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VIRTUAL EVENT

2nd International Congress on

ADVANCED CARDIOLOGY & CARDIOVASCULAR RESEARCH

MARCH 21, 2023

ADV CARDIOLOGY 2023

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ADV. CARDIOLOGY
2023

DAY 2
MARCH 21, 2023

Scientific Program

GMT- Greenwich Mean Time

08:30-08:40	**Opening Ceremony**

Sessions: Cardiologist | Clinical Cardiology | Heart Diseases | Hypertension | Interventional Cardiology | Nuclear Cardiology | Cardiac Nursing | Pediatric Cardiology | Stroke | Cardiac Surgery | Cardiovascular Diseases

Distinguished Speaker Talks

08:40-09:00	**Title: Factors associated with early biological aging in older people with HIV** **Isaura Romero** *Peixoto, Federal University of Pernambuco, Brazil*
09:00-09:20	**Title: Bedside ultrasound RUSH process improves the quality of anesthesia for elder emergency surgery patients** **Dawei Liu,** *Yongchuan Hospital of Chongqing Medical University, China*
09:20-09:40	**Title: miR-221/222-3p act as potential circulating factors in heart failure promoting cancer progress** **Zhenjun Ji,** *Zhongda Hospital, Southeast University, China*
09:40-10:00	**Title: Baicalin Alleviates LPS-Induced oxidative stress via NF-kB and Nrf2–HO1 signaling pathways in IPEC-J2 cells** **Xiaoxi Liu,** *Guangdong Ocean University, China*
10:00-10:20	**Title: Real-time infection monitoring via wearables** **Daniel Berckmans,** *KU Leuven, Belgium*
10:20-10:40	**Title: The clinical management of Pompe Disease: A pediatric perspective** **Jorge Sales Marques,** *Hospital Cuf Trindad, Portugal*

Refreshment Break 10:40-11:10

11:10-11:30	**Title: Postoperative Results of the In Situ Fenestrated Open Stent Technique (FeneOS) for Acute Aortic Dissection Type A** **Shuhei Azuma,** *Kyoto Katsura Hospital, Japan*

11:30-11:50	**Title: The American Heart Association classification of blood pressure and the determinants of hypertension among medical practitioners in Bayelsa State: A cross-sectional study** **Tamaraemumoemi Emmanuella Okoro,** *Niger Delta University Teaching Hospital, Nigeria*
11:50-12:10	**Title: Hypoxia aggravates inhibition of Alveolar Epithelial Na-Transport by Lipopolysaccharide-Stimulation of Alveolar Macrophages** **Emel Baloglu,** *Acibadem Mehmet Ali Aydinlar University, Turkey*
12:10-12:30	**Title: Dynamics of deformational properties of the left ventricle in patients with coronary artery disease complicated by heart failure with preserved ejection fraction** **Feruza Bekmetova,** *Republican Specialized Scientific and Practical Medical Center of Cardiology, Uzbekistan*
12:30-12:50	**Title: Kinetics of Granuloma, IFN-γ and IP-10 in a wistar rat model infected with *Mycobacterium Tuberculosis*** **Bobby Singh,** *Sebelas Maret University, Indonesia*
12:50-13:05	**Title: ST segment resolution after thrombolysis in acute myocardial infarction as a predictor of outcome.** **Gundapaneni Sri Ram Charan,** *Rangaraya Medical College, India*
Lunch Break 13:05-13:40
13:40-13:55	**Title: CMV Myocarditis** **Sai Tharun R,** *RVM Institute of Medical Sciences, India*
13:55-14:15	**Title: Artificial intelligence applied to nutritional therapy in Moroccan type 2 diabetics: Methodological approach** **Saliha CHELLAK,** *Cadi Ayyad University of Marrakech, Morocco*
14:15-14:35	**Title: R to Q substitution at 98, 141 and 162 in TNNI3 associated with HCM among Indians** **Deepa Selvi Rani,** *CSIR-Centre for Cellular and Molecular Biology, India*
14:35-14:55	**Title: Impact of using the modified Devaga Annuloplasty (mDA) using pericardial patch versus Ring Annuloplasty (RA) in Mitral valve replacement with severe functional tricuspid regurgitation(TR): A novel revolutionary technique or just another addition to the surgical conundrum** **Deepi Agrawal,** *Seth GS Medical College and KEM Hospital, India*

14:55-15:15	**Title: The role of Artificial intelligence in the classification of structural brain anomalies** **Kirti Raj Bhatele,** *Border Security Force Academy, India*
15:15-15:35	**Title: The PediaFlowTM Pediatric Ventricular Assist Device** **Harvey S. Borovetz,** *University of Pittsburgh, USA*
15:35-15:55	**Title: First-in-human experience of preload regulation with percutaneous transluminal caval flow regulation in heart failure with reduced ejection fraction patients** **Jose E. Herrera,** *ASCARDIO, Venezuela*

Refreshment Break 15:55-16:30

16:30-16:50	**Title: Thromboprophylaxis of patients submitted to total hip and knee arthroplasty: A cost-effectiveness assessment from the perspective of the Brazilian National Health System** **Artur Felipe Siqueira de Brito,** *Federal University of Bahia (UFBA), Brazil*
16:50-17:10	**Title: On the fractal geometry of different heart rhythms** **Tahmineh Azizi,** *University of Wisconsin-Madison, USA*
17:10-17:30	**Title: Fetal left ventricular aneurysm progressing to dilated cardiomyopathy** **Rukmini Komarlu,** *Cleveland Childrens Hospital, USA*
17:30-17:50	**Title: Role of inhalational Aztreonam lysine in lower airway infections in cystic fibrosis: An updated literature review** **Mehwish Zeb,** *California Institute of Behavioral Neurosciences and Psychology, USA*
17:50-18:10	**Title: Simvastatin monotherapy vs Simvastatin-Ezetimibe combination therapy: A meta analysis of existing literature** **Vikramaditya Samala Venkata,** *Cheshire Medical Center, Dartmouth-Hitchcock, USA*

Panel Discussion

End of Conference

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SCIENTIFIC ABSTRACTS

VIRTUAL EVENT

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March 21, 2023

ADV. CARDIOLOGY 2023

Factors associated with early biological aging in older people with HIV

Isaura Romero Peixoto[1,2], Ladjane Santos Wolmer de Melo[2] and **Heloisa Ramos Lacerda[1,3]**

[1]Post-Graduate Program in Tropical Medicine, Federal University of Pernambuco, Brazil
[2]Clinics Hospital of Pernambuco, Federal University of Pernambuco, Brazil
[3]Departament of Clinical Medicine, University of Pernambuco, Brazil

Objective: The advances and availability of antiretroviral treatment has enabled a longer life expectancy for the world's HIV population. However, with its chronicity, premature aging challenges the management of people living with HIV. This study aimed to identify an association between risk factors and premature aging, using the biological age estimated by artificial intelligence (AI) based on deep learning (Aging 3.0).

Method: This was a cross-sectional, analytical study with 59 older people living with HIV and using antiretroviral therapy, recruited by convenience sampling in two HIV referral hospitals in Recife /PE / Brazil, between May/2018 and February/2020.

Results: The mean age of the 59 older people 64.3 years and 66.1% were male. Premature aging was identified in 67.8%. The presence of cannabis and diabetes were significant (p=0.045 and p=0.042, respectively). For current and nadir CD4+ cell counts, participants were divided into groups comparing biological age (BA) and chronological age (CA). Just one group presented no premature aging, whereas the group with premature aging was subdivided into BA>CA up to 4 years and BA>CA in 5 or more years. The prevalence of diabetes and prediabetes was 20.3% and 35.6%, respectively, and the significant risk factors were physical activity, coronary disease, risk of cardiovascular disease in ten years, HDL cholesterol levels and glycemia.

Conclusion: our results suggest that older people living HIV experienced early biological aging, as estimated by a set of peripheral blood biomarkers, and chronic diseases not related to AIDS.

Biography

- Graduated in Medicine from University Federal of Pernambuco (UFPE)
- Medical Residency in clinical area by University of Pernambuco UPE)
- Post-Graduation in Cardiology from UPE
- Title of Specialist in Adult Intensive Care by the Brazilian Society of Intensive Care
- Specialization in Palliative Care from the University of Brasilia
- Master in Medicine from UFPE
- PhD in Tropical Medicine from UFPE
- Teacher in Medicine at UFPE
- Teacher in Medicine at University Tiradentes

Bedside ultrasound RUSH process improves the quality of anesthesia for elder emergency surgery patients

Dawei Liu[1] and **Jingfei Sun[2]**

[1]Department of Anesthesiology, Yongchuan Hospital of Chongqing Medical University, China
[2]Department of Anesthesiology, Chongqing Yongchuan Dakang Hospital of Traditional Chinese Medicine, China

Objective: The bedside ultrasound RUSH process is an assessment of patient's heart function, volume status, and vasculature, which can help anesthesiologist understand the patient's physical condition. In this study, the RUSH process was applied to elderly emergency surgery patients to evaluate whether it is beneficial to maintain the patient's vital signs stable during the operation.

Methods: One hundred elder patients who needed general anesthesia and emergency surgery from January 2021 to July 2021 were randomly divided into RUSH group (group A, n=52) and control group (group B, n=48). The main result include the area under the intraoperative blood pressure curve (AUC), liquid input, urine output, lactic acid levels, number of vasoactive drugs used.

Results: There were no significant differences in patients' basic information, preoperative blood pressure, intraoperative blood loss, intraoperative fluid input, intraoperative blood transfusion, and urine output. Intraoperative systolic blood pressure less than 90mmHg AUC of group A is less than group B($P<0.05$), diastolic blood pressure less than 60mmHg AUC of group A is less than group B($P<0.05$). After the operation, the blood gas analysis lactic acid level in group A was lower than that in group B($P<0.05$). Group A used more vasoactive drugs than group B($P<0.05$).

Conclusion: The bedside ultrasound RUSH process is of great significance for anesthesiologist to understand the preoperative physical condition of elder emergency surgery patients, and is beneficial to maintain the stability of intraoperative vital signs.

