transfusion science and laboratory total quality management. He has more than 200 published articles in both local and international journals, 5 scientific books and 5 chapters of scientific books. He is on the Editorial Board of several reputable local and international journals and Editor-in-Chief of the renowned *Sokoto Journal of Medical Laboratory Science*. He is an expert reviewer to several international scientific journals. He has recently bagged the Specialist Certificate in Blood Transfusion Science Practice (SCTSP) from the British Blood Transfusion Society in the United Kingdom. He is a recipient of several awards and honors including the Margaret Kenwright Award from the British Blood Transfusion Society (BBTS). He is the President of Board of Directors of Nelon Medical Limited, UK.

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Rosemary Omomo Ekpeh et al., J Blood Disord Transfus 2017, 8:5 (Suppl)
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Altered leucocyte functions in HIV infected subjects

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Polymorphonuclear neutrophils play an important role in host defense and they have the ability to recognize and phagocytose bacteria and other microorganisms. Previous studies have shown that, leucocyte functions are impaired in human immunodeficiency virus infection. This study was undertaken to investigate changes of phagocytic function and oxidative burst activity occurring in HIV infected subjects. A total of 191 patients were recruited for this study, comprising 58 HIV negative individuals (control), 72 HIV infected subjects that are not on antiretroviral therapy and 61 HIV infected subjects on antiretroviral therapy. Trypan blue was used to determine viability test, Nitroblue Tetrazolium test was used to measure the oxidative burst and phagocytosis was assessed by incubating leucocyte suspension with *Escherichia coli* and measuring the ability of leucocytes to ingest bacteria. The CD4 cell count and CD8 cell count was analyzed using BD FACSCount auto analyzer. Our results showed significantly decreased phagocytic function and oxidative burst activity ($p<0.05$, respectively) in the HIV group both on ART and not on ART (untreated group) as compared with the controls group. Similarly, a significant ($p<0.05$, respectively) decrease in leucocytes viability was observed in both HIV groups compared with controls. Furthermore, leucocyte viability of HIV infected subjects who were not on ART were significantly reduced ($P<0.05$) when compared with HIV infected subjects on ART. This finding may suggest that leucocytes from HIV infected individuals have impaired ability to phagocytose and undergo oxidative burst activity, however may contribute to the increased risk of bacterial infections in HIV-infected subjects. It was observed that oxidative activity and phagocytic function was inversely correlated to the change in CD4 count value, that is, the greater the CD4 value the better the oxidative activity and phagocytic function. It is recommended that further studies on mechanisms of failure of phagocytosis and oxidative burst potentials of HIV infected subjects.

Biography

Rosemary Omomo Ekpeh is a graduate of Medical Laboratory Science with a bias in Hematology and Blood Transfusion Science. She is currently pursuing MSc in Hematology at the University of Benin, Nigeria. She works as a Medical Scientist with the APIN/PEPFAR Laboratory of Edo State Health Management Board.

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Augustine Okwesili, J Blood Disord Transfus 2017, 8:5 (Suppl)
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Direct antiglobulin reactions in *Plasmodium falciparum* parasitized patients in Sokoto, North-Western, Nigeria

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Background & Aim: Malaria is a global public health problem affecting people particularly in tropical and sub-tropic regions of the world. Immune mediated hemolysis is thought to occur in malaria infection. The aim of this study was to investigate the incidence of direct antiglobulin positivity among 100 patients with *P. falciparum* malaria in Sokoto, North Western, Nigeria.

Method: Evidence of immune mediated hemolysis with characteristic positive direct Coombs test was investigated among a cohort of 100 *Plasmodium falciparum* parasitized subjects aged 6 to 45 years and mean age 26.9±8.25 years, made of 56 males (56%) and 44 females (44%) resident in Sokoto, North Western, Nigeria.

Result: Amongst the 100 subjects with uncomplicated malaria infection, 3 (3%) had a positive Direct Antiglobulin Test (DAT). The incidence of positive DAT was concentrated among subjects in the 6-15 years age groups (p=0.001). There are no gender-related differences in the incidence of positive DAT among the subjects.

Conclusion: These findings indicate that a positive DAT is common in *Plasmodium falciparum* parasitized Nigerians. Malaria-related positive DAT may be responsible for the anemia seen in patients with malaria. There is the need for the routine monitoring of malaria parasitized subjects, particularly those with anemia in the area.

