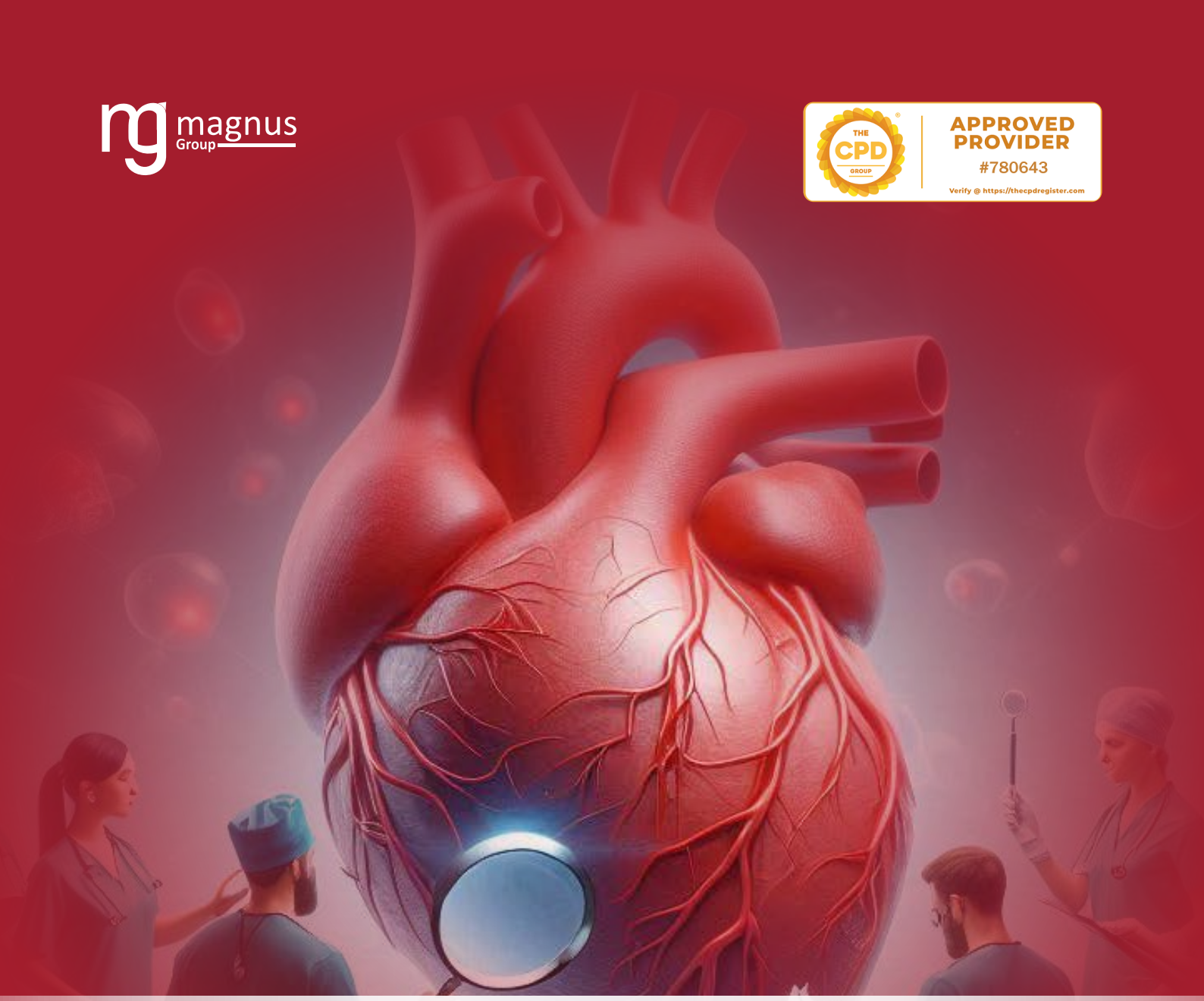
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2nd Edition of International Heart Congress

20-22 JUNE 2024 | Paris, France

Venue: Hotel CIS Paris Ravel, 6 Av. Maurice Ravel, 75012, Paris, France

BOOK OF ABSTRACTS

JUNE

20-22

2nd Edition of

International Heart Congress



BOOK OF ABSTRACTS

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Indiana University School of Medicine, United States



Dipak P Ramji
Cardiff University, United Kingdom



John R Doty
Intermountain Medical Center, United States



Mekhman N Mamedov
National Research Center for Preventive Medicine, Russia



Michael E. Merhige
State University of NY at Buffalo, United States



Miroslav Radenkovic
University of Belgrade, Serbia



Naranjan S Dhalla
St. Boniface Hospital Albrechtsen Research Centre, Canada



Roger H Coletti
Interventional Health, United States



Sergey Suchkov
The Russian University for Medicine & The Russian Academy of Natural Sciences, Russia



Syed Raza
Awali Hospital, Bahrain



Thomas J Webster
Hebei University of Technology, China



Yong Xiao Wang
Albany Medical Center, United States

Thank You All...

Speakers



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Tunisian Center for Nuclear Sciences and Technology, Tunisia



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Brookdale Hospital Medical Center -OBH, United States



Ayisha Zaka Bashir
University of Nebraska Medical Center, United States



Blake I Gardner
Intermountain Health, United States



Catherine Le
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Corey Tabit
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T Rajini Samuel
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Yadi Liu
Beijing University of Chinese Medicine, China



Yasser Mohammed Hassanain Elsayed
Egyptian Ministry of Health, Egypt



Zhongchen Li
Fuwai Hospital, China



Zuowei Pei
Central Hospital of Dalian University of Technology, China

Thank You All...

Welcome Message



Michael E. Merhige

State University of NY at Buffalo, United States

Welcome to Spring in Paris!

We are gathering for the Second International Heart Conference organized by the Magnus Group, initially held last year in Tokyo.

You will enjoy and be educated by incisive talks on coronary heart disease, heart failure and dysrhythmia over three days in the heart of France, presented by an inspired group of international speakers.

Your experience will include both up to date reviews in how to understand and manage routine heart disease problems in everyday clinical practice, as well as being informed about the current efforts in research to provide better outcomes and lower cost for our patients with heart disease.

In short, you will have a wonderful time here with us, while learning from an ecletic group of experts who bring different opinions toward the management of heart disease based on their own clinical experience from around the world. This approach provides you with an opportunity to easily ask questions pertinent to your own problems in providing cardiac care in your own venue. The faculty is primed to discuss your questions in detail.

Thanks for coming and enjoy Paris!

Welcome Message



Naranjan S Dhalla

St. Boniface Hospital Albrechtsen Research Centre, Canada

In my capacity as a Member of the Scientific Committee of Heart Congress 2024 to be held in Paris, France during June 20-22, 2024, I am most pleased to invite you to participate in this Cardiology meeting, which will feature several sessions and invited lectures on the pathophysiology and pharmacotherapy of heart disease. Particularly, this conference will focus on new developments in the area of ischemic heart disease, heart failure, cardiac remodeling, arrhythmias, cardiomyopathies and metabolic syndrome. This conference will be of great value to Interns, Residents and Fellows of Cardiology as well as cardiovascular scientists, academic cardiologists and practicing physicians. It will be a learning experience regarding the role of translational medicine in improving the therapy of cardiovascular disease.

Welcome Message



Roger H Coletti

Interventional Health, United States

Dear congress visitor, it is an honor and a pleasure to write a few welcome notes. Disturbance of microcirculation in the musculoskeletal system is a prime cause of pain and injury. It has been shown that chronic muscle spasm impedes skeletal muscle microcirculation and results in loss of mitochondria and muscle fibers. It has been further shown that resolution of the chronic muscle spasm allows the muscle to regenerate mitochondria and muscle fibers. Disturbances of microcirculation appear to also play a role in the development of tendinopathy. The microcirculation of tendons is easily impaired by chronic tension cause by chronic spasm of the attached muscles. I will share with you the findings of my clinical research over the past 15 years and the theories that developed to explain those findings.

Welcome Message



Yong Xiao Wang

Albany Medical Center, United States

As the Congress Organizing Committee Member and Keynote Speaker, I am very honored and pleased to write these welcome notes.

The current congress, Heart Congress 2024, aims to address the global challenge posed by cardiovascular disease, a leading cause of approximately 15 million annual fatalities worldwide.

Clearly, the upcoming Heart Congress 2024 will bring together leading researchers, scientists, clinicians, and industry professionals from cardiovascular health and disease fields around the world. The congress will include outstanding keynote sessions, plenary lectures, invited speeches, research presentations, technical demonstrations, and panel discussions around the world.

All the planned latest cutting-edge presentations and demonstrations will highlight the recent past, current, and future cardiology research, explore innovative technologies in heart disease treatment, and shed light on advancements in managing cardiovascular diseases. Furthermore, these presentations and demonstration will also energize innovative developments and discoveries to unveil breakthroughs and shape future various objectives.

I am very excited to look forward to meeting with you at this upcoming fantastic congress.

Welcome Message



Thomas J Webster

Hebei University of Technology, China

I am delighted to welcome you to the International Heart Congress. Clearly, the heart is one of the most important organs in our body. However, it is also one of the most problematic organs in the body. According to the World Health Organization, cardiovascular diseases (CVDs) are the leading cause of death globally with an estimated 17.9 million people who died from CVDs in 2019. Of course, with COVID following shortly thereafter, such statistics (including a drop in global life expectancy) have only become worse. Alarmingly, CVDs represent 32% of all global deaths. If our efforts over the last century have helped prevent, diagnose, and treat CVDs (which I think they have), why are so many people still dying from CVDs? Are our approaches focused correctly? At the right people? At the right communities? Let me give you my thoughts.

While it is true that many traditional societal conferences have been devoted to CVDs, this congress is different. This International Heart Congress has contributions from all over the world, fit for all over the world. I personally am always disappointed to see the same presentations from the same people at well-established societies or conferences – it is truly the "all boys network", usually from wealthy countries receiving grants from funding agencies that prohibit reaching a truly global population. While such research is important, such talks are usually not focused on CVD solutions that can benefit the entire world. Did you know that, as true with other diseases, those from under-developed countries suffer CVDs the most accounting for over 75% of the total CVD deaths globally? We have to transition our thinking to helping everyone, not just the country we are from – only then will we see global decreases in CVD. We need to ask ourselves the following questions: Does our research address CVD healthcare to those with limited sources? Geographical restrictions? No healthcare at all? How can we be solving CVDs without reaching the patients that need them most? What can you do? This is why I personally have committed to this fight and established a new research fund for Nigeria and other African countries to explore the best healthcare options for CVDs.