Biography

Dawei Liu, male, 34 years old, anesthesiologist, has been engaged in clinical anesthesia for more than 10 years, and has completed more than 15000 cases of clinical anesthesia. He is good at critical ill patients treatment, transesophageal echocardiography and body surface ultrasound. In teaching, he has supervised more than 20 residents and standardized trainees. In terms of scientific research, he undertook two scientific research projects as the first person in charge and published more than 10 papers.

miR-221/222-3p act as potential circulating factors in heart failure promoting cancer progress

Zhenjun Ji, Yang Xu, Wanxin Wang, Xiaoguo Zhang, Rui Zhang and **Genshan Ma**

Department of Cardiology, Zhongda Hospital, School of Medicine, Southeast University, China

Objectives: Heart failure (HF) patients usually suffer from death due to multiple cardiogenic and noncardiac causes, especially cancer. There is still limited information about how heart failure promotes the development of cancer. Here, we aim to clarify the potential roles of miR-221/222-3p in heart failure.

Methods: Comprehensive analysis of various bioinformatics tools including TargetScanHuman, Human miRNA tissue atlas, RNA structure, miRNET, DAVID, Enrichr, FunRich, STRING, MalaCards, miRcancer, OncoLnc, miRTargetLink, GEPIA, cBioportal, GEO database and Cytoscape were performed, and Pubmed was the literature searching website. HT-29 cell line (Human colon cancer cells) was used for *in vitro* validation. 40 patients with CAD from Zhongda Hospital, Southeast University were enrolled in this study. They were divided into heart failure group and non-heart failure group. Serum (5% in complete medium) from patients with or without heart failure were added into the culture of HT-29 cells. qRT-PCR was used for serum miR-221/222-3p detection. CCK8 and Edu were used for proliferation detection of HT-29 cells.

Results: miR-221/222-3p were widely distributed in diversified tissues and organs including heart. PPI network of STRING revealed that miR-221/222-3p was closely associated with heart failure, while KEGG biological pathway indicated functions of miR-221/222-3p was mainly cancer-related. Several tools based on TCGA database revealed the stimulating or inhibiting roles of miR-221/222-3p in multiple different kind cancers. Finally, cytoHubba plug-in of cytoscape indicated that miR-221/222-3p act as the key regulators among the progression of several common malignant tumors through their target mRNAs. Validation experiments showed that miR-221/222-3p was elevated in serum of patients with heart failure and human colon cancer cells treated by serum of patients with heart failure. Serum from patients with heart failure promoted proliferation of human colon cancer cells.

Conclusion: miR-221/222-3p, which are upregulated in heart failure, may be important linkers between heart failure and cancers, and promote cancer progress.

Biography

Zhenjun Ji, majored in cardiology, doctoral student from Southeast University, China. The author is currently engaged in the basic study about myocardial infarction and inflammation.

Baicalin Alleviates LPS-Induced oxidative stress via NF-kB and Nrf2–HO1 signaling pathways in IPEC-J2 cells

Xiaoxi Liu and **Minglong Bao**
Guangdong Ocean University, China

Baicalin is a natural plant extract with anti-inflammatory and anti-oxidant activities. However, the molecular mechanism of baicalin on oxidative stress in IPEC-J2 cells exposed to LPS remains to be unclear. In this study, LPS stimulation significantly increased Toll-like receptor 4, tumor necrosis factor-a, and interleukins (IL-6 and IL-1β) expression in IPEC-J2 cells, and it activated the nuclear factor (NF-kB) expression. While, baicalin exerted anti-inflammatory effects by inhibiting NF-kB signaling pathway. LPS stimulation significantly increased the levels of the oxidative stress marker MDA, inhibited the anti-oxidant enzymes catalase and superoxide dismutase, which were all reversed by baicalin pre-treatment. It was found that baicalin treatment activated the nuclear import of nuclear factor-erythroid 2 related factor 2 (Nrf2) protein, and significantly increased the mRNA and protein expression of its downstream anti-oxidant factors such as heme oxygenase-1 and quinone oxidoreductase-1, which suggested that baicalin exerted anti-oxidant effects by activating the Nrf2-HO1 signaling pathway. Thus, pretreatment with baicalin inhibited LPS - induced oxidative stress and protected the normal physiological function of IPEC-J2 cells via NF-kB and Nrf2–HO1 signaling pathways.
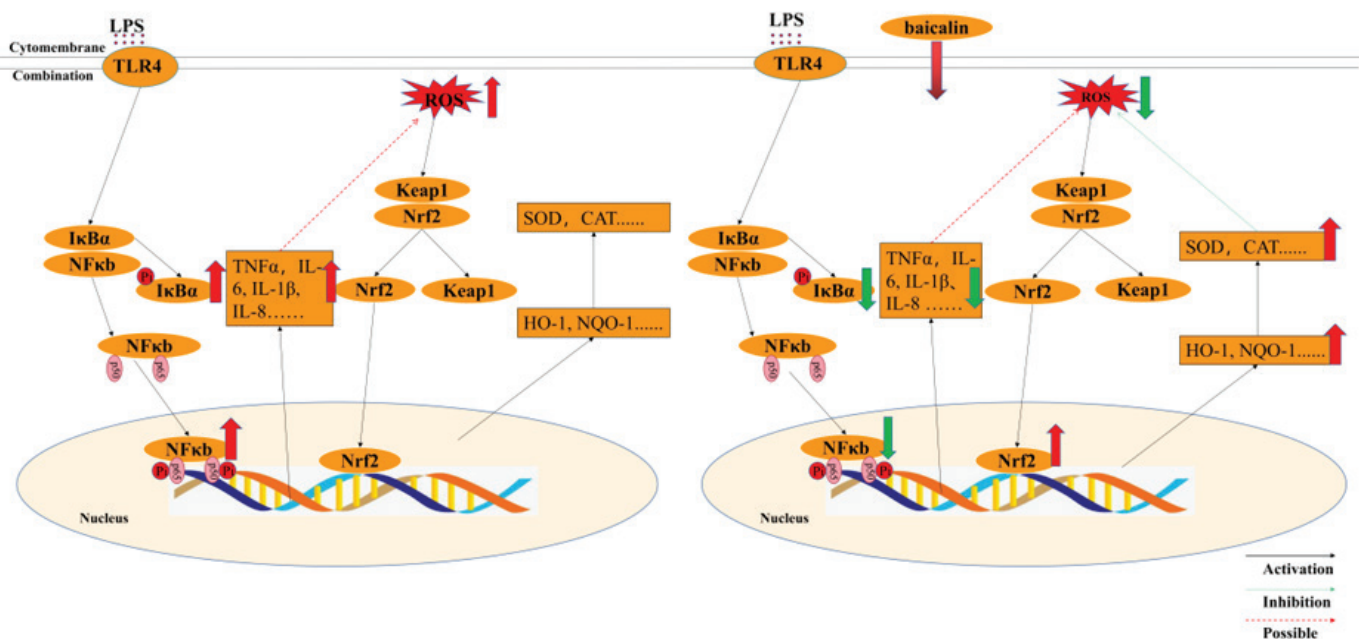
Biography

Xiaoxi Liu, male, doctor of clinical veterinary medicine (traditional Chinese veterinary medicine), master's supervisor of China Guangdong Ocean University. At present, I am engaged in the teaching and do the research of traditional Chinese veterinary medicine in the department of Animal Medicine, coastal Agricultural College, Guangdong Ocean University.

Real-time infection monitoring via wearables

D. Berckmans[1,2] and **A. Pena Fernandez[1]**
[1]KU Leuven, Belgium
[2]University of Tennessee, USA

Studies show promise of using wearables to detect infections, including Covid-19, by analyzing heart rate values. Heart rate is individually different and is influenced by several variables other than illness. Unlike published population approaches, we validated an individualized real-time model, estimating the metabolic energy balance every minute and adapting to the individual and his/her time varying responses. From 2.634 individuals we selected 185 subjects with reliable data from a simple wearable from minimal 90 days up to 3 years and reliable data of a reference test for infection. We used all data monitored 24/7 from all participants and ran the algorithm with a moving window (model update every minute). When the algorithm detected an infection in three used datasets, we gave a notification with request for infection reference test. For data set four, we ran the algorithm in a moving window over all the data and relied on the available reference data of infection. The algorithm detects infections with sensitivities up to 75% for Covid-19 and 90% for other infections monitored, with specificities from 80 to 93%. 78% of the infection alarms happen before the infection event with an average of 5 ± 4 days before the infection, with a maximum of 18 days of detecting pre-symptomatic infections. Unlike all published multiparameter and black box approaches, this solution offers medical experts interpretable and objectively measured information on the metabolic energy used for basal metabolism, for physical performances, for mental activities and for the immune system.

Biography

Daniel Berckmans has a master's and a PhD in Bioengineering. Headed as Full Professor for over 20 years the research Division M3-BIORES (Measure, Model and Manage Bio-responses), Department of Biosystems at the Catholic University of Leuven (⁰1425, 62.000 students) and is Adjunct Distinguished Professor at the University of Tennessee USA. His research focus is on real time monitoring of health and wellbeing of individual humans and animals. He co-authored over 340 peer reviewed publications, over 450 conference papers, participated in 64 PhD commissions in 9 countries and promoted over 250 Master theses. He is co-inventor of 20 patents and coordinated several EU-projects. Daniel is worldwide considered as the spiritual father of the field of Precision Livestock Farming (PLF): real-time monitoring of animals with technology: microphones, cameras, and sensors. He co-initiated the first European Master's in Human Health Engineering at the KU Leuven: technology for monitoring healthy people.

The clinical management of Pompe Disease: A pediatric perspective

Jorge Sales Marques

Hospital Cuf Trindad, Portugal

Pompe disease (PD) is an inherited metabolic disorder caused by a deficiency of acid α-glucosidase (GAA), leading to lysosomal accumulation of glycogen, mainly in skeletal and car- diac muscles as well as the nervous system. Patients with PD develop cellular dysfunction and muscle damage. PD can be classified into two classic forms, namely infantile-onset PD (IOPD) and late-onset PD (LOPD). Delayed treatment, particularly in IOPD, would result in significant organ damage and early death. Nonetheless, early diagnosis and timely treatment are often hampered by the rarity of PD and its wide variety of, but overlapping, symptoms. This article reviews the common clinical presentations of PD and outlines the essentials of PD management. In particular, the implications of newborn screening (NBS) and clinical performance of enzyme replacement therapy (ERT) are highlighted.