Biography

Augustine Okwesili has completed his MSc from the Usmanu Danfodiyo University Sokoto, Nigeria. He is a Lecturer in the Department of Hematology in the same university and has published more than 27 papers in different journals of medicine both internationally and locally.

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Scientific Sessions & Abstracts

Day 2

Sikander Ailawadhi et al., J Blood Disord Transfus 2017, 8:5 (Suppl)
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Psychiatric comorbidities are associated with significantly increased cost of care and healthcare utilization in multiple myeloma (mm) patients

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Background: Cost of cancer care is projected to reach $173 billion by 2020, a 39% increase from 2010. Several factors including psychiatric (psych) comorbidities contribute to this increase. Within the oncology setting, 29-38% of the patients (pts) are reported to have mood disorders and 15% have major depression. Depression alone is associated with increased healthcare utilization in pts with breast, colon, lung and prostate cancers. A 2015 report noted that the presence of at least one psychiatric comorbidity in 300 Leukemia pts was associated with an extra $55,000 per pt in just one year. Similarly, in pts treated with systemic steroids, the incidence of neuropsychiatric disorders can be as high as 75%. However, no such data is available for MM, where more than 90% of pts are treated with steroids, likely increasing risk for mood problems and impacting treatment cost. As such, the aim of our study was to analyze the SEER-Medicare database for healthcare utilization trends and acute cost of care (cost incurred during 6 months after MM diagnosis) in MM pts with or without psych comorbidities.

Methods: Pts diagnosed with MM between 1991-2010 with continuous Medicare coverage (1 year prior to diagnosis-date of death/ end of 2012) were included. Pts were categorized as: MM with any psych disorder (MM+P), MM with depression (MM+D) and MM only. Presence of ≥1 inpatient (ipt) or ≥2 outpatient (opt) ICD9 diagnosis codes were used to assign pts to the psych categories. Within MM+P and MM+D groups were subdivided by presence of psych or depression diagnosis prior to MM (MM+P PRE or MM+D PRE). Medicare claims adjusted for inflation (2013) within the first 6 months (mth)/total MM care were summed by drug and total charges. Univariate and multivariate logistic regression models (adjusted for age, year, sex, race and the Charlson Comorbidity Index; CCI) were performed to determine associations with ipt, opt and any emergency department (ED) charges after MM diagnosis. Associations between psych conditions prior to MM diagnosis and costs of care after MM diagnosis were assessed using univariate and multivariate proportional odds models.

Results: The study population included 36,007 eligible MM pts with a median follow-up of 1.8 years. 15168 (42%) pts had a psych condition at any time (MM+P), while 9355 (26%) were diagnosed prior to MM diagnosis (MM+P PRE). Depression was present in 8421 pts (23%), 4546 (13%) of those occurring prior to MM diagnosis. In comparison to MM pts, MM+P and MM+D pts tend to be female, White and had a higher CCI (all $p<0.001$). When compared to MM pts, those with MM+P PRE and MM+D PRE had significantly higher incidence of MM-related complications (hypercalcemia, renal dysfunction, anemia, fractures and dialysis) at the time of or after MM diagnosis and also required increased overall care (all $p<0.001$). Both, MM+P and MM+D had higher odds of ipt visits (OR 1.48 and 1.41, resp., $p<0.001$), ED care (OR 1.48 and 1.37, resp., $p<0.001$) and opt visits (OR 1.25 and 1.22, resp., $p<0.001$) as compared to MM only pts. Cost of care analysis showed that MM+P and MM+D pts had a significantly higher cost of opt (OR 1.36 and 1.39, resp., $p<0.001$), ipt (OR 1.49 and 1.54, resp., $p<0.001$) and total care (OR 1.52 and 1.55, resp., $p<0.001$) as compared to MM only pts during first 6 mth after MM diagnosis (Figure 1). Total costs of care for MM+P and MM+D were also higher than MM only but the differences were less significant. Cost of care differences existed within first 6 mth of MM diagnosis by pt race as well with MM+P among Hispanic and Asian pts being more strongly associated with higher costs than Whites and African-Americans (AA) ($p<0.001$). MM+D had similar trends but not significant after adjustment for multiple comparisons.

Conclusion: Psych comorbidities are associated with significant increase in healthcare utilization and cost of care in MM pts and may contribute to higher MM-related complications. More research is needed to study whether a multidisciplinary approach to identify and manage MM pts with psych conditions may help mitigate these trends.