These and other new ground-breaking issues in global CVDs will be discussed at this International Heart Congress. Join me in developing new strategies to prevent, diagnose, and treat CVDs for everyone. Set your goal that can help once and for all make CVDs a statistic from the past, not the present, and certainly not the future. Set your goal to reduce CVDs where 75% of all CVDs occur, only then, can we see a change in CVD statistics.

Let's get going,

Welcome Message



Miroslav Radenkovic

University of Belgrade, Serbia

Dear congress visitors, it is an honor and pleasure to write a few welcome notes in regard to the forthcoming"2nd Edition of International Heart Congress". Clinically acceptable and cost-effective patient care represents an ultimate goal of the state-of-the-art cardiology investigations, further supported by innovative technologies and fast approaching artificial intelligence. Treating heart failure and related cardiovascular diseases are excellent starting points to gather distinguished scientists and healthcare professionals to discuss groundbreaking advancements, as well as clinical challenges, in order to find some evidence-based and novel directions to improve our knowledge in this field. This event will without any doubt foster further cooperation and sharing new results.

Welcome Message



Dipak P Ramji

Cardiff University, United Kingdom

On behalf of the Scientific Committee, I take great pleasure in welcoming you to the 2nd Edition of International Heart Congress here in beautiful Paris. The theme of this hybrid conference is "HEART: Holistic Efforts in Advancing Research and Treatment for Cardiovascular Well-being", and will focus on recent developments in research on cardiovascular disease, preventative and therapeutic avenues relating to atherosclerotic cardiovascular disease, heart failure, pediatric cardiology and other disorders, innovative technologies and new approaches in the field and many more. I sincerely hope that you take the opportunity to network, learn, share and collaborate with international experts whilst you are attending the conference. All of us on the Scientific Committee would take great pleasure in meeting you in person or virtually and in learning more about your amazing research. I wish you an enjoyable and productive conference. I hope you enjoy your stay in this wonderful city and use pre- and post-conference times to enjoy the sites. Enjoy the conference!

Welcome Message

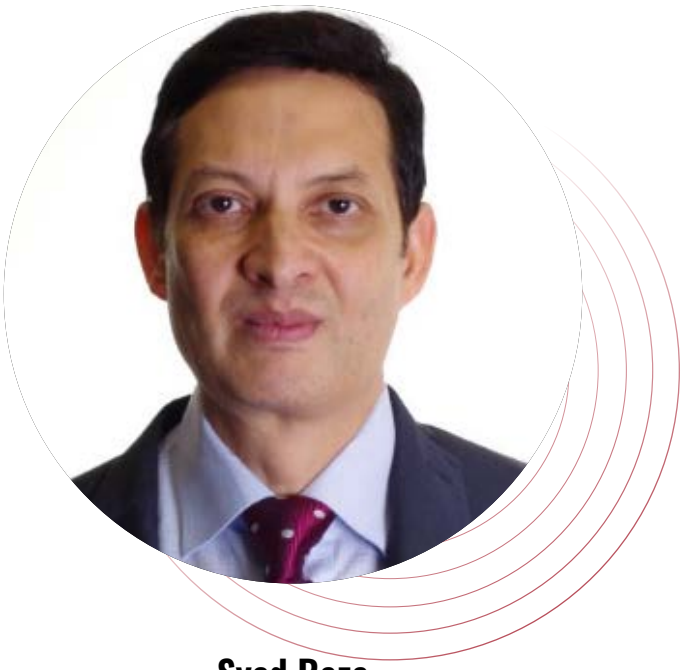


Mekhman N Mamedov

National Research Center for Preventive Medicine, Russia

Dear colleagues and congress visitors. Let me welcome you. The Congress has an important mission, presenting the latest advances in cardiology and expert opinions. The scientific program includes reports from around the world, which gives international status to this scientific event. The exchange of experience and education of practicing doctors is the advantage of this congress. The hybrid mode allows specialists from different parts of the world to participate. I wish success to the organizers and participants of Heart Congress 2024.

Welcome Message



Syed Raza

Awali Hospital, Bahrain

As a member of the Scientific committee, it is my utmost pleasure to welcome you all to HEART CONGRESS 2024. This is a three days hybrid event happening on 20th-22nd June 2024. The live event will take place in the beautiful city of Paris, France but you also have the opportunity to attend virtually if you are unable to make it physically. This scientific feast is going to witness high calibre keynote speakers and experts from different parts of the world who will present and discuss a wide range of key topics in cardiovascular Medicine. There will be ample discussion on latest guidelines, innovations and research in Cardiology which will be so beneficial to enrich your knowledge and skills in this rapidly changing field of Medicine.



ABOUT
MAGNUS GROUP

Magnus Group, a distinguished scientific event organizer, has been at the forefront of fostering knowledge exchange and collaboration since its inception in 2015. With a steadfast commitment to the ethos of "Share, receive, grow," Magnus Group has successfully organized over 200 conferences spanning diverse fields, including Healthcare, Medical, Pharmaceutics, Chemistry, Nursing, Agriculture, and Plant Sciences.

The core philosophy of Magnus Group revolves around creating dynamic platforms that facilitate the exchange of cutting-edge research, insights, and innovations within the global scientific community. By bringing together experts, scholars, and professionals from various disciplines, Magnus Group cultivates an environment conducive to intellectual discourse, networking, and interdisciplinary collaboration.

Magnus Group's unwavering dedication to organizing impactful scientific events has positioned it as a key player in the global scientific community. By adhering to the motto of "Share, receive, grow," Magnus Group continues to contribute significantly to the advancement of knowledge and the development of innovative solutions in various scientific domains.



ABOUT
Heart Congress 2024

Embark on an enlightening journey into cardiovascular health at the "**2nd Edition of International Heart Congress,**" during **June 20-22, 2024**. This distinguished event will be held in a Hybrid Format, offering the opportunity to engage with the vibrant ambiance of **Paris, France**, or to seamlessly **connect virtually** from the comfort of your home or workplace. Under the theme "*HEART: Holistic Efforts in Advancing Research and Treatment for Cardiovascular Well-being,*", this event promises to be a transformative experience, spotlighting the latest advancements in cardiology research, innovative technologies in heart failure treatment, and cutting-edge strategies for managing cardiovascular diseases.

Heart Congress 2024 is designed to foster a dynamic exchange of insights among esteemed academicians, scientists, healthcare professionals, and cardiologists from around the world. Participants will have the unique opportunity to share their latest research findings, engage in meaningful discussions on critical topics such as heart disease treatment, cardio medicine, pediatric cardiology, heart failure, and electrocardiography, and gain valuable perspectives from diverse corners of the globe. This annual collaboration not only brings together members of the organizing committee and prominent personalities in the field of cardiology but also serves as a platform for discovering the knowledge and innovations that are shaping the future of cardiovascular health. Join us in this pivotal event to accelerate breakthroughs in science, trials, and innovations within the realm of cardiology.



ABOUT
CPD Accreditation

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Continuing Professional Development (CPD) credits are valuable for Heart Congress 2024 attendees as they provide recognition and validation of their ongoing learning and professional development. The number of CPD credits that can be earned is typically based on the number of sessions attended. You have an opportunity to avail 1 *CPD credit for each hour of Attendance*. Some benefits of CPD credits include:

Career advancement: CPD credits demonstrate a commitment to ongoing learning and professional development, which can enhance one's reputation and increase chances of career advancement.

Maintenance of professional credentials: Many professions require a minimum number of CPD credits to maintain their certification or license.

Increased knowledge: Attending Heart Congress 2024 and earning CPD credits can help attendees stay current with the latest developments and

advancements in their field.

Networking opportunities: Cardiology Conference provide opportunities for attendees to network with peers and experts, expanding their professional network and building relationships with potential collaborators.

Note: Each conference attendee will receive 22 CPD credits.

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JUNE

20-22

2nd Edition of

International Heart Congress



KEYNOTE PRESENTATIONS

Metabolic dysfunction spilling over to the heart

Metabolic Dysfunction and Metabolic Syndrome birthed with visceral adiposity, and Insulin resistance has wide spread implications. From a bed of inflammation at the visceral adipose tissue core, RAAS activation and constricted vascular micro-perfusion. To hyperinsulinemia and volume expansion. Eventually, Insulin resistance at the brain level promoting compromised satiety, and yet a continuum of sympathetic stimulation at the brain level. Hypertension is an offspring of that, aggravated by a spiral of weight gain.

Eventually, visceral adipocytes in defiance to insulin as resistance increases rebel with lipolysis, and showering the vascular endothelium, liver and myocardium with free fatty acids, toxic and arrhythmogenic. The background is already set with a longer QT interval triggered by Insulin resistance and hyperinsulinemia.

The lipo-toxicity sets beta cells islets on fire, compromise their capacity and prediabetes or diabetes result. Livers are pushed to steatosis & MASLD. Endothelial cells to a dysfunctional status with No Nitric Oxide, i.e.No No. Eventually cardiac steatosis, diastolic dysfunction, atherosclerosis and coronary endothelial compromise with first microcirculatory failure and HFpEF. Later in the course of the problem coronary atherosclerosis and HFrEF.

Interventions to break the cycle can be critical in reversing this evil spiral. This explains why unexpectedly therapies directed at reversing insulin resistance, visceral adiposity reduced MACE, cardiac death, and all cause mortality. Something we did not encounter with sulphonyl -urea drugs nor insulin therapy apart from saving lives preventing ketoacidosis in insulin deficiency but not in insulin resistance which is much bigger problem and a wide spread pandemic. Supportive cardiovascular outcomes from GLP1RA, $SGLT_2$ inhibitors, $SGLT_1/T_2$ inhibitors, GLP1RA/GIP RA, and the future Dutides and Trutides.