Biography

- Jorge Sales Marques, pediatrician, with subspecialties in pediatric endocrinology, medical genetics and metabolic diseases.

- He graduated from the Faculty of Medicine of the University of Porto.

- He trained in Paris, at the Enfant Malade hospital and in Santiago de Compostela, at the Hospital Clínico Universitário.

- He was Director of Pediatrics in Macau and Vila Nova de Gaia/Espinho, founder and President of the Pediatric Association of Gaia and member of the National Committe for Early Diagnosis in Portugal.

- He was President of the College of Pediatrics of the Medical Academy of Macau and member of its Board. He has been a speaker at more than 270 meetings in different countries.He has published over 150 articles on pediatrics, genetics, metabolic and endocrine diseases in prestigious international and national journals.

- He was President of the Pediatric Endocrinology Section of the Portuguese Society of Pediatrics. Won a total of 33 awards in Portugal and abroad.

- He published seven pediatric books. Currently is the Clinical director of Hospital Cuf Trindade – Portugal

Postoperative Results of the *In Situ* Fenestrated Open Stent Technique (FeneOS) for Acute Aortic Dissection Type A

Shuhei Azuma

Department of Cardiovascular Surgery, Kyoto Katsura Hospital, Japan

Objective: Total arch replacement is commonly used for acute aortic dissection type A at some facilities, especially since open stent grafting became commercially available in Japan. Left subclavian artery (LSCA) reconstruction involves deep view manipulation, is difficult to expose and anastomose, and involves the risk of complications and surrounding vascular injury.

Methods: We evaluated 137 patients (mean age 73.8 ± 15.6 years) who underwent total arch replacement for acute aortic dissection type A, at our hospital between September 2014 and March 2022, and divided them into two groups: 70 patients for total arch replacement with fenestrated open stent technique (FeneOS), and 67 for conventional total arch replacement with the reconstruction of three-branch cerebral vessels. We performed FeneOS by deploying the graft from the entry of the left subclavian artery into the descending aorta and fenestrating the LSCA side of the stenting portion. The four-branched artificial vessel was then anastomosed between the left common carotid artery and LSCA.
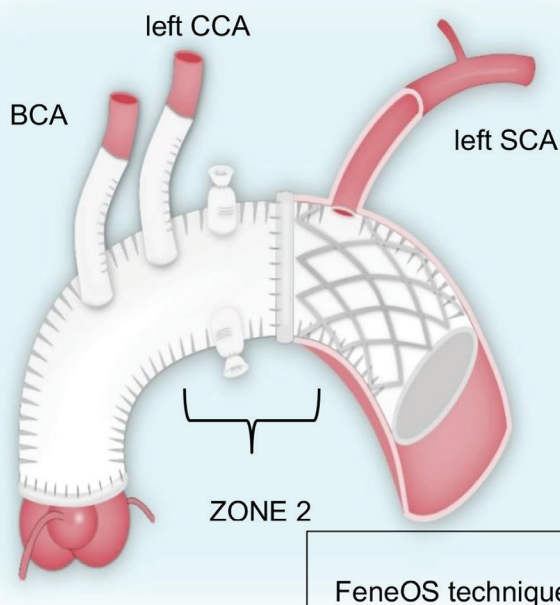

Figure The schematic illustration showed the surgeon-made in situ *fenestrated open stent technique(FeneOS). The diameter of the stent graft was selected by one of 100-110% the size of the true-lumen, or the same size of the diameter of the descending aorta, determined by preoperative CT measurements. The length of the FET was selected to ensure that the distal end was placed above the aortic valve level of descending aorta. Subsequently, a hole of the same size as the entrance of the LSCA was manually created with a sharp-bladed scalpel at 10mm from the proximal end of the FET. We then performed distal anastomosis at Zone 2 without any additional fixation procedures for the fenestration.*

Results: The surgical results of FeneOS were satisfactory and enabled significant reductions in operative time, selective cerebral perfusion time, cardiopulmonary bypass time, and lower body circulatory arrest time. Long-term observation (mean follow-up = 5.5 years) showed no left recurrent laryngeal nerve palsy or postoperative problems with left subclavian artery blood flow.

Conclusions: FeneOS can minimize LSCA exposure because there is no need for LSCA reconstruction, reducing operation time and avoiding the risk of left recurrent laryngeal nerve injury and bleeding problems associated with LSCA exposure and anastomosis during left subclavian artery exposure.

The American Heart Association classification of blood pressure and the determinants of hypertension among medical practitioners in Bayelsa State: A cross-sectional study

T. Okoro[1] and **J Leader[2]**

Department of Internal Medicine, Niger Delta University Teaching Hospital, Nigeria

Hypertension is a major risk factor for cardiovascular diseases (CVD). The objective was to assess the prevalence of hypertension using the 2017 American Heart Association/American College of Cardiology (AHA/ACC) guidelines and its determinants among Medical Practitioners in Bayelsa State, Nigeria. Two hundred and forty-four apparently healthy medical doctors were recruited. A structured self-administered questionnaire was used to gather data on CVD risk factors. Anthropometric and blood pressure measurements were taken. Association between hypertension and sociodemographic features, anthropometric measures, smoking, alcohol, fruit and salt intake, and exercise was explored with chi-square for proportions. Predictors of hypertension were identified by two-step binary logistic regression. A third of the participants were women (29.9%), most were below the age of 30 years (40.2%) and married (54.9%). One-fifth were consultant/professor cadre (18.9%) and a third had worked ≥11 years as medical practitioners. Almost 2 in every 3 of the participants (63.1%) were considered hypertensive by the AHA 2017 classification. However, using a cut-off of ≥140/90mmHg used by other guidelines gave a prevalence of 25%. Only 13.5% had been diagnosed as hypertensive prior to this study. The most important predictor of the occurrence of hypertension was age, although marital status, salt intake, work cadre, and duration of practice were also significantly associated with the occurrence of hypertension. The use of the 2017 ACC/AHA hypertension guidelines for the diagnosis of hypertension with a blood pressure cut-off ≥ 130/80 mmHg resulted in a marked increase in the prevalence of hypertension in medical doctors compared to other guidelines that use a cut-off value of 140/90mmHg (63.1% versus 25%). Increasing age is a significant predictor of hypertension in medical doctors. Guidelines that are best suited for our local settings for the diagnosis of hypertension are recommended.

Biography

Tamaraemumoemi Okoro is a Fellow of the West African College of Physicians. She is an internal medicine physician and a cardiologist. She has served as the Head of the Cardiology Unit at Niger Delta University Teaching Hospital since 2010. She is an associate professor and was the Head of the Department of Internal Medicine, at Niger Delta University, Nigeria, from 2015 to 2021 and the Sub-Dean at the Faculty of Clinical Sciences at Niger Delta University from 2019 to 2021. She is currently undergoing a Ph.D. program in public health at Morgan State University, Maryland, USA. She has over 30 publications in peer-reviewed journals.

Hypoxia aggravates inhibition of Alveolar Epithelial Na-Transport by Lipopolysaccharide-Stimulation of Alveolar Macrophages

Emel Baloglu[1,2], Kalpana Velineni[2], Ezgi Ermis-Kaya[2] and **Heimo Mairbäurl[2,3,4]**

[1]Department of Medical Pharmacology, School of Medicine, Acibadem Mehmet Ali Aydinlar University, Turkey
[2]Translational Lung Research Center Heidelberg (TLRC-H), Part of the German Center for Lung Research (DZL), Germany
[3]Medical Clinic VII, Sports Medicine, University Hospital Heidelberg, Germany
[4]Translational Pneumology, University Hospital Heidelberg, Germany

Inflammation and hypoxia impair alveolar barrier tightness, inhibit Na- and fluid reabsorption,and cause edema. We tested whether stimulated alveolar macrophages affect alveolar Na-transport and whether hypoxia aggravates the effects of inflammation, and tested for involved signaling pathways. Primary rat alveolar type II cells (rA2) were co-cultured with rat alveolar macrophages (NR8383) or treated with NR8383-conditioned media after stimulation with lipopolysaccharide (LPS; 1 µg/ml) and exposed to normoxia and hypoxia (1.5% O_2). LPS caused a fast, transient increase in TNF-α and IL-6 mRNA in macrophages and a sustained increase in inducible nitric oxide synthase (NOS2) mRNA in macrophages and in rA2 cells resulting in elevated nitrite levels and secretion of TNF-α and IL-6 into culture media. In normoxia, 24 h of LPS treated NR8383 decreased the transepithelial electrical resistance (TEER) of co-cultures, of amiloride-sensitive short circuit current (ISCΔamil); whereas Na/K-ATPase activity was not affected. Inhibition was also seen with conditioned media from LPS-stimulated NR8383 on rA2 but was less pronounced after dialysis to remove small molecules and nitrite. The effect of LPS-stimulated macrophages on TEER and Na-transport was fully prevented by the iNOS-inhibitor L-NMMA applied to co-cultures and to rA2 mono-cultures. Hypoxia in combination with LPS-stimulated NR8383 totally abolished TEER and ISCΔamil. These results indicate that the LPS-stimulation of alveolar macrophages impairs alveolar epithelial Na-transport by NO-dependent mechanisms, where part of the NO is produced by rA2 induced by signals from LPS stimulated alveolar macrophages.
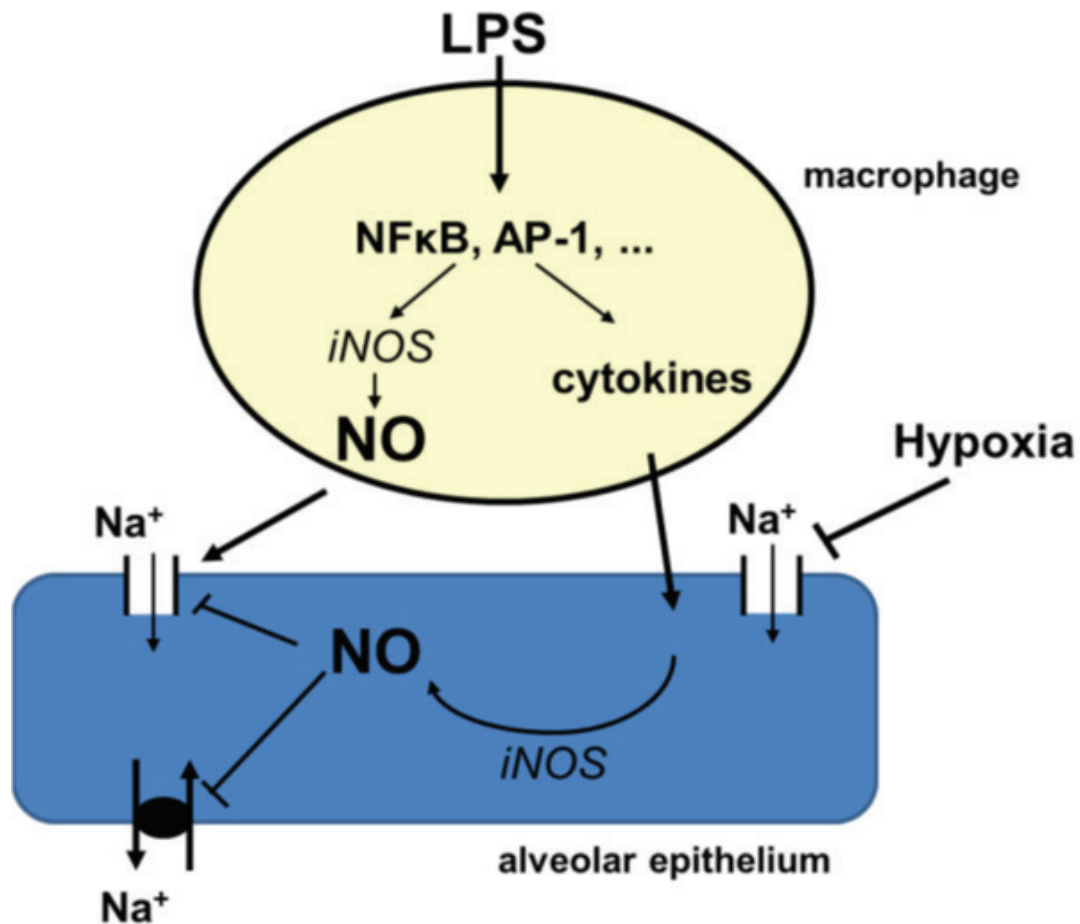
Figure 1. Alveolar macrophages release cytokines, chemokines, nitrite, and related products upon stimulation with LPS which impair alveolar epithelial Na-transport by NO-dependent mechanisms that can be prevented by blocking iNOS activity in macrophages. iNOS is also activated in alveolar epithelial cells in response to cytokine and nitrite related products released from activated macrophages. Hypoxia by its direct effects on the alveolar epithelium additively inhibits alveolar epithelial barrier tightness and ion transport in lung inflammation.