Biography

Sikander Ailawadhi has expertise in the field of plasma cell disorders, specifically multiple myeloma and focuses on clinical drug development as well as a special interest in secondary data analysis looking at outcome disparities and healthcare economics. He has accumulated vast experience in the area of disparities in healthcare utilization and outcomes by patient race and ethnicity and how the management, access and effects of therapeutic interventions may be different for various patient subgroups. Several of his research projects focusing on healthcare economics, cost-effectiveness and outcome disparities have been recognized in the form of presentations at national and international meetings as well as peer-reviewed publications.

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Lupus nephritis masquerading as hemophagocytic lymphohistiocytosis

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Hemophagocytic Lymphohistiocytosis (HLH) is a rare, life threatening clinical syndrome characterized by hyperinflammatory cytokine storm due to exaggerated immune response. It may be triggered secondary to infections, malignancies, autoimmune diseases or medications. The following case report demonstrates acute lupus nephritis with initial presentation as HLH called acute lupus hemophagocytic syndrome. Estimated prevalence of HLH secondary to Systemic Lupus Erythematosus (SLE) is rare between 0.9-4.6%. A 20-year-old African American female presented with progressive myalgia, malaise and recurrent fevers for 3 weeks. Vitals signs were normal except for temperature of 102oF. Her examination was unremarkable except for right posterior cervical lymphadenopathy. Laboratory data showed pancytopenia, hypertriglyceridemia, hyperferritenemia >17,000, hypoalbuminemia. Urine 24-hour protein was elevated >5000 mg/24 hr. Bone marrow biopsy confirmed HLH and Renal biopsy confirmed Lupus nephritis. With the initiation of immunosuppressive regimen of dexamethasone and mycophenolate mofetil, she improved dramatically with resolution of fevers and normalization of HLH-specific disease markers. This case highlights the diagnostic challenge that may lead to delay in diagnosis of acute lupus hemophagocytic syndrome. Patients presenting with unexplained prolonged fever, cytopenia, abnormal liver function and elevated ferritin levels, should prompt clinicians to perform immunologic testing for SLE in setting of HLH to avoid diagnostic and therapeutic delays.

Biography

Nova Thomas John has completed her MBBS degree from Kasturba Medical College, Manipal University, Karnataka, India and Internal Medicine residency from University of Illinois Urbana-Champaign, Illinois, USA. She is currently practicing as a Hospitalist Medicine Physician with Starling Physicians Group, P C at Hartford Hospital, Connecticut, USA, since August 2015.

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The many faces of thrombotic microangiopathies

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The thrombotic microangiopathies (TMAs), are a complex group of disorders that typically present with a schistocytes hemolytic anemia and associated thrombocytopenia with ensuing microvascular occlusion leading to tissue ischemia and end organ damage. CNS, GI and cardiac microcirculations are frequent targets. Signs and symptoms related to organ dysfunction may evolve over weeks to months and may not be present simultaneously. LDH elevation due to microvascular ischemia is frequently disproportionate to elevation of bilirubin or reticulocyte count. The major thrombotic microangiopathies include TTP, DIC/sepsis and Hemolytic Uremic Syndrome. HUS may be further divided into "typical", related to Shiga toxin, "atypical", related to dysregulation or over-activation of complement and secondary, including disorders of pregnancy such as the HELLP syndrome or pre-eclampsia, certain other infections such as Strep Pneumoniae, auto-immune disorders such as Sjogren's syndrome, cancer, chemotherapy, or other medications, such as quinine and calcineurin inhibitors. These disorders can provoke direct microvascular damage and present as a thrombotic microangiopathy or act as a trigger for a microangiopathic syndrome in individuals with a genetic predisposition. The level of ADAM-TS 13, Von Willebrand Factor cleaving enzyme, is a key discriminator between TTP and HUS being severely reduced in TTP but not HUS. Plasma exchange with or without steroids is the mainstay of treatment for TTP. Anti C5 antibody therapy has evolved as an important treatment for a HUS. Although we have gained significant insight into the pathophysiology of many of these disorders, given the complex interplay between genetic factors, acquired factors, the roles of the humoral, cellular and innate immune systems, the inflammatory response and the coagulation system, TMAs remain clinically challenging. This review will focus on a summary of our current knowledge with regard to diagnosis and treatment of TTP and HUS and how they relate to each other and the broader family of TMAs. Three clinical cases will be used to illustrate key points.