Audience Take Away Notes

- Mechanisms of cardiac compromise in the midst of the metabolic dysfunctional entangle -how to use therapies that work synergistically to protect the cardiac performance while improving insulin resistance and reducing hyperinsulinemia
- How to avoid seemingly useful single directed therapies that may seem to help one area while compromising another angle of the metabolic dysfunction, e.g. Thiazide diuretics



Ahdy Wadie Helmy

Indiana University School of Medicine, Indiana, Indianapolis, United States

Biography

Dr. Helmy graduated from Alexandria University School of Medicine, did his first residency in Internal Medicine. Earned his Master Degree then PhD. Moved to the USA, did another Internal Medicine Residency at Indiana University, then a fellowship in Endocrinology & Metabolism at Indiana University. Became board certified in Internal Medicine, then Endocrinology, and had his 3rd board in Clinical Lipidology. Championed the establishment of the first advanced lipid testing and lipid clinic at The VA Medical Center at Indianapolis which is a part of Indiana University Medical center. He is an author, a clinician and a prolific teacher who earned numerous teaching award. A national and international speaker in multiple endocrinology topics mostly lipids, Metabolic Syndrome, Diabetes, and testosterone replacement.

How do nutraceuticals protect against heart disease?

Atherosclerosclerotic Cardiovascular Disease (ACVD) is responsible for a third of all global deaths. Although a reduction in morbidity and mortality from ACVD has been achieved recently by lifestyle changes and pharmaceutical intervention, this is expected to reverse in the future because of global increase in risk factors such as hypercholesterolemia, obesity and diabetes. Current pharmaceutical therapies against ACVD are associated with substantial residual risk for the disease together with other issues such as side effects. In addition, pharmaceutical agents against many promising targets have proved disappointing in clinical trials. It is therefore essential that the molecular basis of ACVD is fully understood, and new therapeutic/preventative agents or targets are identified and validated.

The major focus of recent research in my laboratory is to understand the molecular mechanisms underlying the protective actions of natural products in ACVD using a combination of in vitro and in vivo model systems together with biochemical, molecular biology, pharmacological and immunological approaches. Our research has provided novel insights into the mechanisms underlying the protective actions of several nutraceuticals, including fatty acids, polyphenols and probiotic bacteria. In addition to the beneficial effects on ACVD, our studies have revealed protective actions against other inflammatory disorders, particularly non-alcoholic fatty liver disease. Our findings on the mechanisms underlying the beneficial actions of key nutraceuticals will be presented.

Audience Take Away Notes

- The audience will learn about how nutraceuticals can prevent and treat heart disease
- The research-led knowledge base will positively impact their jobs
- The research could be used by other faculty to expand their research or teaching
- The research could impact therapeutic options available in heart disease
- The research could lead to development of new agents to prevent and treat heart disease



Dipak P. Ramji

Cardiff School of Biosciences, Cardiff University, Cardiff CF10 3AX, United Kingdom

Biography

Dipak Ramji is Professor of Cardiovascular Science and Deputy Head of the School of Biosciences at Cardiff University. He is also Fellow of the Learned Society of Wales. He received his BSc (Hons) degree (Biochemistry) and his PhD (Molecular Biology) from the University of Leeds. This was followed by post-doctoral research at EMBL (Heidelberg) and IRBM (Rome) with fellowships from the Royal Society and the EU. His current research is focused on understanding how natural products regulate cellular processes in heart disease and other inflammatory disorders with the goal of attaining deeper mechanistic insight and identifying preventative/therapeutic agents. He has published over 150 research articles (h index 43 and i10 index 79 with over 9,140 citations), including 880-page book in 2022 on Methods in Atherosclerosis. He is an Editorial Board member of many international journals, member of the British Heart Foundation Project Grants Committee, external examiner of taught programmes at three universities and has supervised 27 PhD students to completion.

Aortic root replacement

Aortic root replacement is an operation that requires resection of diseased aortic sinus tissue. Patients requiring aortic root replacement include those with combined aortic valve degeneration and aortic pathology, such as bicuspid aortic stenosis and root aneurysm. Other indications include aortic dissection involving the aortic root and valve, endocarditis with destruction of both leaflets and the aortic annulus, or congenitally small left ventricular outflow tract where root replacement can simultaneously enlarge the aortic root and allow for implantation of an adequately sized prosthesis.

Depending on the specific patient pathology, the operation typically entails removal of aortic sinus tissue, resection or preservation of the aortic valve leaflets, and reimplantation of the coronary arteries. While more complicated that standard aortic valve replacement, these operations address both leaflet and aortic root pathology at the same time. When performed at experienced centers, aortic root replacement is a safe and effective operation for patients with concomitant aortic valve pathology and aortic root disease.

Surgical options include stented and stentless bioprosthetic valved conduits, mechanical conduit, cryopreserved aortic homograft, pulmonary autograft, and valve-sparing root replacement. Each of these operations have unique features for reconstruction of the aortic root and particular advantages for specific patients. Proper prosthesis selection is necessary for each patient, particularly in the very young and very elderly populations. Outcomes after the various operations are generally good with durable long-term results. However, each prosthesis has associated potential long-term consequences requiring ongoing surveillance and management. Knowledge of the various options is essential to helping patients understand their potential options and care after surgery.

Audience Take Away Notes

- Attendees will learn relevant aortic root anatomy
- Review of indications for aortic root replacement
- Description of various operative techniques
- Discussion of outcomes after surgery for aortic root disease



John R. Doty

Division of Cardiac Surgery, Intermountain Medical Center, Salt Lake City, UT, United States

Biography

Collaboration Interests: Open and Endovascular Treatment of Aortic Aneurysm and Dissection, Surgical Treatment of Atrial Fibrillation, Marfan Syndrome, and Adult Congenital Heart Disease. Research: My research and clinical activities over the past several years have focused on aortic root replacement, aortic disease, and adult congenital heart disease. I also have ongoing projects in resident education and in less invasive therapies for atrial fibrillation. Positions/ Roles: Cardiovascular and Thoracic Surgeon, Intermountain Health (2003-present). Associate Medical Director of Cardiovascular and Thoracic Surgery, Intermountain Health (2015-presemt). Education and Training: Doctor of Medicine from Georgetown University. Residency in General Surgery at the Johns Hopkins Hospital. Fellowship in Thoracic Surgery at the Johns Hopkins Hospital.

Updated recommendations for the management of patients with diabetes mellitus and cardiovascular diseases

WHO considers Diabetes Mellitus (DM) to be a pandemic that has spread throughout the world. In some countries, this epidemic reaches >8% of the adult population, and in 20 years the frequency is expected to increase to 30-50%. Prospective studies have demonstrated that patients with diabetes are at high risk of developing Cardiovascular Diseases (CVD), including Coronary Artery Disease (CHD), Heart Failure (HF), Atrial Fibrillation (AF), stroke and peripheral arteries. In 2023, the european society of cardiology presented updated recommendations for the management of CVD in patients with diabetes. The new recommendations, unlike a similar document for 2019, do not consider prediabetes. The 10-year risk of fatal and non-fatal CVD (myocardial infarction and stroke) is assessed using a new special scale (SCORE2-Diabetes) for patients with diabetes without CVD or severe end-organ damage. In other words, the SCORE2-Diabetes score serves as a guide for clinical decision making in patients with type 2 diabetes with 4 risk levels: low, moderate, high or very high risk. Given the high prevalence of previously undiagnosed diabetes in patients with CVD and the increased risk of complications, experts recommend systematic screening for diabetes in all persons with CVD. Data from large studies indicate the need to prescribe Glucagon-Like Peptide-1 receptor (GLP-1) agonists receptor and/or Sodium-Glucose Co-Transporter Type 2 (SGLT2) inhibitors in patients with diabetes and CVD in order to reduce the risk of complications as part of complex therapy. Moreover, this therapy can be prescribed regardless of the initial or target HbA1c level and regardless of the concomitant use of glucose-lowering drugs. When using low-dose aspirin and a combination of antithrombotic drugs, the use of proton pump inhibitors should be considered to prevent gastrointestinal bleeding. The risk of bleeding must be considered on an individual basis. A multifactorial approach is the basis of management in patients with diabetes and CVD. Given the high risk of complications, screening for AF should be performed routinely, especially among people over 65 years of age. In patients with diabetes and CKD, it is recommended to treat with an SGLT2 inhibitor and/or finerenone, since these agents reduce CV and kidney failure risk on top of standard of care.

In general, experts are of the opinion that the management of patients with diabetes and CVD requires a multidisciplinary approach involving doctors from different specialties. Shared decision making and implementation of individualized treatment strategies can reduce the burden of disease for each patient. The main goal of managing CVD in patients with diabetes is to improve the prognosis and quality of life.



Mamedov M. N

National Research Center for Preventive Medicine, Russian Federation

Biography

Professor Mehman Mamedov graduated from the Moscow Medical Academy named after I.M. Sechenov in 1993. He continued his medical residency at the Central Clinical Hospital of the Presidential Administration of the Russian Federation. Some 20 years ago, Mekhman N Mamedov made his first trip out of Russia. He had just received his PhD degree and was looking to develop his scientific interests, contacts and networking, by travelling abroad for oral and poster presentations. Today, he is Professor of Cardiology, Head of the Laboratory for Assessment of and Correction of Cardiovascular Risk in the National Research Center for Preventive Medicine in Moscow and Vice President of the Cardioprogress Foundation. He is also a leading expert of the Russian League of Nation's Health. In his current role, his scientific and research interests cover epidemiology of CVDs and risk factors, lipid metabolism disorders, prediabetes, diabetes and CVDs, men's health in cardiology, early markers of atherosclerosis, and telemedicine. Professor Mehman Mamedov graduated from the Moscow Medical Academy named after I.M. Sechenov in 1993. He continued his medical residency

at the Central Clinical Hospital of the Presidential Administration of the Russian Federation. In 1997 Dr. Mamedov received his PhD degree in the National Research Center for Preventive Medicine of the Ministry of Healthcare of the Russian Federation for research titled "Metabolic syndrome components in patients with arterial hypertension". In 2001 he wrote his doctoral thesis on "Clinical and biochemical features of metabolic syndrome and its pharmacological management". He has been working in the National Medical Research Center for Therapy and Preventive Medicine for 26 years, beginning as a researcher and eventually becoming the head of the scientific laboratory. He has letters of appreciation from the head of the Republic of Ingushetia, ministers of health of the Russian Federation, Uzbekistan, Tajikistan, Belarus, the Chechen Republic and the presidents of the Turkish Society of Cardiology, the Association of Internists of Kazakhstan and the National Health League. In 2019, he was awarded with V.D. Shervinsky medal by the President of the Russian Scientific Medical Society of Internal Medicine for his contribution to the development of medical science.