Biography

Emel Baloglu received her MD degree in Turkey from Ankara University, School of Medicine in 2000 and PhD degree from the Department of Pharmacology and Clinical Pharmacology in 2006 from the same university. She did her postdoc studies in Germany at Heidelberg University, Translational Lung Research Center Heidelberg (TLRC-H), part of the German Center for Lung Research (DZL) in 2006-2014. Since 2014 she is working as Associate Professor at Acibadem University, School of Medicine, Department of Medical Pharmacology, İstanbul, Turkey.

Her research focuses on the regulation of ion transporters in pulmonary and cardiovascular diseases *in vitro* and in-vivo. She is interested in the role of cellular stress mediated signaling events and their impact on ion channel and transporter functions particularly Na channels and Na/K-ATPase.

Dynamics of deformational properties of the left ventricle in patients with coronary artery disease complicated by heart failure with preserved ejection fraction

Bekmetova F.M., Doniyorov Sh.N., Alieva R.B., Bekbulatova R.Sh., Karimov B.S., Xotamova M.N., Ilkhomova L.T., Bekmetova S.I. and **Arslonov S.F. Yuldashov A.A.**

Republican Specialized Scientific and Practical Medical Center of Cardiology, Uzbekistan

Aims: to study the effect of revascularization on the deformational properties of the left ventricle in patients with coronary artery disease (CAD) complicated by chronical heart failure with preserved ejection fraction (HFpEF).

Methods and Result: The study included 70 patients with CAD complicated by HFpEF aged between 39 and 74 years. All patients underwent the following examinations: assessment of traditional risk factors, physical examination, general clinical and laboratory blood tests, 12-lead ECG, 24-hour ABPM, transthoracic echocardiography, two-dimensional speckle-tracking echocardiography (STE), ultrasound examination of the carotid artery lesions, and coronary angiography (CAG). All patients were divided into 2 groups: Group I - 36 patients with a single-vascular lesion of the coronary arteries and the average GLS index was -17,76±0,66%; Group II – 34 patients with two-vessel coronary artery disease and the average GLS score was 15,77±0,57%. All patients underwent complete anatomical successful revascularization by percutaneous intervention (PCI). After 48 hours and 30 days after revascularization, EF and GLS were determined.

Left ventricular ejection fraction (LVEF) obtained using the modified biplane Simpson's method. A more objective quantitative assessment of the contractile function of the LV myocardium was obtained by assessing the global longitudinal strain (GLS). Within 48 hours after revascularization the average GLS index was -17,81±0,63% (p>0,05) and -15,76±0,63% (p>0,05) respectively. 30 days after revascularization the average GLS index was -18,12±0,63% (p=0,015) and -16,13±0,71 (p=0,024) respectively.

Conclusion: The results obtained indicate that in patients with CAD complicated by HFpEF there is no improvement in the deformation properties of the left ventricle within 48 hours after revascularization, but after 30 days there is a significant improvement in the deformation properties of the left ventricle.

Biography

Dr. Feruza Bekmetova studied Medicine at the Tashkent State Medical Institute, Uzbekistan and graduated as MS in 1990. She then joined the research group in Scientific Center of Cardiology Department of Cardiology, Tashkent, Uzbekistan. She began her career simultaneously at the Center for The Development of Professional Qualification of Medical Workers Tashkent, Uzbekistan and Republican Specialized Scientific and Practical Medical Center of Cardiology, Tashkent, Uzbekistan where she works as Head of the Functional diagnostics department. She received her DSc degree in 1997 at the same institution. She has published more than 50 research articles in international and local.

Kinetics of Granuloma, IFN-γ and IP-10 in a wistar rat model infected with *Mycobacterium Tuberculosis*

Bobby Singh[1] and **Reviono Reviono[2]**

[1]*Student of Doctoral Programme, Faculty of Medicine, Sebelas Maret University, Indonesia*
[2]*Department of Pulmonology and Respiration Medicine, Dr.Moewardi Hospital/Faculty of Medicine, Sebelas Maret University, Indonesia*

Background: Improved access and treatment are critical to controlling the problem. Molecular diagnostic tests, although available, are not feasible in developing countries. Where available, these tests require state-of-the-art laboratories and are not cheap. One alternative to molecular diagnostics is the use of acute phase protein values. This protein is a protein whose levels will increase or decrease in plasma in response to injury or inflammation.

Objective: This study aimed to analyze the kinetics of granulomas and the role of IFN-γ and IP-10 in the pathology of tuberculosis in a rat model.

Methods: Sixty Wistar rats were divided into four groups, namely the control group (without MTB induction) and the MTB-induced group (observations at week-3, week-6, and week-12 post infection). Induce tuberculosis with bacterial strain H37Rv ATCC 27294.
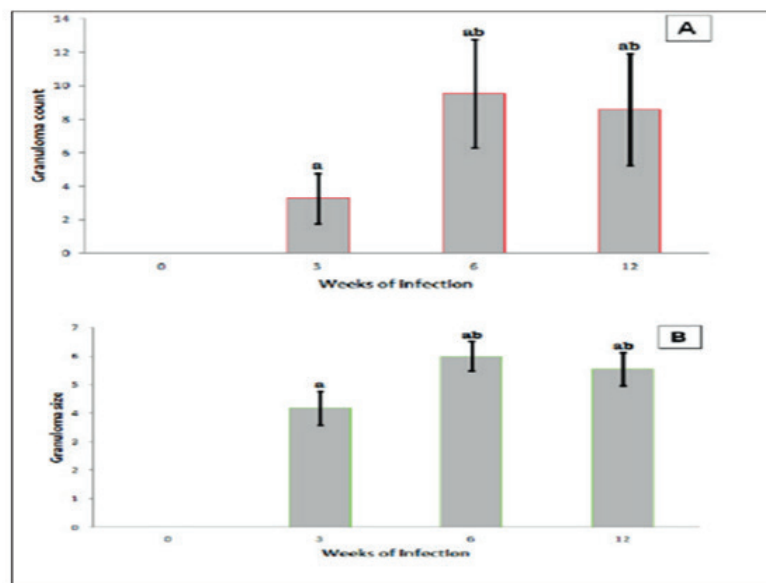
Figure 1. The number (A) and size (B) of granuloma from all group. a: $p < 0.05$ in comparison with the control group; a: $p < 0.05$ in comparison with the tuberculosis group at weeks-3 of observation.

Cytokine	Control	Weeks 3	Control	Weeks 6	Control	Weeks 12
IFN-γ	105.45 ± 3.57	130.61 ± 3.85^a	105.92 ± 5.08	142.55 ± 4.17^{ab}	95.09 ± 4.64	118.38 ± 5.36^{abc}

Table 1. The levels of cytokine in each weeks of observation Note: a: p < 0.05 in comparison with its control group at similar observation time; b: p < 0.05 in comparison with infection group at weeks of 3; c: p < 0.05 in comparison with infection group at weeks of 6.

Cytokine	Control	Weeks 3	Control	Weeks 6	Control	Weeks 12
IP-10	481.79 ± 10.12	680.45 ± 21.79^a	484.36 ± 11.35	726.20 ± 7.64^{ab}	482.5 ± 7.41	530.39 ± 20.80^{abc}

Table 2. The levels of IP-10 chemokine in each weeks of observation. Note: a: p < 0.05 in comparison with its control group at similar observation time; b: p < 0.05 in comparison with infection group at weeks of 3; c: p < 0.05 in comparison with infection group at weeks of 6.

Results: The number and size of the granuloma increased to a peak at week 6 and was consistent for weeks 6 and 12 post-infections. The kinetics of granulomas were consistent with IFN-γ and IP-10 levels.