Biography

James Granfortuna is a practicing Hematologist-Oncologist for 30 years. He is currently a full time Faculty Member at the Cone Health Internal Medicine Teaching program, affiliate hospital of the University of North Carolina Chapel Hill Medical Center. His special interests include platelet and clotting disorders in the general population and in pregnancy.

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Chimeric antigen receptors (CARs) engineered control adverse immune responses

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Building on Chimeric Antigen Receptor (CAR) therapy for cancer, we have created and expanded human "natural" regulatory T cells (Tregs), as well as cytotoxic T cells that are rendered specific by expression of either T-cell receptor (TCR), single chain Fv (scFv) V regions or a novel CAR derivative, called B-cell antibody receptors (BAR). These specific Tregs demonstrate potent suppression of T-cell and B-cell responses in two disease models, MS and hemophilia, *in vitro* and *in vivo*. These cells are stable, specific and potent. Engineered BAR cytotoxic cells have also been generated that can directly target and kill specific B cells. Our results are a platform to generate T cells that can be used to block adverse immune responses. Translation into large animals and clinical trials are planned.

Biography

David W Scott, PhD is Vice Chair for Research, Department of Medicine, Uniformed Services School of Health Sciences, Bethesda, MD and an alumnus of Antioch College, University of Chicago (MS) and Yale (PhD). Following a fellowship at Oxford University, he held tenured positions at Duke University, University of Rochester and University of Maryland Medical School. He has contributed to over 200 research papers on immunologic tolerance and its application in autoimmune diseases, hemophilia and gene therapy. He is the author of two textbooks, including *The Nature of Immunologic Tolerance*, he is a recipient of a number of awards, e.g. Distinguished Service Award from the American Association of Immunologists, a Boarhaave Professorship at Leiden University in Holland and the 2009 Scientific Achievement Award from AAPS.

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Black lung disease is mostly caused by silica toxicity and silica toxicity is caused by contamination with calcium

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Toxic dusts like coal and silica, present a confusing picture regarding toxicity when inhaled into the lung. Why should such dusts be inherently inflammatory and/or toxic both in the short and particularly in the long term? Since these dusts create at first acute and then chronic diseases- are there important ways to treat these diseases once they have begun their inevitable course. Mine dusts are a complex mixture of different compositions of dust but almost all coal dust contains both the dust from coal (carbon) and rock dust (silica). We have found that the silica has a major contaminant since X-ray microanalysis indicates two clear peaks –one for SiO2(-2) and one for Ca+2. We dripped a slurry of silica powder into lungs of rats under anesthesia. Twenty-four hours post silica exposure- luminescence- from the lavage cells were assayed using L-012 and the peroxynitrite-based light was 10-fold higher which could be completely inhibited by dexamethasone. In the treated silica animal, the nitric oxide production increased 10-fold without dexamethasone-steroid. After 6 weeks, the luminescence was increased 1000-fold. But, then the steroid had no effect because induction of nitric oxide synthase had already occurred. Steroids are not effective for chronic diseases, since the epigenetic deacetylation mechanism used by steroids is damaged by excessive peroxynitrite. This same scenario occurs in humans if a person has inhaled silica, the acute disease can be controlled using chronic steroids but if they are withdrawn, the patient will die. The development into the chronic state must be stopped to preserve life.

Biography

Knox Van Dyke is a Professor of Biochemistry and Molecular Pharmacology at West Virginia University Medical School with 50 years of research experience. He completed his PhD in Biochemistry in the Edward A Doisy–Nobel Prize Department at Saint Louis University in 1966. He did Post-doctoral studies in the Department of Pharmacology at West Virginia University Medical School. During this time, he developed the first effective drug screening system for antimalarial drugs while screening over 10,000 drugs. Mefloquine and halofantrine were recognized by this screening system and were further developed by Walter Reed and various companies as patented drugs. He first solved the problem of black lung disease and silicosis by demonstrating that coal dust per se is not particularly toxic to human cells compared to silica and that silica is not particularly toxic alone but it is contaminated with calcium. He recognized that urate in the blood protects against peroxynitrite generating chronic diseases. He has recognized that many chronic diseases like cancer, arthritis, diabetes and heart diseases etc., are caused by excessive peroxynitrite or its derivatives. He has over 300 publications and 150 patents.