Managing total chronic coronary occlusion: Noninvasive External Counterpulsation (ECP) induces collaterogenesis, relieving ischemia, as demonstrated by quantitative PET myocardial perfusion imaging: ECP is a cost-effective alternative to high risk PCI

Background: External Counter Pulsation (ECP) is an FDA approved, noninvasive, treatment for patients with refractory angina, who are not candidates for low-risk interventional revascularization, such as those with Chronic Total Coronary Occlusion (CTO). ECP uses sequentially inflated blood pressure cuffs: from legs, thighs to hips, gated to the ECG, acting similarly to an intra-aortic balloon pump from which it was derived, augmenting diastolic pressure and coronary flow, while creating shear forces across coronary endothelium. This augmented coronary flow mimics the shear forces that develop due to the pressure gradient between the donor and recipient artery in CTO, stimulating gene activation and production of cytokines and growth factors leading to new cell growth, and increased bulk coronary flow capacity into the ischemic bed, through enlargement of coronary collateral vessels which were established during embryogenesis.

The amount of collateral flow around a CTO has been measured invasively as the Collateral Flow Index (CFI) which is quantified as the coronary wedge pressure in the recipient artery. When compared to "sham" ECP where cuffs were inflated to only diastolic pressure (e.g., 80mmHg), therapeutic ECP (cuffs inflated in diastole to 300mmHg), CFI improved significantly, indicating successful collateral development, potentially relieving ischemia.

Hypothesis: Coronary Collateral Flow Capacity (CCFC) can be measured noninvasively using quantitative PET myocardial perfusion imaging, by comparing stress perfusion in the post-stenotic bed during vasodilator stress, which reduces supply side pressure revealing coronary steal through collaterals, compared with demand ischemia, using dobutamine, which maintains supply side pressure through the collateral bed.

Methods: Twelve sequential patients with CTO had the standard FDA approved protocol of 35 one-hour sessions of ECP, undergoing quantitative PET imaging with Rubidum-82 at rest, with vasodilator stress (DIP) before ECP, and Dobutamine / Atropine (DBT) PET after ECP.

Absolute coronary blood flow was calculated per pixel and displayed as homolosine projections depicting each quadrant of the left ventricle: at rest, peak hyperemia, and as Coronary Flow Reserve (CFR). A fourth set of parametric images was derived by plotting peak stress perfusion against the CFR, to produce Coronary Flow Capacity images (CFC) which were divided into five, clinically relevant "band-widths" ranging from values in normal young volunteers, to those during vasodilator stress induced ischemia, using HeartSee software.



Michael E. Merhige

State University of NY at Buffalo, United States

Biography

Michael E. Merhige MD is a Clinical Associate Professor of Nuclear Medicine at the State University of New York at Buffalo and Chief Executive Officer at Michael E. Merhige MD, Coronary Disease Prevention and Reversal. He has been performing cardiac PET since 1986. He is a Fellow of the American Cardiology and American Society of Nuclear Cardiology, presently in outpatient Cardiology practice, focusing on coronary disease prevention and reversal, using quantitative PETMPI to guide coronary revascularization decisions. After his BA degree in Biology at the University of Rochester in New York in 1973, he completed the MS in Cell Biology at the University of Kentucky with his thesis: "The Manduca Sexta labial gland: A terminally differentiated insect cell system". He graduated with honors at UK College of Medicine in 1980, completed internal medicine residency at Mayo Clinic, Rochester, Minnesota, and then cardiology fellowship at the University of Texas Health Science Center-Houston in Texas, followed by an NIH research fellowship under K. Lance Gould MD, before joining the full time academic faculty there. In 1989 he transitioned to private practice, moving to Buffalo New York as Chief of Nuclear Cardiology

Results: Percent LV mass with ischemic CFC fell for all patients treated with ECP, revealing collateral flow capacity, when DIP stress was compared with DBT (28.1% vs 3.8% p = 0.001). One patient demonstrated minimal improvement in CFC despite ECP therapy: subsequent coronary arteriography revealed a new stenosis in the supply side vessel, which was stented.

All 12 ECP treated patients improved minimal and lowest quadrant mean perfusion: DIP vs. DBT = 0.6 vs 1.2 ml/mn/g, p = 0.001, and 1.1 v 2 ml/mn/g, p < 0.001, demonstrating improved absolute perfusion into the ischemic zone with DBT compared with DIP stress, consistent with the presence of collateral vessel arteriogenesis into the ischemic CTO bed.

Conclusion: Successful coronary collaterogenesis can be identified and quantified noninvasively in patients with CTO using PET myocardial perfusion imaging.

at Buffalo Cardiology Associates, establishing one of the first out-patient cardiac PET centers in the US in 1995. After going into solo practice in 2000, he became Director of the Heart Center of Niagara in Niagara Falls, NY, providing cardiac PET studies 24/7/365 in the emergency department of Niagara Falls Memorial hospital. There death rates fell from 16 to 3% for chest pain patients in the ED following the introduction of cardiac PET. After the international recall of Rubidium-82 in 2011, he moved to his current outpatient cardiology practice driven by quantitative PET perfusion imaging and coronary flow capacity to guide revascularization decisions. His current research interests include noninvasive coronary revascularization in patients with chronic total coronary occlusion using external counterpulsation, to be presented at this Second International Heart Conference.

Clinical pharmacology of sotagliflozin – novel quality in treatment of heart failure

Heart failure is a serious clinical syndrome with symptoms and signs provoked by a structural and functional cardiac abnormality, and coupled with elevated natriuretic peptide levels and evident pulmonary or systemic congestion. Regardless of outstanding improvements in the management of heart failure over the past period, its prognosis is still poor with notable rates of mortality and hospitalization due to worsening of overall clinical presentation. Sodium-Glucose Cotransporter-2 ($SGLT_2$) inhibitors are relatively novel glucose-lowering drugs that furthermore promote weight loss and the reduction of blood pressure. Moreover, the data from ground-breaking trials clearly demonstrated that the beneficial effects of $SGLT_2$ inhibitors extended to non-diabetic patients with chronic kidney disease and/or heart failure with reduced ejection fraction. Still, the risks vs. benefits in each patient should be carefully analyzed and weighed when making a prescribing decision due to known adverse drug reactions to $SGLT_2$ inhibitors. Sotagliflozin is a recently registered $SGLT_2$ inhibitor prescribed to reduce the risk of cardiovascular death, hospitalization for heart failure, and urgent heart failure in adults with heart failure or type 2 diabetes mellitus, chronic kidney disease, and other cardiovascular risk factors. Given the previous facts, the main objectives of this presentation will be to clarify the pharmacological features of sotagliflozin, including pharmacodynamics, pharmacokinetics, indications, and contraindications for use, adverse drug reactions, as well as the most important drug interactions. This will provide a better understanding of this new-in-pharmacotherapy drug for heart failure, consequently helping clinicians in its suitable prescribing and adequate clinical use.



Miroslav Radenkovic

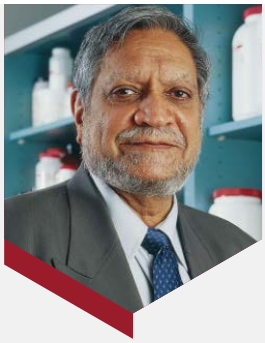
Department or Pharmacology, Clinical Pharmacology and Toxicology; Faculty of Medicine; University of Belgrade; Belgrade; Serbia

Biography

Miroslav Radenkovic, MD, MS, PhD, a full-time professor at the Department of Pharmacology, Clinical Pharmacology and Toxicology, graduated from the Faculty of Medicine – University of Belgrade (FMUB) in 1995, and from 1996 he is working at the FMUB. He received an MS from pharmacology, board certified in Clinical Pharmacology, PhD from Medical Sciences, and a sub-specialization degree in Clinical Pharmacology - Pharmacotherapy in 1999, 2000, 2004, and 2016 respectively, from the FMUB, as well as Bioethics MS in 2021 from the Clarkson University, NYC, USA. From 2002 Dr. Radenkovic officially participated in several scientific projects supported by the Ministry of Science – Serbia; the Austrian Science Fund; COST Action; as well as the NIH Fogarty International Center Project, USA. Dr. Radenkovic is a member of the Ethics Committee of Serbia.

Rationale for the prevention or therapy of sudden cardiac death in heart failure

Although sudden cardiac death is considered to be a major mode of death in patients with heart failure, no satisfactory medical therapy is available for its prevention. Since over activation of sympathetic nervous system is invariably seen in subjects with high risk for sudden cardiac death, elevated levels of circulating catecholamine levels are considered to result in lethal ventricular arrhythmias and subsequent sudden cardiac death. However, experimental evidence from our laboratory has revealed that excessive amounts of circulating catecholamines are oxidized to aminochromes, which are highly reactive quinine compounds, in addition to producing oxidative stress. A marked increase in plasma adrenochrome level was seen in heart failure; patients with higher than mean value for adrenochrome showed greater mortality. An antiplatelet agent, sulfinpyrazone, was observed to depress the adrenochrome- induced incidence of arrhythmias as well as mortality of animals. The oxidation products of catecholamines (both adrenochrome and oxidative stress) have been demonstrated to produce subcellular alterations, intracellular Ca2+- overload, coronary spasm, myocardial cell damage, depletion of high energy stores and ventricular arrhythmias. Furthermore, catecholamine-induced arrhythmias and ventricular fibrillation were associated with elevated levels of plasma adrenochromes and these changes were markedly attenuated by treatment of animals with different antioxidants. The results suggest that oxidation of catecholamines under stressful conditions may play a critical role in the genesis of fatal ventricular arrhythmias. Accordingly, antioxidant therapy in heart failure may be helpful in preventing sudden cardiac death.



Naranjan S. Dhalla

Institute of Cardiovascular Sciences, St. Boniface General Hospital Research Centre, and Department of Physiology and Pathophysiology, Max Rady College of Medicine, University of Manitoba, Winnipeg, Canada R2H 2A6

Biography

Naranjan S. Dhalla is a Distinguished Professor at the University of Manitoba and was the founding Director of the Institute of Cardiovascular Sciences and served for 19 years. He is currently serving as Executive Director of the International Academy of Cardiovascular Sciences and has been elected its Honorary Life President. He served for 36 years as Editor-in-Chief of a major medical journal, Molecular and Cellular Biochemistry. He was both Secretary General and President of the International Society for Heart Research for more than 25 years. His research in the field of cardiovascular pathophysiology over the years has had a major impact on the understanding of heart disease and its treatment. He has published more than 875 full length papers and reviews, and has edited or authored over 68 books. Dr. Dhalla has received 216 honours and awards including Fellowship of the Royal Society of Canada, Membership of the Order of Canada and Order of Manitoba, Honorary Degrees and Professorships from 12 Universities, Medal of Honour of the Canadian Medical Association and Research Achievement Award of the Canadian Cardiovascular Society, and has been inducted in the Citizen Hall of Fame in Winnipeg as well as Canadian Medical Hall of Fame.