Conclusion: It was concluded that the model of tuberculosis infection by the H37Rv ATCC 27294 strain in Wistar rat found granuloma characteristics and IFN-γ and IP-10 patterns in similar kinetics, so that there was involvement of these molecules in TB pathology. Thus, tuberculosis infection of the H37Rv ATCC 27294 strain in rats can serve as a model for rapid tuberculosis study and display a complete pathological phase.

Biography

The author was born in Yogyakarta, August 15, 1982. The author is a pulmonary specialist at Puri Medika Hospital Jakarta and is also the Director of the Puri Medika Nursing Academy Jakarta. The author completed his medical education at Krida Wacana Christian University in 2007. Then the author continued his education at the Pulmonary Specialist Program and Master of Health at Sebelas Maret University Surakarta and graduated in 2016. The author graduated as Doctor of Medicine at Sebelas Maret University Surakarta in 2022. He also Has teaching experience at the Faculty of Medicine at the National Veterans Development University, Jakarta. The author has obtained the copyright for the aerosol chamber props and several publications in Scopus Indexed International Journals. The author is active in the activities of domestic organizations including the Indonesian Medical Association (IDI), Indonesia Pulmonologist Association Fellow of the Indonesian Society of Respirology and the Indonesian Society of Respirology (FISR) as well as foreign organizations including the Asian Pacific Society of Respirology (APSR), European Respiratory Society (ERS), American Thoracic Society (ATS), Indonesian Health Research Association (APKESI), American College of Chest Physicians (CHEST), American College of Physicians (ACP), International Society for Quality in Health Care (FISQua), International Maritime Health Association.

ST segment resolution after thrombolysis in acute myocardial infarction as a predictor of outcome

Gundapaneni Sri Ram Charan and **P.Yasodamma**

Rangaraya Medical College, India

Background: Acute myocardial infarction is a major diagnosis in hospital admissions. In ST elevation myocardial infarction (STEMI), the primary goal of treatment has been to restore normal blood flow in the blocked epicardial coronary artery as quickly as possible. Therefore, the best treatment objective is reperfusion, which entails nutritional blood flow at the tissue level. In individuals with STEMI, thrombolytic therapy has been shown to have beneficial effects. If provided within the time frame (within twelve hours of onset of clinical manifestations), there would be a time-dependent reduction in mortality and morbidity.

Methodology: This is a prospective study conducted in Department of Cardiology,GGH-KAKINADA, from January 2021 to June 2022 with a sample size of 100 patients who are diagnosed as STEMI according to ACC guidelines. Serial ECGs are taken following thrombolysis. Patients will be categorized into 3 groups: Complete ST segment resolution group (>70% resolution following thrombolysis), partial resolution group (30% to 70% resolution), no resolution group (<30% resolution) and incidence of adverse events will be compared between the three groups.

Results: It was observed that patient's showing greater than 70% ST-segment resolution is closely related to reduced adverse outcomes throughout the hospital stay and lower in-patient mortality. Patients showing less than 30% ST- segment resolution connected to increased adverse events and in-hospital mortality.

Conclusion: The percentage of ST-segment resolution 90 minutes subsequent to thrombolysis is a simple and non invasive method and serves as a prognostic indicator of outcome that aids in risk stratification of patient.

CMV Myocarditis

Sai Tharun R
RVM Institute of Medical Sciences, India

TORCH infections, this is the term give to a group of infections that can be passed to the infant during pregnancy, at delivery or after birth. TORCH stands for Toxoplasmosis, Rubella, Cytomegalovirus (CMV), Herpes Simplex Virus (HSV). Among TORCH, Cytomegalovirus (CMV) is one of the organism that can infect the baby with a common presentation of a triad – JAUNDICE, HEPATOSPLENOMEGALY, PETECHIAL RASH along with which they also present with low birth weight, microcephaly, seizures, retinitis which slowly develop into more serious complications like hearing loss and developmental delay. CMV Myocarditis is a rare condition where the organism causes inflammation and weakness of the heart muscles presenting with recurrent atral flutter. Here in this case the baby presented with recurrent atrial flutter and pneumonia, upon doing investigations (PCR) the result came out to be positive for CMV DNA .

Artificial intelligence applied to nutritional therapy in Moroccan type 2 diabetics: Methodological approach

S.Chellak[1], K. E.Moutaouakil[2], M. Cheggour[1] and H.Baizri[3]

[1]Morphosciences Research Laboratory, Faculty of Medecine and Pharmacy, Cadi Ayyad University of Marrakech, Morocco
[2]Engeneering Science Laboratory, Faculty Polydisciplinary of Taza, Sidi Mohammed Ben Abdellah University of Fès, Morocco
[3]Bioscience and Health Laboratory, Faculty of Medecine and Pharmacy, Cadi Ayyad University of Marrakech, Morocco

This work aims to present the research project funded by two Moroccan national authorities: the national center for scientific and technical research and the digital development agency. Its main goal is to develop an application based on artificial intelligence that will help Moroccan type 2 diabetics to better choose their meals by helping them to balance their blood sugar. To achieve this, several steps are planned.

At first a food survey was conducted in different regions of Morocco in order to select the most consumed moroccan dishes and determine their composition in nutrients. Also, we have already integrated the principles of modeling and machine-learning, in particular to classify foods and their composition, to determine the nutrient needs of individuals and also to propose a multi- objectives optimal control model to control a population of diabetics taking into account the specificity according to their degree of complication and their response to the proposed diets.
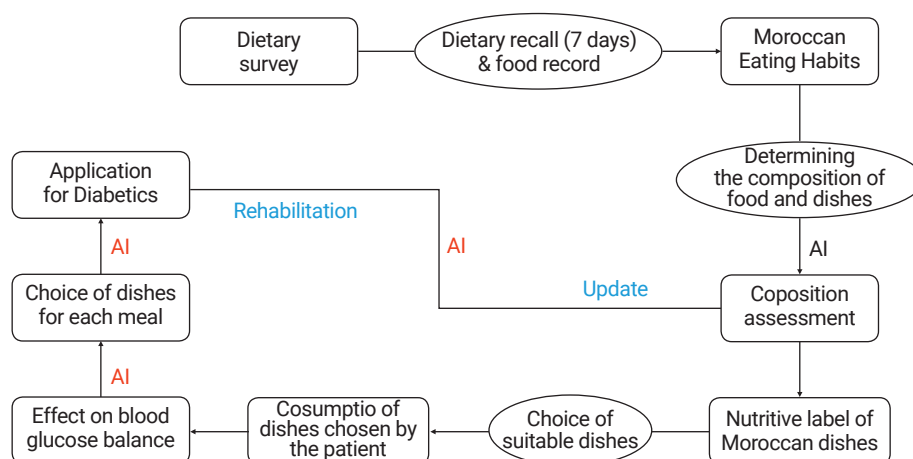
Representative diagram of the methodological approach.

"R to Q substitution at 98, 141 and 162 in *TNNI3* associated with HCM among Indians

Deepa Selvi Rani
CSIR-Centre for Cellular and Molecular Biology, India

Background: Troponin I (*TNNI3*) is the inhibitory subunit of the thin filament regulatory complex Troponin, which confers calcium sensitivity to striated muscle actomyosin ATPase activity. Mutations (2-7%) in this gene had been reported in hypertrophic cardiomyopathy (HCM) patients. However, the frequencies of mutations and associated clinical presentation have not been established in cardiomyopathy patients of Indian origin, hence we have undertaken this study.

Methods: We have sequenced all the exons, including the exon-intron boundaries of *TNNI3* gene in 101 HCM patients, along with 160 healthy controls, inhabited in the same geographical region of southern India.

Results: Our study revealed a total of 16 mutations. Interestingly, we have observed Arginine to Glutamine (R to Q) mutation at 3 positions 98, 141 and 162, exclusively in HCM patients with family history of sudden cardiac death. The novel R98Q was observed in a severe hypertrophic obstructive cardiomyopathy patient (HOCM). The R141Q mutation was observed in two familial cases of severe asymmetric septal hypertrophy (ASH++). The R162Q mutation was observed in a ASH++ patient with mean septal thickness of 29 mm, and have also consists of allelic heterogeneity by means of having one more synonymous (E179E) mutation at g.4797: G$\rightarrow$A: in the same exon 7, which replaces a very frequent codon (GAG: 85%) with a rare codon (GAA: 14%). Screening for R162Q mutation in all the available family members revealed its presence in 9 individuals, including 7 with allelic heterogeneity (R162Q and E179E) of which 4 were severely affected. We also found 2 novel SNPs, (g.2653; G$\rightarrow$A and g.4003 C$\rightarrow$T) exclusively in HCM, and in silico analysis of these SNPs have predicted to cause defect in recognition/binding sites for proteins responsible for proper splicing.

Conclusion: Our study has provided valuable information regarding the prevalence of TNNI3 mutations in Indian HCM patients and its risk assessment, these will help in genetic counselling and to adopt appropriate treatment strategies.

Biography

Dr. Deepa Selvi Rani is from CCMB-CSIR, India. She is interested in understanding the Genetic basis of Cardiovascular Diseases, Male infertility, Mitochondrial disorders, and the Origin of Modern Humans. She has two master's degrees, M.Sc. in Biochemistry and M.Sc. in Biotechnology. Her Ph.D. work was on "Molecular Studies in Cardiomyopathies and Noonan Syndrome." She identified several mutations in sarcomere protein genes causing cardiomyopathies and sudden cardiac arrest. To understand the disease specifically, she studied their molecular mechanisms, which are relevant to pharmacogenomic studies and personalized medicine. Dr. Rani is an enthusiastic, dedicated, outstanding researcher and published mare than 50 papers in peer-reviewed International Journals. She has a 22 h-index with a total of 1602 citations.

Impact of using the modified Devaga Annuloplasty (mDA) using pericardial patch versus Ring Annuloplasty (RA) in Mitral valve replacement with severe functional tricuspid regurgitation(TR): A novel revolutionary technique or just another addition to the surgical conundrum

Deepi Agrawal and **U.E.Jadhav**

Seth GS Medical College and KEM Hospital, India

Objectives and scope: Tricuspid regurgitation in patients with mitral valve disease is associated with poor outcome and predicts poor survival, heart failure, and reduced functional capacity. The objective was to access if mDA using pericardial patch offered significant surgical, functional and economical benefits over RA done for Mitral valve replacement with severe functional tricuspid regurgitation in a predominant rheumatic population.