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Systemic mastocytosis (SM): Analysis of diagnostic markers and course of the disease prediction

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We analysed data of 40 patients with SM, focusing on markers that could be sensitive to support the diagnosis of SM and that might distinguish indolent and aggressive course of the disease. We looked at C-KIT mutation detection in both bone marrow and peripheral blood and we ańalyzed the tryptase level. Median age of patients at the time of diagnosis was 53 (25-84) years, 45% of patiens were males. Indolent SM (ISM) was diagnosed in majority of patiens: 29 (72%), aggressive SM (ASM) in 9 (23%) patients and in 2 patients was established SM-AHN (ET and AML). All patiens were treated with long term antiallergic profylaxis with both H1 and H2 blockers, 19 patients started specific first line treatment for SM with interferon- alfa (13) or cladribin (5). Three patiens died, 2 for ASM progression, 1 for SM-AHN (AML). Presence of C-KIT D816V mutation by PCR was analysed in 31 patients in bone marrow (BM) and/or peripheral blood (PB). In 27 patients, the mutation was examined in bone marrow, 22 (81%) of them were positive. In 12 patients, the c-kit mutation was examined in peripheral blood, only 4 of them were positive (33%). The c-kit mutation was analysed in 8 patients in both BM and PB, 5 of them (63%) were positive in BM and negative in PB at the same time. We analysed difference of tryptase level in ISM and compared it to the ASM. Median tryptase level in ISM was 37, 1 (6, 03-200) μg/l, in ASM 200 (58-200) μg/l respectively.

Biography

Tomas Kozak has completed his MD from Charles University in Prague and later Post-doctoral studies from Masaryk University in Brno. He is Professor at the Department of Internal Medicine and Haematology at the 3rd Faculty of Medicine, Charles University in Prague, Czech Republic. He has published more than 90 papers in reputed journals as Author, Co-author or Senior Author and has been serving as an Editorial Board Member of repute.

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Nabusige Jean Brenda Gesa, J Blood Disord Transfus 2017, 8:5 (Suppl)
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Screening and identification of an aptamer to the HL-60 cell line of acute promyelocytic leukemia from a specific human ssDNA library

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APL is the most curable form of AML due to its sensitivity to ATRA, but challenges due to the threat of DIC at diagnosis and drug toxicity of combination therapies during treatment, still remain. The aim of this study was to generate information on a newly selected group of ssDNA aptamer candidates and build a potential aptamer library, for future use and reference in improving diagnostic and therapeutic efficacy in APL management. This study involved the amplification of 7 highly specific ssDNA sequences of 39-40bp each flanked by an 18bp primer sequence on both 5' and 3' ends. DNA was cloned into DH5α cells and ssDNA obtained by affinity chromatography, purified and quantified by spectrophotometry. Cell binding affinity assays were conducted with APL HL-60 cells at room temperature, with incubation at 37 ^{0}c. Results were quantified by spectrophotometry. Quality and yield of PCR amplified DNA was dependent on concentration of plasmid template in the PCR mix and the number of cycles employed. It was realized that DNA purification using Phenol-chloroform was most effective when plasmid templates used were freshly extracted and hadn't been subjected to prolonged storage. Of the 7 DNA sequences tested, sequences 135, 57 and 2 were observed to have the highest affinities and 59, the lowest. Sequences 135 and 2, on statistical analysis demonstrated the highest affinities and are deemed ideal candidates for further investigation in the development of effective aptamers and other tools for timely diagnosis and effective management of APL. We suggested that further research be done.

Biography

Nabusige Jean Brenda Gesa is a dedicated scholar of Hematology and Oncology, passionate about healthcare advancement in Uganda and proficient in at least 3 languages, including English and Mandarin Chinese. She received her Bachelors' degree in Biomedical Laboratory Technology from Makerere University, Kampala and a Master of Medicine in Clinical Laboratory Diagnostics at Beihua University, China (2017). She also acquired diagnostic laboratory experience at St. Raphael of St. Francis Hospital, Nsambya in Kampala and Jilin Central Hospital, China. Her research interests include environmental pollutants in relation to hematological malignancies and hematological cancer research; diagnostics and therapeutics.