Effects of impaired microcirculation in the musculoskeletal system

Through out the body blood flow is regulated by vascular tone secondary to local or neurologic control. However, in the musculoskeletal system, the effects of muscular contraction can lead to augmentation of restriction of local blood flow. While repetitive muscle contraction increases local blood flow, sustained muscular contraction limits blood flow. It is known from cardiac physiology that coronary blood flow is predominant in diastole as systolic cardiac contraction compresses capillaries to limit blood flow. Research I performed during my cardiology fellowship demonstrated that progressive suppression of contractility with increasing doses of beta blockers will ultimately lead to a reversal of the systolic to diastolic blood flow such that the predominant flow is in systole. Unfortunately, I neglected to publish that finding at that time for unknown reasons. It can be readily understood from that and other work that the degree of muscle contraction determines the degree of blood flow suppression. I have previously presented arguments supporting the ischemic model of chronic muscle spasm. Ischemia is seen as the causative agent keeping the muscle in chronic spasm. The other side of that argument is that prolonged spasm leads to the ischemia completing the vicious cycle of ischemia maintaining chronic spasm. The prolonged ischemia leads to the development of marked spontaneous electrical activity or SEA seen on EMG evaluation that both identifies the muscle in chronic spam and is the causative agent to maintain the muscle in spasm.

Chronic muscle spasm is not the only site in the musculoskeletal system where impairment of microcirculation has untoward effect. Tendinopathy, formerly always identified as tendinitis, varies in its pathologic findings depending which part of the tendon is biopsied. As it turns out, inflammation is seen at some sites but more consistently is loss of fibers noted in some cases stated to represent hypoxic damage. I had postulated that tendonitis was the result of impairment of the microcirculation of the central aspects of the tendon secondary to the pull of an attached muscle in chronic spasm. Biopsy studies of the mid portion of the achilles tendon in cases of tendinopathy do not show inflammation but findings that would be consistent with ischemic damage. Clinically, treatment of chronic muscle spasm that had resulted in tendinopathy, has a distinct clinical course. Typically, it takes about three days after successful treatment of the chronic muscle spasm for relief of the tendinopathy. This would not be inconsistent with partial tendon recovery with the restitution of central tendon blood flow. Based upon this premise, the protocol for treatment of tendinopathy should initially be a search for an attached muscle in chronic spasm and treatment should begin with attempted resolution of that muscle spasm.



Roger H. Coletti

Interventional Health, PA Lewes, Delaware, United States

Biography

Roger Howard Coletti, MD, FACC, FASNC, FSCAI graduated from Georgetown University College of Arts and Sciences. He received a Master of Arts in Natural Sciences from Hofstra University. He did one year of bench research on drug metabolism at New York University Medical School. He earned his MD from State University of New York at Downstate. His medical internship and residency were performed at Nassau County Medical Center in East Meadow, NY. He completed two years of cardiology fellowship at Columbia Presbyterian Medical Center in New York and one year of Interventional Cardiology fellowship at Westchester County Medical Center.

As described above, the common thread of impaired microcirculation in the musculoskeletal system has broad implications for therapeutic intervention.

Audience Take Away Notes

- The audience will learn the pathophysiology of both chronic muscle spasm and tendinopathy
- Understanding the effects of impaired microcirculation in the musculoskeletal system should allow for the development of additional treatment protocols that can lead to more rapid and resilient outcomes
- Understanding the pathophysiology of chronic muscle spasm will allow the audience to use EMG guidance in identifying skeletal muscle in true chronic spasm
- Understanding the pathophysiology of tendinopathy will allow the audience to seek out attached muscles in chronic spasm to be treated and relieve the tendinopathy
- Presentation will also include a video presentation of a treatment protocol, CMECD, that the audience will be able to undertake and successfully treat chronic muscle spasm with resultant chronic pain with a single EMG guided injection
- The belated understanding of the etiology and identification of chronic muscle spasm and resultant pain should be a new starting point in the field of myology and pain management for future research and treatment options
- The treatment protocol, CMECD, is an entirely practical treatment option and can be undertaken by any medical practitioner that is authorized to give injections

Personalized and Precision Medicine (PPM) as a unique healthcare model to be set up through biodesign-inspired and biotech-driven translational applications and cardiology-related marketing to secure the human healthcare and biosafety

A new systems approach to diseased states and wellness result in a new branch in the healthcare services, namely, Personalized and Precision Medicine (PPM). To achieve the implementation of PPM concept, it is necessary to create a fundamentally new strategy based upon the recognition of biomarkers and thus the targets to secure the grand future of drug design and drug discovery. It would be extremely useful to integrate data harvesting from different databanks for applications such as prediction and personalization of further treatment to thus provide more tailored measures for the patients resulting in improved patient outcomes, reduced adverse events, and more cost effective use of the latest health care resources including diagnostic (companion ones), preventive and therapeutic (targeted molecular and cellular) etc. A major paradigm shift has become the increasing recognition of the potential therapeutic utility of the targeted drugs for cardiovascular diseases, whilst opening up new avenues of therapeutic implications. As PPM continues to drive targeted immunotherapy development and cardiac biomarker discovery for healthcare services, cardiologists could indeed see their own PPM-based renaissance very soon. In cardiovascular disease, PPM may result in much-needed innovation in the field and has the potential to eventually change the way we treat heart diseases altogether. And PPM and PPC are thus poised to become the next great revolution in the daily practice, as well as in the maintenance of cardiovascular health and the prevention and cure of cardiovascular disease. PPM disrupts standard practice and draws from clinical testing, electronic health records, pan-omics profiling, big datasets, and novel analytical methods, to create a person-specific phenotype that can then be used to identify an optimal intervention with minimal risk. Encompassing functional cardiology, integrative medicine, and metabolic medicine/cardiology, we would suggest an up-to-date, expert approach to heart health wellness and treating the diseased heart and blood vessels. The proposal would ideally be suited for practitioners who already incorporate integrative approaches in their practice, as well as more traditional clinicians who want to learn more about PPM and PPC as a growing area. In short, PPM will transform the way the physicians practice and will shake up the entire pharmaceutical value chain.



Sergey Suchkov[1-6]*, Matt Springer[13], Daniel Scherman[11], Shawn Murphy[8,9], Roger Kamm[10], David Smith[12], Hiroyuki Abe[5], R. Holland Cheng[14], Trevor Marshall[7]

[1]The Russian University of Medicine, Moscow, Russia

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[3]EPMA, Brussels, European

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[9]Harvard Medical School, Boston, MA, United States

[10]Biological Engineering department, MIT, Cambridge, MA, United States

[11]Faculty of Pharmacy, Universite Paris Descarte, Paris, France

[12]Mayo Clinic, Rochester, MN, United States

[13]Dept for Cardiology, UCSF, SF, CA, United States

[14]Dept of Molecular and Cellular Biology, College of Biological Sciences, University of California Davis, Davis, CA, United States

Audience Take Away Notes

- The upgraded philosophy of personalized and precision medicine as applicable to cardiology
- To define the approaches to applied in the daily practice to assess patients in an individualized style
- For sure, for the mode of lecture and lecture training courses
- In a stepwise manner
- Through the View of biodesign-inspired and biotech-driven translational research aiming at the targeted cardiology-related problem

Biography

Sergey Suchkov was born in the City of Astrakhan, Russia, in a family of dynasty medical doctors. In 1980, graduated from Astrakhan State Medical University and was awarded with MD. In 1985, Suchkov maintained his PhD as a PhD student of the I.M. Sechenov Moscow Medical Academy and Institute of Medical Enzymology. In 2001, Suchkov maintained his Doctor Degree at the National Institute of Immunology, Russia. From 1989 through 1995, Dr. Suchkov was being a Head of the Lab of Clinical Immunology, Helmholtz Eye Research Institute in Moscow. From 1995 through 2004 - a Chair of the Dept for Clinical Immunology, Moscow Clinical Research Institute (MONIKI). In 1993-1996, Dr. Suchkov was a Secretary-in-Chief of the Editorial Board, Biomedical Science, an international journal published jointly by the USSR Academy of Sciences and the Royal Society of Chemistry, UK. At present, Dr. Sergey Suchkov, MD, PhD, is: Professor and Chair of the Dept for Personalized Medicine, Precision Nutriciology & Biodesign of the Institute for Biotech & Global Health of Ros Biotech and Professor, Dept for Clinical Allergology & Immunology, A.I. Evdokimov Moscow State University for Medicine & Dentistry (MGMSU), Russia; Secretary General, United Cultural Convention (UCC), Cambridge, UK. Dr. Suchkov is a member of the: New York Academy of Sciences, USA. American Chemical Society (ACS), USA; American Heart Association (AHA), USA; European Association for Medical Education (AMEE), Dundee, UK; EPMA (European Association for Predictive, Preventive and Personalized Medicine), Brussels, EU; ARVO (American Association for Research in Vision and Ophthalmology); ISER (International Society for Eye Research); Personalized Medicine Coalition (PMC), Washington, DC, USA.

Precision medicine for a personalized care in dyslipidaemia

Dyslipidaemia comprises of abnormal lipid components and refers mainly to increased levels of LDL, non HDL particles and triglycerides while decreased levels of HDL dyslipidaemia is a common and independent modifiable risk factor for cardiovascular disease. Besides quantitative measurement, qualitative assessment of these components is also essential and therefore particles like lipoprotein (a) and Apo-B should be taken into account.

Unlike in the past where dyslipidaemia was treated mainly based on their quantitative levels, there is a paradigm shift in providing a more personalized care to patients. This is based on assessment of cardiovascular risk of individual patient which allows choosing the right strategy of therapy for them. This would include using the right intensity statin therapy in the correct dose for a category or level of cardiovascular risk. In addition, there is now more emphasis on making use of other lipid lowering drugs like ezetimibe, PCSK-9 inhibitor, fibrates and Omega 3 fatty acid. Adoption of these strategies are based on evidence derived from several well designed randomized control trials that have shown to lead to better cardiovascular outcome.