Methods: This retrospective study analysed data of 50 patients as per our inclusion criteria for the patient who underwent surgery for functional tricuspid valve disease (30 RA and 20 mDA) between period of January 2015 and December 2019 in Kem hospital, mumbai. Post-operatively all patients have routine TTE before discharge and subsequently at 6 months and 1 year. Severity of TR, LVEF, TAPSE and PASP were used for determining functional status of the patient.

Results: There was no statistically significant difference in residual TR. There was significant improvement in NYHA status. Statistically significant difference was seen in the cost,with mDA demonstrating economic benefits for the patient.

Conclusions: Similar functional outcomes were seen with both techniques. Only incremental economic benifit was seen with mDA in the form of lower cost for the patient. However, this is just the early outcome and long term study is on going to ascertain outcome.
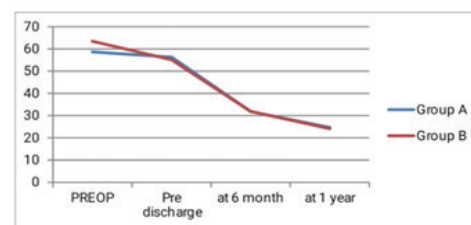

Figure 1: Tricuspid annular plane systolic excursion (TAPSE) at the baseline, early postoperative period, and after six months and 1 year of follow up.
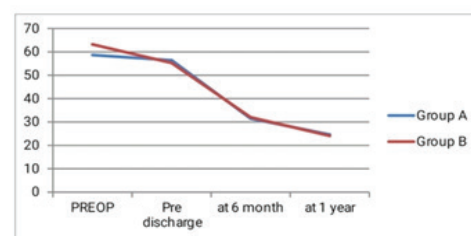

Figure 2: Pulmonary artery systolic pressure (PASP) at baseline, early postoperative, and after six months and 1 year.

Biography

I am Dr Deepi Agrawal Goyal a cardiovascular and thoracic surgeon from India and currently working as an paediatric cardiac surgery fellow at Sri Sathya Sai Sanjeevani hospital, Raipur, India. I have completed my M.CH. CVTS from the prestigious Seth G S medical college and KEM hospital Mumbai. I have special interests in paediatric cardiac surgeries, preventive cardiology and valve surgeries particularly valve repair. I am an avid traveller with keen interest into varied cultures around the world.

The role of Artificial intelligence in the classification of structural brain anomalies

Kirti Raj Bhatele

Department of Computer Science & Engineering RJIT, Border Security Force Academy, India

Artificial intelligence is playing a significant role in the domain of image segregation, interpretation and computer vision in order to automate the task of brain tumor segmentation, anomaly detection, classification and other brain structural disorder prediction at an early stage. The different medical imaging modalities are used by the doctors in order to diagnose the brain tumor and other structural brain disorders, which are an integral part of diagnosis and prognosis process are used in this research domain along with the various artificial intelligence techniques. When these different medical image modalities are used along with various image segmentation methods and machine learning approaches tends to perform brain structural disorder detection and classification in a semi-automated or fully automated manner with high accuracy. This lecture is all about enlightenment regarding the emerging role of Artificial intelligence for brain structural disorder classification in an automated manner to assist the doctors in real time and hence improve their diagnostic capabilities.

Biography

Dr. Kirti Raj Bhatele is working as an Assistant Professor in the Department of CSE in RJIT, Border security Force Academy, Tekanpur, Gwalior, Madhya Pradesh, India. He has about 9 years of teaching and research experience. He has published many research papers in many peer reviewed International journals and Conferences. He has also published one book and twelve E-book chapters. He has received three Government research fellowships from the Madhya Pradesh Council of Science and Technology, Bhopal, M.P, India. His research interest lies in domain of Medical Image Processing, Cyber Security, Machine learning etc.

The PediaFlowTM Pediatric Ventricular Assist Device

H. Borovetz[1], S. Olia[2] and **J. Antaki[3]**
[1]*University of Pittsburgh, USA*
[2]*University of Pennsylvania, USA*
[3]*Cornell University, USA*

Ventricular Assist Devices have revolutionized treatment of adult heart failure with tens of thousands of devices implanted as either a "bridge" to cardiac transplantation or as a permanent "destination" implant (implantation periods exceeding 10 years). There is also a need for ventricular assist devices for treatment of pediatric patients and in particular, infants and small children, with congenital and/or acquired cardiac disease. However, the small market potential for pediatric heart failure patients versus that for adult heart failure patients has limited commercial interest. Under the support of two contract awards from the National Heart, Lung, and Blood Institute of the National Institutes of Health and one award from the Department of Defense Peer Reviewed Medical Research Program, our consortium has designed and validated an implantable, mixed-flow, fully magnetically levitated (maglev), rotodynamic blood pump, the PediaFlow™ pediatric ventricular assist device. The clinical design goal for the PediaFlow™ pediatric ventricular assist device is to support the failed circulation of infants and small children, and consequently most vulnerable patients, for durations consistent with bridge-to-transplant wait list times for donor organs. Our current fifth generation pump prototype is the size of a AA cell battery and can achieve flow rates consistent with circulatory support requirements for infants and small children with minimal damage to the formed elements of blood (Olia et al, 2018). We are also currently developing a "smart" closed-loop pump controller that is in contrast with current clinical-use controllers that operate in fixed-output open-loop mode, and which would allow modulation of pump revolutions per minute consistent with loading and unloading of the heart.

Biography

Dr. Harvey Borovetz is distinguished professor and former chair (2002-2013) in the Department of Bioengineering, Swanson School of Engineering at the University of Pittsburgh; a professor of Chemical and Petroleum Engineering; a professor in the Clinical and Translational Science Institute, University of Pittsburgh School of Medicine; a University Honors College Faculty Fellow; and, the Robert L. Hardesty Professor in the Department of Surgery, University of Pittsburgh School of Medicine. Within the McGowan Institute for Regenerative Medicine, Dr. Borovetz holds the position of Deputy Director of Artificial Organs and Medical Devices. After receiving his BA in Physics from Brandeis University in 1969, Dr. Borovetz went on to earn an MS and a PhD degree, both in bioengineering, from Carnegie Mellon University in 1973 and 1976, respectively. Dr. Borovetz's current research interests are focused on the design and clinical utilization of cardiovascular organ replacements for both adult and pediatric patients.

First-in-human experience of preload regulation with percutaneous transluminal caval flow regulation in heart failure with reduced ejection fraction patients

José E. Herrera[1], José A. Herrera P[1], Bartolome Finizola[1], José Octavio[2], Roberto Levine[3] and Igor Palacios[3]

[1]ASCARDIO, Venezuela
[2]Hospital de Clínicas Caracas, Venezuela
[3]Mass General Hospital, USA

Background: Preload reduction in heart failure has been achieved with high potency diuretics. However, no study has been conducted in humans to assess the effect of inferior vena cava intermittent occlusion for preload reduction.

Objectives: This study aims to investigate the acute haemodynamic effects of percutaneous transluminal flow regulation (PTCR®) with an inferior vena cava regulator balloon in heart failure patients.

Scope: This observational study is to demonstrate that the regulation of the caval flow, the reduction of the total cardiac load produces reversal of the remodeling of and thus offers a new alternative emerging therapy to treat Heart Failure Patients.

Methods: Six patients were included in the study: four men (55 ± 6 years old) and two women (63 ± 4 years old). Baseline evaluations included Doppler echocardiogram, coronary angiogram, and right heart catheterization. Caval balloon was kept inflated for 30 min, and right catheterization and control echocardiogram were performed while the balloon was still inflated. The balloon was then deflated and removed. Right haemodynamic variables were evaluated before balloon insertion and with the inflated balloon.

Results:

Hemodynamic Data Results

	Hemodynamic Variable	Before Balloon	During Balloon	% Change	p Value ≤
1	mRAP (mmHg)	9.00	5.17	- 42.59%	0.005
2	sRVP (mmHg)	44.17	30.83	- 30.19%	0.003
3	mPAP (mmHg)	37.50	28.00	- 25.33%	0.043
4	mPCWP (mmHg)	25.50	17.50	- 31.37%	0.016
5	C.O. (l/min)	4.09	4.50	9.92%	0.175

Echo Data Results

	Echo Variables	Before Balloon	During Balloon	% Change	p Value ≤
1	LVEDD cm	6.43	5.76	-11.0%	0.009
2	LVESD cm	5.19	4.78	-7.9%	0.010
3	LVDV ml	187.67	160.82	-14.4%	0.036
4	LVSV ml	123.23	101.62	-17.0%	0.041
5	EF% Simpson	33.49	40.85	21.9%	0.115
6	E/A ratio	1.72	1.37	-20.5%	0.051

Conclusion: The haemodynamic and echocardiographic changes obtained in our study using PTCR® suggest that this innovative approach can play a beneficial role in the heart failure treatment.

Biography

José E. Herrera, was born in Porlamar Venezuela on October 20, 1953. Married, father of 3 children. Physician graduated from the University of the Andes, Mérida state, Venezuela. in 1977. Approval of the ECFMG USA exam (revalidation of medical degree) March 1979, Postgraduate in Cardiology (Doctor's Degree) at José Ignacio Baldo Hospital (Caracas-Venezuela) and in the University Hospital of Caracas, 1979-1980. Advanced Echocardiography Course at Thomas Jefferson University Hospital, Philadelphia, United States, 1984. He was a faculty at the meetings of the different TCT congresses 2014, 2015, 2016, USA, ICI Meeting held in Israel 2015, 2016, 2017, 2018, 2019, 2020, is recepient the cardiovascular innovation award at the ICI 2015 meeting. He currently has 9 patents for medical device and PTCR procedure USA, Russia, Europe, Geneva and Japan. Scientific article published in the journal ESC Heart Failure 2022. He is a reviewer of the ESC Heart Failure and pace Journal.