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Erhabor Osaro et al., J Blood Disord Transfus 2017, 8:5 (Suppl)
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L-arginine levels among hypertensive patient of African descent in Sokoto, North Western Nigeria

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Hypertension is a major public health problem that adversely affects the health status of individuals, families and communities. L-arginine levels of a total of 90 consecutively- recruited hypertensive subjects and 50 age-matched non-hypertensive controls were studied. Plasma from subjects and control participants were analyzed for L-arginine. The mean values of L-arginine level were significantly lower among the hypertensive subjects 174.33±78.31 µmol/L, compared to those of the 50 non-hypertensive controls 237.82±261.16 µmol/L (p=0.04). There was no statistically significant difference in the L-arginine levels of hypertensive subjects based on gender, age and ethnicity (p=0.87, 0.23 and 0.57), respectively. The L-arginine level was significantly higher among married hypertensive subjects (181.71±78.17 µmol/L) compared to single or unmarried subjects 130.62±65.99 µmol/L (p=0.03). The mean value of L-arginine level was significantly higher among hypertensive subjects with mild blood pressure 187.63±77.93 µmol/L, compared to those with high blood pressure 156.93±76.31 µmol/L. The difference however was not statistically significant (p=0.05). The findings from this study confirm that the level of L-arginine is lower among hypertensive subjects compared to non-hypertensive controls. Age, gender and ethnicity did not have a significant effect on the L-arginine levels of hypertensive subjects. L-arginine level was significantly lower among single hypertensive patient and those with markedly raised blood pressure. It is recommended that L-arginine supplement be prescribed to hypertensive patient as a prophylactic measure. There is need to enlighten hypertensive patients in the area on the need to maintain a balanced diet containing sufficient level of L-arginine.

Biography

Erhabor Osaro is a Professor of Hematology, Blood Transfusion Medicine and Laboratory Total Quality Management. He has received his PhD in Immuno-Hematology from the Rivers State University of Science and Technology in Port Harcourt, Nigeria. He is also an Alumni of University of Greenwich in the United Kingdom and Francis Tuttle College of Technology in Oklahoma, USA. Currently, he is a Professor in Usmanu Danfodiyo University, Sokoto, Nigeria, where he teaches best practices in hematology, blood transfusion science and laboratory total quality management. He has more than 200 published articles in both local and international journals, 5 scientific books and 5 chapters of scientific books. He is on the Editorial Board of several reputable local and international journals and Editor-in-Chief of the renowned *Sokoto Journal of Medical Laboratory Science*. He is an expert reviewer to several international scientific journals. He has recently bagged the Specialist Certificate in Blood Transfusion Science Practice (SCTSP) from the British Blood Transfusion Society in the United Kingdom. He is a recipient of several awards and honors including the Margaret Kenwright Award from the British Blood Transfusion Society (BBTS). He is the President of Board of Directors of Nelon Medical Limited, UK.

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Antiphospholipid antibody syndrome and obstetric anesthesia

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Antiphospholipid antibody syndrome (APS) or Hugues' syndrome is an autoimmune thrombotic disorder characterised by hypercoagulability, leading to venous and or arterial thromboembolism. It usually presents in women of reproductive age with recurrent abortions or infertility. It can produce thromboembolic events in any organ system and cause utero-placental insufficiency in a pregnant women. There are several anesthetic challenges in an obstetric patient with APS, more so for operative delivery in an emergency setting. We hereby present a case of successful management of emergency section in a patient with known APS, with no maternal or fetal complications.

Biography

Uma Hariharan is a MBBS graduate from the prestigious Armed Forces Medical College, Pune, where she won several accolades: Best symposium presentation award; College Blues award for all-round performance; Indian academy of Pediatrics Quiz award; Ladies house captain; and First in Preventive & Social Medicine. She attained her Post-graduate degree in Anesthesiology from the prestigious Sir Ganga Ram Hospital & GRIPMER, New Delhi, India. She won the best DNB student (Diplimate of National Board) award in 2006. She won both the best paper and best poster presentation in national conferences during residency. Now, she is a teaching faculty in Anesthesiology at Dr. RML Hospital & PGIMER, New Delhi. She has more than 70 article publications and several book chapters to her credit. She is in the reviewer board of all national anesthesiology journals. She is also an editor of great repute in several international journals of anesthesia, medicine and cancer. She has done fellowship in Oncoanesthesia from Rajiv Gandhi Cancer Institute and Research Centre, Rohini, Delhi. In addition, she has a Post-graduate diploma in Hospital administration (PGDHM), New Delhi. She also obtained profienciency in ultrasound-guided nerve blocks through a fellowship in advanced regional anesthesia from Ganga hospital, Coimbatore. She also has won several prizes in classical music and dance competitions.

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