It is therefore vital that clinicians are aware of this concept of precision Medicine so that prescription for managing dyslipidaemia is more cost effective and lifesaving.



Syed Raza

Consultant Cardiologist &
Physician Awali Hospital, Bahrain

Biography

Dr. Syed Raza graduated from Aligarh University in India in 1993. After completing his postgraduate degree in Medicine from the same university, he moved to the UK for higher specialist studies. He successfully completed MRCP and CCT and later also awarded Fellow of the Royal College of Physicians of Edinburgh (FRCP). He was awarded Professor John Goodwin prize for outstanding performance in Diploma Cardiology exam at Hammersmith Hospital, University of London in 2001. Dr. Raza is Fellow of American College of Cardiology and American College of Chest Physicoans. He is also Fellow of European Society of Cardiology and Fellow of European Society of Cardiovascular Imaging. He is also on the committee of Acute Cardiovascular Care. Heart Failure and Cardiovascular Imaging (European Society of Cardiology). He is currently working as Consultant Cardiologist and Head of the department of Medicine at Awali Hospital, Bahrain. Dr. Raza is a board member of the Hospital Excecutive Committee. He also chairs the Resuscitation committee and Privileging and Credentialing Committee. Prior to this he worked as consultant in Cardiology at Mid Cheshire Hospitals, NHS trust, United Kingdom. He is the regional educational coordinator for RCP Edinburgh and examiner for MRCP exam for the Royal College of Physicians of UK. He has partipcpated in some well known trials and reasearch. He has to his credit numerous publications and he has presented his scietific work in different parts of the world. He is peer review author for some well respected International journals. He is permanent Review author for abstracts for European Society of Cardiology Annual Congress. He is on the editorial board of International Journal of Endovasculat Treatment and Innovative Techniques. Dr. Raza is a teaching faculty member for Healthcare Management and Leadership at Westford University, Dubai campus. He is certified American Board in Medical Quality. Dr. Raza frequently organises a number of seminars, webinars, symposia and workshop on various healthcare, quality and safety topics. Dr. Raza has led the first awareness campaign in Heart Failure in the Middle East in 2017. He is chairman of BAPCO's health promotion unit. His special interests are Cardiovascular Imaging, Heart Failure and Acute Cardiovascular Care. He is founder and chairman of Raza Foundations which works for educating and increasing awareness on various health related topics amongst the general public as well as provide free healthcare services to poor as one of the charity initiatives.

Cardio nanomedicine: Fighting plaque, opening arteries, and healing hearts

Nanomedicine has already provided dozens of FDA approved products improving the lives of billions. Most notably, nanomaterials have been used to develop vaccines for COVID, improved spinal implants, anti-infection materials without using antibiotics, and numerous drug delivery vehicles. However, the use of nanomedicine in the cardiovascular system has remained largely uninvestigated and uncommercialized. This invited talk will provide a summary of in vitro and in vivo experiments in cardio nanomedicine which have demonstrated decreased thrombus formation on nanotextured vascular stents, improved cardiomyocyte function on heart patches composed of nanomaterials, and decreased paralysis from stroke using stem cell delivery with nanomaterials. Moreover, this presentation will provide how nanotechnology is driving cardiovascular medicine into the next century through the design of improved implantable sensors for the cardiovascular system. Throughout it will emphasize research which is now being commercialized into real products helping human health.

Audience Take Away Notes

- Definition of cardio nanomedicine
- How nanomedicine is being used to treat cardiovascular disease
- The future of nanomedicine for the healing the heart



Thomas J. Webster

School of Health Sciences and Biomedical Engineering, Hebei University of Technology, Tianjin, China

Co-founder, Interstellar Therapeutics, Mansfield, MA, United States

Biography

Thomas J. Webster's (H index: 122; Google Scholar) degrees are in chemical engineering from the University of Pittsburgh (B.S., 1995; USA) and in biomedical engineering from RPI (Ph.D., 2000; USA). He has served as a professor at Purdue (2000-2005), Brown (2005-2012), and Northeastern (2012-2021; serving as Chemical Engineering Department Chair from 2012 - 2019) Universities and has formed over a dozen companies who have numerous FDA approved medical products currently improving human health in over 20,000 patients. His technology is also being used in commercial products to improve sustainability and renewable energy. He is currently helping those companies and serves as a professor at Brown University, Saveetha University, Vellore Institute of Technology, UFPI, and others. Dr. Webster has numerous awards including: 2020, World Top 2% Scientist by Citations (PLOS); 2020, SCOPUS Highly Cited Research (Top 1% Materials Science and Mixed Fields); 2021, Clarivate Top 0.1% Most Influential Researchers (Pharmacology and Toxicology); 2022, Best Materials Science Scientist by Citations (Research.com); and is a fellow of over 8 societies. Prof. Webster is a former President of the U.S. Society For Biomaterials and has over 1,350 publications to his credit with over 55,000 citations. He was recently nominated for the Nobel Prize in Chemistry. Prof. Webster also recently formed a fund to support Nigerian student research opportunities in the U.S.

Novel signaling pathways and therapeutic options for pulmonary hypertension

Pulmonary Hypertension (PH) is a common and devastating lung disease. The current primary medications for this disease are to use non-specific vasodilators, but patients do not always respond well to non-specific vasodilators. Voltage-dependent potassium channels and store-operated calcium channels may increase intracellular calcium concentration Ca^{2+} in Pulmonary Arterial Smooth Muscle Cells (PASMCs) to mediate the development of PH; however, experimental findings are uncertain. In a series of studies, we have explored the potential important role of Ryanodine Receptor 2 (RyR2) Ca^{2+} release channel in PH and its inhibition as therapeutic strategies for this disease. Our findings reveal that Rieske Iron-Sulfur Protein (RISP) serves as a primary molecule to increase mitochondrial Reactive Oxygen Species (ROS) generation, disassociate FKBP12.6 from RyR2, enhance the channel activity, and then induces calcium release from the sarcoplasmic reticulum (a major intracellular Ca^{2+} store), hereby causing PA vasoconstriction, remodeling, and ultimately hypertension. Moreover, the increased RISP-dependent ROS can also cause DNA damage to activate Ataxia Telangiectasia Mutated (ATM) kinase, phosphorylate Checkpoint Kinases 2 (Chk2), and cause cell proliferation in PASMCs, leading to PA remodeling and hypertension. Our results further indicate that specific pharmacological and genetic RISP, RyR2, FKBP12.6 dissociation, ATM, and Chk2 inhibition may become specific and effective treatment options for PH and other relevant vascular diseases.

Audience Take Away Notes

- Our current presentation will greatly help the audience to create their future research directions
- The finding presented may significantly assist the audience to develop novel preventive and therapeutic strategies for PH and other relevant pulmonary diseases
- Our research could also be used by other investigators to expand their research and/or teaching



Yong Xiao Wang

Department of Molecular and Cellular Physiology, Albany Medical College, Albany, New York, United States

Biography

Dr. Yong Xiao Wang has been a Full Professor in Department of Molecular and Cellular Physiology at Albany Medical College since 2006. Dr. Wang obtained his MD at Wannan Medical University, PhD at Fourth Military Medical University, and postdoctoral training at Technology University of Munich as well as University of Pennsylvania. He has made many important findings using complementary molecular, biochemical, physiological, and genetic approaches at the molecular, organelle, cellular, tissue and organism levels in animals and human samples, had numerous publications in Nature Commun (impact factor: 14.290), Antioxid Redox Signal (8.209), Proc Natl Acad Sci USA (9.432), Nature (34.480), Circ Res (9.214), and other highly peer-reviewed journals and academic books, and served as the editorial board member and/or section editor as well as the executive committee member and/or subcommittee chair for professional societies.

JUNE

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2nd Edition of

International Heart Congress



SPEAKERS



Asma Ayadi

Research Laboratory on Energy and Matter for Nuclear Science Development (LR16CNSTN02), Tunisian Center for Nuclear Sciences and Technology, Technopark Sidi Thabet, Tunisia

The potential of machine learning to predict the arterial stiffness from hemodynamics and biomechanics parameters

Arterial stiffness has emerged as a prominent marker of risk for cardiovascular disease. Few studies are interested in predicting symptomatic or asymptomatic arterial stiffness from hemodynamics and biomechanics parameters. Machine learning models can be used as an intelligent tool for therapeutic detection of variations in hemodynamic and biomechanical parameters. Arterial stiffness is related to hemodynamics and biomechanics parameters significant change, such as an increase in age, local wave velocity, arterial elastance, Young's modulus, the amplitude of the reflected wave increase, and a decrease in arterial compliance, the arrival time of the reflected wave, the reflection coefficient. Therefore, this study aims to implement a method based on machine learning algorithms for the detection of arterial stiffness. The aim of this study was to investigate the ability of Machine Learning (ML) approaches to predict wall stiffness in the carotid artery for assessing the risk of Cardiovascular (CV) events. A mathematical model developed in previous work was used to determine hemodynamic and biomechanical features. Accuracy, sensitivity and specificity are calculated to evaluate the performance of ML algorithms. The accuracy obtained for eighteen machine-learning classifiers is presented. The results obtained show that the best performing classifiers using hemodynamic parameters (accuracy=100%) are the support vector machine, random forest, neural network, decision tree, logistic regression, and k-nearest neighbor. The specificity and sensitivity of these models are 100% and 100% respectively.

Biography

Dr. Asma studied biophysics, medical physics and medical imaging at Tunis Manar University, Tunisia, graduating with an MS in 2014. She then joined the Laboratory of Biophysics and Medical Technology research group at the Higher Institute of Medical Technologies of Tunis (ISTMT). She obtained her PhD in 2020 at the same institution. Her research focuses on biomedical imaging, biomedical signal processing, and biomechanics. In addition to her academic achievements, she spent more than six years as an assistant professor at the University of Sfax between 2016 and 2022. Since 2022, Dr. Ayadi has held the position of assistant professor in nuclear medical imaging at the National Center for Nuclear Sciences and Technologies (CNSTN). She has published more than ten research papers.



Asma Syed MD FACC FHRS

Brookdale Hospital Medical Center, (One Brooklyn Health), Brooklyn, NY, 11212, United States

Keeping people in rhythm electronically – An overview of cardiac rhythm management devices

Core Concept: Use of outside energy to stimulate the heart – for pacing and defibrillation.