Thromboprophylaxis of patients submitted to total hip and knee arthroplasty: A cost-effectiveness assessment from the perspective of the Brazilian National Health System

Artur F S de Brito[1] and **Antônio B S Ferreira Júnior[2]**

[1]Federal University of Bahia (UFBA), Brazil; State Department of Health of the Federal District (SESDF), Brazil; NOVARTIS Biosciences, Brazil
[2]State Department of Health of the Federal District (SESDF), Brazil; Institute of Strategic Health Management of the Federal District (IGESDF), Brazil

Objectives: Venous thromboembolism (VTE) is a serious national and international public health issue. Major orthopedic surgeries, such as a total hip (THA) and knee (TKA) arthroplasties, are associated with an increased risk of VTE, long-term complications, functional disability, and death resulting from hypercoagulability by surgical trauma. This pharmacoeconomic analysis aimed to identify the most cost-effective anticoagulant alternative in preventing VTE in patients undergoing THA and TKA.

Methods: A decision tree model was developed, comparing direct oral anticoagulants (rivaroxaban, apixaban, and dabigatran) with enoxaparin, with separate THA and TKA models a 3-month time horizon from the perspective of the Brazilian National Health System. The results were presented as incremental cost-effectiveness ratio (ICER), and the outcomes analyzed were avoided complications (ACs) after thromboprophylaxis. Comparative effectiveness was obtained from a published meta-analysis. A willingness to pay value of approximately R$ 15 000.00 was used per AC, and a probabilistic sensitivity analysis with the Monte Carlo simulation was conducted.

Results: Apixaban was the anticoagulant that presented the best ICER for patients undergoing THA (R$ 207.52/AC) and TKA (R$ 133.59/AC), followed by rivaroxaban (R$ 347.21/AC), dabigatran (R$ 372.56/AC), and enoxaparin (R$ 711.44/AC) for THA and by dabigatran (R$ 194.07/AC), rivaroxaban (R$ 221.12/AC), and enoxaparin (R$ 747.25/AC) for TKA. After ICER analysis, apixaban prevails over the other technologies analyzed for both surgical procedures, confirmed after sensitivity analysis.

Conclusion: Our model suggests that, in the Brazilian National Health System, apixaban is the most cost-effective alternative in preventing VTE after THA and TKA.

Biography

Generalist Pharmacist from the Catholic University of Brasília. He has experience in public management, health technology assessment, pharmacoeconomics, HEOR, clinical and hospital pharmacy, biotechnology and human genetics. He is a public servant of the Health Specialist Career of the State Department of Health of the Federal District. He served as Director of the Department of Management and Incorporation of Technologies in Health, of the Secretariat of Science, Technology and Strategic Inputs of the Ministry of Health and president of the National Commission for the Incorporation of Technologies in the SUS (CONITEC) and as Assistant Secretary of Health Management and as Secretary of State for Health of the Secretary of State of Health of the Federal District (SESDF) - Substitute. He currently serves as Public Strategic Business Manager at Novartis Oncology.

On the fractal geometry of different heart rhythms

T. Azizi

University of Wisconsin-Madison, USA

In this study, we explore the possibility that ECG recordings belong to class of multifractal process for which a large number of scaling exponents are required to characterize their scaling structures. We use the BIDMC Congestive Heart Failure database including long term ECG recordings from 11 men, aged 22 to 71, and 4 women, aged 54 to 63 with severe congestive heart failure and the MIT-BIH Arrhythmia database that contains 48 half-hour excerpts of two-channel ambulatory ECG recordings, obtained from 47 subjects studied by the BIH Arrhythmia Laboratory between 1975 and 1979. We compare these two chronic heart diseases with the control people in the MIT-BIH Normal Sinus Rhythm database which includes 18 long-term ECG recordings of 5 men, aged 26 to 45, and 13 women, aged 20 to 50 without significant arrhythmia. The vibration analysis such as power spectral densities (PSD) analysis has been performed for differentiating the time series. Multifractal dynamics of heartbeat interval signals have been assessed by multifractal spectrum analysis to differentiate normal signals with arrhythmia and severe congestive heart failure patients. We apply Higuchi algorithm to find the fractal complexity of each cardiac rhythm and then compare the signals for different time intervals. According to our analysis, we investigate that neither the power spectral densities nor the Higuchi algorithm to find the fractal dimension alone were sufficient to separate different classes of patients and healthy people. However, when multifractal analysis and scaling exponent were used as a classifier, the three classes were well separated. In addition, multifractal analysis revealed that we have a narrow range of exponents for arrhythmia and congestive heart failure subjects and as a result, a clear loss of multifractality for them. It was of great significance to show that we have a narrower range of exponents for arrhythmia subject compared to congestive heart failure subject which is useful to recognize these two classes of patients with heart disease. Our findings provide a comprehensive framework for diagnostic and classifying different patients with cardiac disease such as arrhythmia and congestive heart failure and differentiate them with normal people without heart disease which is crucial in finding the best diagnostic and controlling strategy in fight against chronic heart disease.

Biography

As someone who is highly inquisitive and analytical, I am skilled in computational mathematics and mathematical modeling for biological systems and also at developing appropriate model and implementing methodology using data collection and analyzing the results of research. I am currently a Research Associate at University of Wisconsin-Madison. My current work on developing new innovative methods in topological data analysis, computational anatomy and dynamic modelling of brain network using multiple time scale approaches is a neuroscience program in department of biostatistics and medical informatics at University of Wisconsin-Madison. I was a Post-Doctoral Fellow at Florida State University. My work on novel approaches in applied sciences for problems associated with biomedical research specially working on the areas: fractal geometry, and fractional order systems was a program in mechanical engineering department at Florida State University which is designed for outstanding researchers interested in participating in interdisciplinary research at the intersection of mathematics, computer science and biology to formulate new models in biomedical area. During my studies in MS and PhD, I effectively and efficiently learned the fundamentals of biomathematics. My research in one direction focuses on analyzing the behavior and evolution of population dynamics and biological systems. Further, I assisted in the development of appropriate model with application in Pharmacology and Physiology using collected data with great integrity.

Fetal left ventricular aneurysm progressing to dilated cardiomyopathy

G. Challapudi and **R.Komarlu**
Cleveland Childrens Hospital, USA

Background: Fetal dilated cardiomyopathy (DCM) is rare (0.2% of high risk pregnancies), with ventricular dilation and dysfunction. The etiology is heterogeneous, including maternal viral infections, tachycardia induced cardiomyopathy, genetic and metabolic causes.

Prenatally detected cases have a high mortality (~70%), with high rate of spontaneous intra uterine/neonatal death, especially in hydropic fetuses. We report a case of DCM detected prenatally highlighting need for multidisciplinary care.

Case:

Maternal history: A 21 y/o primigravida with h/o facial hemangioma, was referred for fetal echocardiogram at 24 weeks gestation due to left ventricular dilation. She had upper respiratory infection at 6 weeks gestation, with negative testing for CMV, Parvo and toxoplasma. Fetal echocardiogram demonstrated normal intracardiac anatomy, LV apical aneurysm and normal function (Figure 1). Mother developed polyhydramnios at 32 weeks gestation and underwent amnioreduction. Fetal echocardiogram at that time revealed normal intracardiac anatomy, thin walled, severely dilated and dysfunctional left ventricle with severe mitral regurgitation, small to moderate circumferential pericardial effusion, trivial right pleural effusion, without scalp edema/ascites (Figure 1). Fetal heart rate was regular with normal sinus rhythm. Delivery was planned in SDU with anticipation of an "exit to ECMO" strategy.

Postnatal course: A male infant was born at 37 weeks gestation via C-section; birth weight 3.515Kg. He was immediately taken to Cath lab after intubation on inotropic support.

Balloon atrial septostomy with atrial septal stent was performed; postnatal echocardiogram confirmed findings (Figure 2). Heart transplant evaluation was initiated on D0, listed on D4 (UNOS 1A), Berlin LVAD on D12, transplantation at 2 months old. Pathology of the explanted heart revealed abundant myocardial glycogen accumulation consistent with primary storage process involving glycogen metabolism. He is 6 months old with preserved allograft function.