Will start with the basic concept of pacing and defibrillation. Will show the audience the timeline of how technology has changed starting with pacemaker development and how difficult it used to be to provide pacing for patients. Followed by implantable defibrillator development and how the criteria has changed for which patient can qualify for a defibrillator largely based on the device change and relatively straightforward implant procedure. Review of the difficulty initial scientist had to take care of their patients who required device implant and the obstacles they faced to develop these devices. Will show the recent advancement including newer devices, both for pacing and defibrillation and demonstrated the lower risk of infections/endocarditis with the newer devices. Will give an overview of indications for ICD implant in the US based on clinical trials. Will show how patient comfort has been achieved with these newer devices. Will also demonstrate how a good quality of life with these devices has been achieved.

Re-emphasis need for appropriate referral for the correct patent to be prescribed these devices. Re-iterate the survival benefit of PPM/ICD's along with symptoms relief. Hope that physicians will include the data provided while seeing both inpatients and outpatient and provide the proper referral for device implant.

To help physicians be aware of the newer technology available for their patients and be able to explain these to their patients. Also hope physicians can answer any questions that their patients might have before referral to a specialist for device implant.

Biography

Dr. Syed obtained her bachelors degree in Biochemistry from Stony Brook University in 1994 followed by MD degree from Ross University in 1999. She completed her Internal medicine residency in 2002 from Brookdale Hospital Medical Center in Brooklyn, New York followed by Cardiology and Electrophysiology Fellowships at SUNY Downstate Medical Center in Brooklyn, New York. She is presently the Director of the Electrophysiology Laboratory at Brookdale Hospital Medical Center and is a Clinical Associate Professor of Medicine at SUNY Downstate Medical Center



Ayisha Z. Bashir[1]*, Danae Dinkel[2], Iraklis I. Pipinos[3,4], Sara A. Myers[4,5]

[1]Department or Cardiology, University of Nebraska Medical Center and Childrens Hospital and Medical Center, Omaha, Nebraska
[2]School of Health and Kinesiology, University of Nebraska at Omaha, Omaha, NE, United States
[3]Department of Surgery, University of Nebraska Medical Center, Omaha, NE, United States

[4]Department of Surgery, Omaha VA Medical Center, Omaha, NE, United States
[5]University of Nebraska Medical Center, Omaha, NE, United States

The benefits of assistive devices and physical activity in cardiac and geriatric patients with peripheral artery disease

Peripheral Artery Disease (PAD) is a cardiovascular disease affecting more than 8.5 million Americans over the age of 40 years and is prevalent in the geriatric cardiology population. PAD is a manifestation of systemic atherosclerosis, characterized by atherosclerotic blockages of the arteries supplying the legs. Claudication, or pain in the legs precipitated by activity such as walking, is the most common symptom of PAD. Treatment for PAD is aimed at improving the blood flow and includes lifestyle modifications. Some of these preventive measures are smoking cessation, a low-cholesterol diet, controlling diabetes and blood pressure, and improved physical activity including supervised walking programs, and assistive devices for walking. Patients with PAD experience reduced mobility, reduced physical functioning, poor health outcomes, and increased risk of falls. This leads to generally adopting an inactive lifestyle; hence, even small changes in physical activity could reduce the risk of an adverse cardiovascular event.

For patients with peripheral artery disease compliance with non-invasive interventions like assistive devices including an Ankle Foot Orthosis (AFO) and long-term exercise therapy is important for improved health outcomes. Benefits to patients can only be measured if patients with peripheral artery disease adhere to the intervention and barriers are identified with improved solutions. Barriers associated with AFO function that prevent common activities and poor health seem to be the biggest issue for not wanting to wear the AFO after the 3-month intervention. Addressing patients' perceptions and challenges to wearing the AFO is essential to increasing compliance and physical activity. Future research should concentrate on understanding the compatibility of orthotic device interventions with the subject's lifestyle.

This was the doctoral research that was put together as the dissertation and published in renowned journals.

Audience Take Away Notes

- The audience will learn how to manage PAD patients conservatively
- Nonsurgical interventions and encouraging physical activity are a lower cost-effective method of managing PAD patients
- Expanding the knowledge of nonsurgical interventions can be added to the research and teaching of the faculty, as a novel method to manage chronic PAD patients

Biography

Dr. Ayisha Bashir completed her MBBS, pursued an MS in clinical informatics at the University of Nebraska, and pursued a Ph.D. in Biomechanics, and Kinesiology. She then joined the research group of Dr. Angela Yetman at the University of Nebraska Medical Center and Children's Hospital and Medical Center, Department of Cardiology. She has published over 20 articles including two dissertations. She has mostly pursued research related to cardiac patients, including telehealth management of cardiac patients, and improving physical activity in PAD patients.



Blake Gardner
Enterprise Senior Medical Director Cardiovascular Clinical Programs
Intermountain Health, United States

Cardiovascular hospitalist: A paradigm shift impact of specialty hospitalists on clinical, financial, and operational care delivery in a large us health care institution (Intermountain Health)

Intermountain health is a large integrated healthcare institution in the western United States that prioritizes value-based care, even at times when it appears contrary to regional and national payment models. Because of this focus, Intermountain health has been at the forefront of value-based care in the United States. This has led to innovative care process models that are designed to deliver on the value equation for the betterment of the communities it serves. Health care delivery in the United States has been criticized over the past few decades for not delivering on the value equation to the people it serves. This equation is typically defined in terms as quality, access, and experience divided by the overall cost.

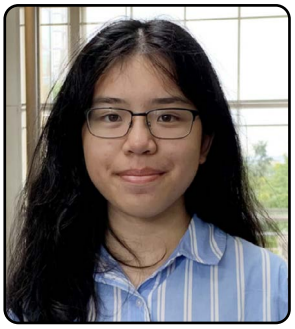
Cardiovascular care is certainly an area where value can be gained or lost quickly due to the complexity of its ecosystem. As part of a value-based initiative at intermountain health, cardiovascular hospitalists were introduced into our largest Cardiac Hospitals with intent to deliver on value by optimizing clinical and operational outcomes at a reduced cost. This was a paradigm shift for inpatient management of cardiac patients, in contrast to the traditional care models of cardiologists or general hospitalists caring for these patients. We compared key clinical, operational, and financial metrics between cardiac hospitalists and traditional care models from top decile performing hospitals in the United States as reported by the vizient database.

Audience Take Away Notes

- Understand the value equation in healthcare
- Contemplate the relationship between operational, financial, and clinical lanes and their impact on the value equation
- Reported outcomes of a value-based initiative of cardiac hospitalists in a large US healthcare system

Biography

Dr. Gardner is an Interventional Cardiologist that is specialty trained in structural heart disease. He received his MD degree at the University of Miami Miller School of medicine. He then completed his medical internship and residency at the University of Utah. He went on to specialize in Interventional Cardiology and Structural Heart Disease at the University of Rochester. He is board certified in Cardiovascular Disease and Interventional Cardiology. Dr. Gardner joined Intermountain Health in 2013 and served as the Director of Structural Heart and Endovascular programs at Saint George Regional Hospital. In 2022 he then assumed the role of Enterprise Senior Medical Director for the heart and vascular program. In this role his focus is to optimize clinical, financial and operational outcomes throughout the 8 state footprint of Intermountain Health.



Catherine Le[1]*, Jade Gauvin[1], Mukandila Mulumba[1], Emmanuelle Schelsohn[2], William Lubell[3], Huy Ong[1], Sylvie Marleau[1]

[1]Faculty of Pharmacy, Universite de Montreal, Montreal, Quebec, Canada
[2]Faculty of Pharmacy, University of Geneva, Geneva, Switzerland, Emmanuelle
[3]Department of Chemistry, Universite de Montreal, Montreal, Quebec, Canada

The anti-atherosclerotic agent MPE-298 mediates mitochondrial oxidative stress through trafficking of the cluster of differentiation 36 (CD36) receptor in macrophages

It is known that oxidized Low Density Lipoproteins (oxLDL) interaction with the Cluster of Differentiation 36 (CD36)/SR-B2, a scavenger membrane protein, at the surface of macrophages, leads to an internalization of oxLDL in the cells. During atherosclerosis development, an excessive internalization of oxLDL by CD36 in the macrophages leads to the formation of foam cells, which induces mitochondrial oxidative stress, inflammation, and plaque formation. The cyclic azapeptide MPE-298 is a synthetic molecule derived from the Growth Hormone Releasing Peptide-6 (GHRP-6) and has been found to selectively bind to CD36 with high affinity. Featuring anti-inflammatory and anti-atherosclerotic activities in apolipoprotein-E deficient mice as a model for atherosclerosis, the azapeptide induced a significant reduction of aortic lesions progression, plaque instability biomarkers and release of pro-inflammatory cytokines. To characterize the mechanism of action of MPE-298, in vitro studies were conducted in macrophages, with results showing the peptide's modulatory effect on the development of atherosclerosis and inflammation. The mitochondrial oxidative stress induced by oxLDL was found reduced after macrophage incubation with MPE-298, in a CD36-dependent manner. MPE-298 was found to induce CD36 internalization and its intracellular trafficking via the endosomal pathway towards lysosomes as assessed by fluorescence microscopy. Although MPE-298 was found to induce CD36 internalization in the same manner as oxLDL, CD36, after binding to oxLDL, was rather directed towards the early endosomes. The distinctive intracellular trafficking and disposition of CD36 after its binding to the MPE-298 azapeptide, as compared to after its binding to oxLDL, might result in the differential effect on mitochondrial oxidative stress that was observed in macrophages, highlighting the dampening effect of MPE-298 on inflammation.

Audience Take Away Notes

- Atherosclerosis is the primary cause of heart disease and stroke. Our studies introduce a novel peptide and therapeutic target, as well as their mechanisms, to potentially help prevent or treat atherosclerosis, especially in patients who do not respond well to current treatments available, such as statins or ezetimibe. This is an important unmet need in patients, which our research can help fulfill
- The presentation will cover our methodologies, from our in vitro studies using various cell culture techniques to in vivo studies using an atherosclerotic model of mice. This might help give insight to researchers in the audience potentially interested in studying certain subjects requiring the same techniques
- The receptor we will focus on during the presentation, the CD36 receptor, is a receptor expressed in a ubiquitous way in various cell types and represents an important therapeutic target in a variety of pathologies, not just atherosclerosis. Our presentation might help researchers in the audience in various domains of expertise gain interest in CD36 as a therapeutic target and expand their studies

Biography

Catherine Le is a student in pharmaceutical sciences currently pursuing her master's degree in the Faculty of Pharmacy of the Universite de Montréal, in the laboratories of Dre Sylvie Marleau and Dr. Huy Ong. Her focus is on studying the CD36 receptor and its ligands, as well as its implication in cardiovascular diseases such as atherosclerosis.