Discussion: We report a unique case of DCM with rapid progression of severe ventricular dysfunction. This case highlights importance of multi-disciplinary involvement from delivery to catheter intervention to heart transplant. Prenatal counselling and planning was crucial for optimal postnatal outcome.
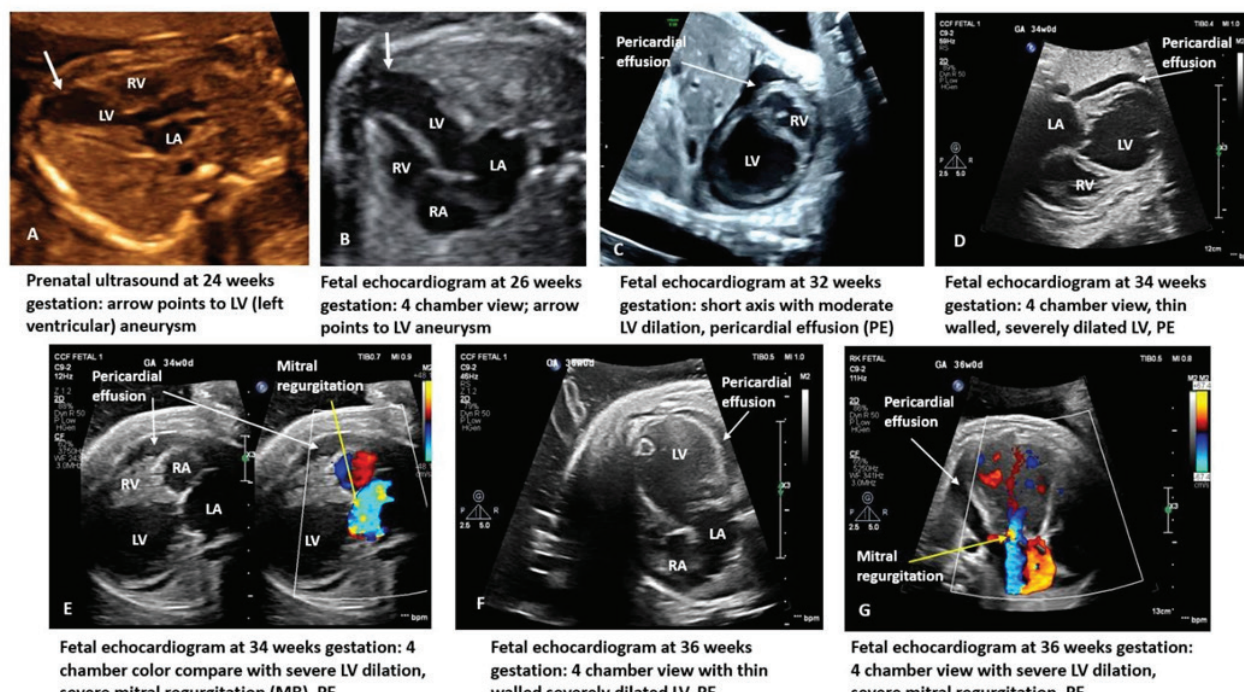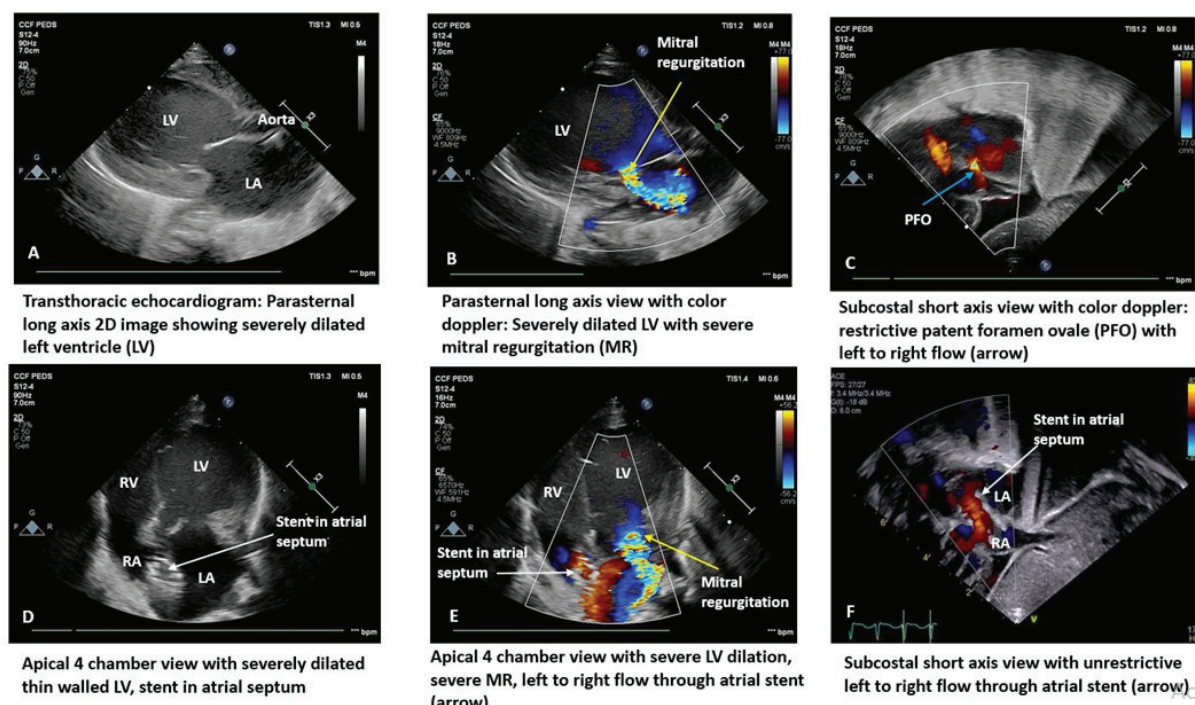
Figures:

Figure 1: Fetal echocardiographic findings.

Prenatal ultrasound at 24 weeks gestation: arrow points to LV (left ventricular) aneurysm

Fetal echocardiogram at 26 weeks gestation: 4 chamber view; arrow points to LV aneurysm

Fetal echocardiogram at 32 weeks gestation: short axis with moderate LV dilation, pericardial effusion (PE)

Fetal echocardiogram at 34 weeks gestation: 4 chamber view, thin walled, severely dilated LV, PE

Fetal echocardiogram at 34 weeks gestation: 4 chamber color compare with severe LV dilation, severe mitral regurgitation (MR), PE

Fetal echocardiogram at 36 weeks gestation: 4 chamber view with thin walled severely dilated LV, PE

Fetal echocardiogram at 36 weeks gestation: 4 chamber view with severe LV dilation, severe mitral regurgitation, PE

Figure 2: Postnatal transthoracic echocardiogram findings.

Transthoracic echocardiogram: Parasternal long axis 2D image showing severely dilated left ventricle (LV)

Parasternal long axis view with color doppler: Severely dilated LV with severe mitral regurgitation (MR)

Subcostal short axis view with color doppler: restrictive patent foramen ovale (PFO) with left to right flow (arrow)

Apical 4 chamber view with severely dilated thin walled LV, stent in atrial septum

Apical 4 chamber view with severe LV dilation, severe MR, left to right flow through atrial stent (arrow)

Subcostal short axis view with unrestrictive left to right flow through atrial stent (arrow)

Biography

I am a pediatric cardiologist with expertise in the field of advanced cardiac imaging and have interests in multimodality imaging, including transthoracic, fetal, transesophageal echocardiography as well as cardiac MRI and CT. My research work includes working as part of multicenter study to assess outcomes and predictors of perinatal mortality in fetuses with Ebstein's anomaly/tricuspid valve dysplasia, role of cardiac MRI in assessing transplant free survival in patients with small left heart structures following conversion to biventricular circulation. Most recently I have worked on assessing novel longitudinal metrics to assess aortic growth trajectories in Marfan syndrome, and assessing left atrial strain and function in patients with hypertrophic cardiomyopathy. My other interests include strain imaging and fetal arrhythmias as well as outcomes research. I am passionate about all aspects of cardiac imaging.

Role of inhalational Aztreonam lysine in lower airway infections in cystic fibrosis: An updated literature review

Mehwish Zeb[1], Sujan Poudel[2,3,4], Sai Dheeraj Gutlapalli[1], Ijeoma A Toulassi[1], Varshitha Kondapaneni and **Ivan Cancarevic[1]**

[1]Internal Medicine, California Institute of Behavioral Neurosciences and Psychology, USA
[2]Family Medicine, California Institute of Behavioral Neurosciences and Psychology, USA
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Cystic fibrosis (CF) is an inherited disorder most prevalent in the Caucasian population, characterized by a functional abnormality of the transmembrane conductance regulator protein that leads to a wide array of complications, including chronic lung infections. Pseudomonas aeruginosa (PA) is a frequently acquired microbe in CF patients and is associated with deterioration in pulmonary function and increased mortality. Inhaled anti-infective agents are an established curative therapy for CF airway infections, especially with chronic PA lung disease. Amongst them, aztreonam lysine for inhalation (AZLI) is an aerosolized monobactam antibiotic aztreonam, approved for use in CF patients nearly a decade ago. This literature review aims to explore studies based on the efficacy, safety, and tolerability of AZLI use in CF patients with pulmonary infections. We searched for all the relevant articles present in PubMed, Google Scholar, Cochrane Library, EMBASE, ClinicalTrials.gov, and Journal of Cystic Fibrosis for our data collection from 2000 to 2020. The use of AZLI has substantially improved lung function, respiratory symptoms, and remarkably reduced sputum PA density in CF patients, thereby improving the patient's overall quality of life. The adverse effects reported were compatible with CF lung disease. Hence, inhalational therapy with AZLI is highly efficacious and safe in the management of chronic airway infections. More clinical trials need to be conducted in the future to assess its long-term clinical benefits and adverse events as well as to explore the role of AZLI in the setting of acute lung infections.

Simvastatin monotherapy vs Simvastatin-Ezetimibe combination therapy: A meta analysis of existing literature

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Background: Cardiovascular disease is the leading cause of death in the United States1 and longstanding hyperlipidemia can cause nearly a fourfold increase in the risk of cardiovascular disease. Statins are currently the mainstay of treatment in hyperlipidemia. Combination therapy of statin with ezetimibe is only indicated for severe hypertriglyceridemia and very high risk ASCVD (atherosclerotic cardiovascular disease) population. There is a paucity of studies comparing statin monotherapy vs combination therapy with ezetimibe. This study aims to perform a meta analysis of the existing literature and compare the effectiveness of statin monotherapy with statin-ezetimibe combination therapy in management of hyperlipidemia

Methods: A systematic electronic search of the scientific literature was performed in PubMed, EMBASE and scopus. Only Randomized controlled trials comparing Simvastatin monotherapy vs Simvastatin-Ezetimibe combination therapy between years 2000-2021 and published in English language were included. 15 studies were included in the final analysis (Fig 1). Main outcomes that were compared were reduction in LDL, HDL and TG.

Results: Our study showed that combination therapy led to a higher reduction of LDL-C (Mean Difference: -20.22[-26.38,-14.07]; $P<0.0001$) and TG values (Mean Difference: -8.10[-15.74,-0.46]; $P=0.04$) compared to monotherapy with statin alone. There was no significant difference in reduction of HDL-C values (Mean Difference: -0.07[-0.45,0.32]; P-0.04) between the 2 groups.

Conclusions: Our study indicates that combination therapy of simvastatin and ezetimibe is more effective in reduction of LDL-C and TG levels compared to Simvastatin monotherapy alone. Our Current guidelines recommend combination therapy only for severe hypertriglyceridemia and severe ASCVD patients, more studies are needed to study effectiveness of simvastatin-ezetimibe combination therapy in low risk ASCVD population.

Biography

I completed my Residency in Internal Medicine from University of Rochester Medical Centre in June, 2017 and have been practicing as hospital medicine physician at Cheshire Medical Center/Dartmouth Health since then. I have an active clinical role, working on the Hospital Medicine floor and in the intensive care unit, by providing night time intensive care physician coverage at Cheshire Medical Centre. I also hold an active teaching role at Dartmouth Medical School by teaching and working with medical students, Nurse practitioner students and providers and provide evaluations.

I am an active clinical researcher and have collaborated with my colleagues and other clinical researchers across the country and published 30+ abstracts and manuscripts, including multiple abstracts presented at various nation-wide conferences during the acute COVID-19 pandemic. I have served as a judge, reviewing abstracts in-person and virtually at various nation-wide conferences. I have reviewed more than 40 scientific manuscripts for various medical journals as noted in my resume.

Field of medicine constantly evolving and point of care ultrasound is a new avenue in internal medicine, promising to improve patient care exponentially, at the same time, minimizing exposure to excessive radiation. I am the lead in developing point of care ultrasound program at my institution and actively provide training to other medicine providers in bedside ultrasound.

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