Corey E. Tabit
Section of Cardiology, Department of Medicine, University of Chicago, Chicago, Illinois, United States

Standardization of cardiovascular care using clinical pathways – a practical approach to implementing clinical guidelines and evidence-based medicine

While cardiovascular disease remains the most common cause of death worldwide, clinical approaches to the management of common cardiovascular conditions such as heart failure, coronary artery disease, and atrial fibrillation vary widely from institution to institution and from provider to provider. Despite the existence of widely-published multi-society guidelines for many cardiovascular conditions, initial diagnostic workup, medical therapy, timing of referral for procedures, and other pivotal decisions in the care continuum are often guided more by provider habit and practice inertia rather than the most recent available evidence, leading to variation in clinical outcomes. Standardization of these and other care processes related to the workup and treatment of cardiovascular conditions leads to more reproducible outcomes and overall improvement in patients' symptoms and quality of life. However, distilling the large volume of available evidence and guidelines into practical care algorithms which providers can use to guide care in the real world can be a daunting task. Clinical pathways are a powerful tool for standardizing care processes and guiding providers toward the most evidence-based approaches to common conditions. In this lecture, we will discuss a practical approach to building clinical pathways for the management of common cardiovascular conditions in the inpatient and outpatient settings including our approach to weighing available evidence, building provider consensus, designing and refining the pathways, initial pathway launch, sustaining the change, measuring success, and updating the pathways as new evidence emerges. This discussion will draw heavily from our 10 years of experience building clinical pathways at the University of Chicago with special focus on generalizable points that can be applied to attendees' home institutions.

Audience Take Away Notes

By the end of this discussion, attendees will

- Understand how practice variation affects clinical outcomes
- Understand common factors leading to practice variation
- Understand how clinical pathways can be used to standardize practice
- Understand the process by which clinical pathways can be constructed and refined
- Understand common pitfalls and barriers to pathway usage and how to address them

Biography

Dr. Tabit earned his Doctor of Medicine degree from Jefferson Medical College of Thomas Jefferson University (Philadelphia, Pennsylvania, USA), and completed his Internal Medicine residency and Vascular Medicine fellowship at Boston University Medical Center (Boston, Massachusetts, USA). He completed fellowship training in Cardiovascular Medicine at The University of Chicago Medical Center (Chicago, Illinois, USA). Dr. Tabit also holds a PhD in Molecular Pathology from The University of Chicago, an MBA in Finance and Health Sector Management from Boston University School of Management, and an MPH in Epidemiology and Health Policy from Boston University School of Public Health. He serves as the Director of Quality and Director of Cardiovascular Data Sciences for the Heart and Vascular Center at the University of Chicago where his research interests include healthcare delivery science, process standardization, and the effects of social determinants of health on cardiovascular outcomes.



Corey E. Tabit
Section of Cardiology, Department of Medicine, University of Chicago, Chicago, Illinois, United States

The effects of local violent crime on cardiovascular disease and risk factors

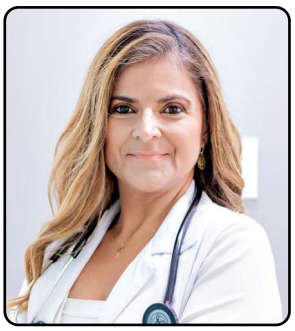
Cardiovascular disease is the #1 killer of adults worldwide, with low-socioeconomic urban patients more severely affected. Social Determinants of Health (SDOH) such as community violence, elements of the built environment, income, literacy, and access to food and pharmacy are all linked to changes in cardiovascular outcomes. Our group has demonstrated a temporal link between local violent crime and changes in cardiovascular risk factors such as blood pressure and cholesterol. Further, we have demonstrated changes in cardiovascular outcomes such as hospital admissions for cardiovascular reasons during times of increased local violence. Recently, we have found significant elevations in blood pressure when patients are exposed to local violent crimes, the sound of gunfire near their homes, and changes in local street gang territories. These physiologic changes lead to elevation in the calculated 10-year risk of developing atherosclerotic cardiovascular disease by the Pooled-Cohort Equation. Taken together, these findings demonstrate a strong temporal association between community violence and cardiovascular risk and suggest that patients who are exposed to local violence may be at higher risk for developing cardiovascular disease than currently-available risk calculators may indicate. This lecture will summarize the available evidence linking community violence with cardiovascular disease, both in an urban setting as well as other settings, and will discuss the latest evidence linking SDOH with cardiovascular disease. We will then discuss interventions that healthcare providers can use to support patients exposed to community violence to improve cardiovascular outcomes. This discussion will draw heavily from our 10 years of experience building interventions for vulnerable urban patients at the University of Chicago with special focus on generalizable points that can be applied to attendees' home institutions.

Audience Take Away Notes

- Understand common social determinants of health (SDOH)
- Understand available evidence linking SDOH to cardiovascular disease
- Understand how community violence affects cardiovascular risk
- Understand some tools that healthcare providers can use to support patients exposed to community violence

Biography

Dr. Tabit earned his Doctor of Medicine degree from Jefferson Medical College of Thomas Jefferson University (Philadelphia, Pennsylvania, USA), and completed his Internal Medicine residency and Vascular Medicine fellowship at Boston University Medical Center (Boston, Massachusetts, USA). He completed fellowship training in Cardiovascular Medicine at The University of Chicago Medical Center (Chicago, Illinois, USA). Dr. Tabit also holds a PhD in Molecular Pathology from The University of Chicago, an MBA in Finance and Health Sector Management from Boston University School of Management, and an MPH in Epidemiology and Health Policy from Boston University School of Public Health. He serves as the Director of Quality and Director of Cardiovascular Data Sciences for the Heart and Vascular Center at the University of Chicago where his research interests include healthcare delivery science, process standardization, and the effects of social determinants of health on cardiovascular outcomes.



Cristina Milagre Quadros Borges
Hcor- Hospital do Coracao de Sao Paulo, Brazil

Harm reduction in smoking: What does the scientific evidence say?

Smoking is considered a chronic disease, caused by chemical dependence of nicotine. This is highly addicting, it in the brain system, it influences our emotions increases the feeling of pleasure/humor and reduces the anxiety. In a planet with about 8 billion people, around 1,36 billion are smokers. Cigarette smoking is the leading cause of preventable death in the world, around 8 million people die every year. A global public health problem, and those who smoke are vulnerable to 50 tabacco-related diseases, several kinds of cancer, lung diseases, cardiovascular disease, erectile dysfunction, female infertility and pregnancy complications. In 2020, according to data from the World Health Organization, 22,3% of the world population consumed tabacco, 36,7% of men and 7,8%of women. In brazil, due to policies implemented to smoking control, we had a significant drop in the of period (1989 to 2019) from 34,8% of smokers to 12,6% and in 2021, the total percentual of smokers age 18 or over was 9.1%. All forms of tobacco consumption are harmful to health and there is no safe level. Cigarette smoke 4.720 differents toxics substances such as nicotine, irritants, alcatroa and carbon monoxide. In the last 15 years, new heated tobacco devices have arrived on the market with promises of less harm to health. In 78 countries this products are available, including Japan, The United States, Canada, Portugal, Astralia, Italy and The United Kingdom. As they do not cause tobacco combustion, they criate significantly lower levels of toxic substances, which is the strongest arguments made by defenders of those products. A systematic review of the literature in 2018 on heated tobacco products identified 31 studies randomly and blind over those devices, 11 independent and 20 funded by the products manufacturers, needing further long-term research. Another systematic review (relevant studies from 2015 to Februery 2021), both "in vitro" as alive has shown that the benefit of heated tobacco are controversial and more research is needed to the short-and-long term health effects. Another large concern is that availability of these smokeless products may encourage cigarette consuption, especially among young people and often with the combined use of traditional cigarettes and heated tobacco products.

Biography

Cristina Milagre Quadros Borges is a Cardiologist at Hospital of Heart in Sao Paulo, Clinic Check-up and outpatiente care. Graduated from the College of Medical of Petropolis, Rio de Janeiro in 2001. Specialization in Clinical Cardiology at the Real and Benemerita Society Portuguese the Beneficencia in Sao Paulo from 2002 to 2004. Specialization in Eletrocardiograpy from University of Sao Paulo, University of Medical (2004 to 2006). Specialist in Cardiology by Brazilian Society by Cardiology in 2006 and Ergometry in 2007. Postgraduated in Exercise and Medical Sport (2021 to 2023) and Specialist in Medical Sport by the Brazilian Society of Exercice and Medical Sport in 2023.



Daniel A. Lichtenstein

Department or Intensive Care Medicine, Assistance Publique de Paris, Hospital Ambroise Pare, Paris, France

The BLUE-protocol: Diagnosing hemodynamic pulmonary edema using lung ultrasound

Critical ultrasound was defined in our 1991 publication: "ultrasound for the critically ill, by the critical care physician, whole body ultrasound". This definition, considering the lung, provides a new definition of ultrasound, now a clinical tool.

The BLUE-protocol is a fast protocol enabling immediate diagnosis of acute respiratory failures. It requires a simple gray-scale unit, a microconvex probe. It analyzes ten signs: bat sign (pleural line), lung sliding, A-lines (horizontal artifacts arising from pleural line), quad sign and sinusoid sign indicating pleural effusion, fractal sign and lung sign indicating lung consolidation, B-lines (particular comet-tail artifacts arising from the pleural line among seven criteria), and lung rockets (multiple B-lines, indicating interstitial syndrome), abolished lung-sliding with stratosphere sign, suggesting pneumothorax, lung point indicating pneumothorax. Three points of analysis per lung are defined (two anterior, one caudal and as posterior as possible). Hemodynamic pulmonary edema (HPE), pneumothorax, pulmonary embolism, pneumonia, COPD, asthma, were assessed using CT (gold standard) with sensitivity and specificity ranging from 90 to 100%1.

The B-profile is defined by the association of lung-rockets with lung sliding, symmetrical on the four anterior points, without any anterior consolidation. The B-profile is 97% sensitive and 95% specific to HPE, when six factors (the BLUE-factors) are respected1. Simple machine, able to analyze lung ultrasound, respect of the semiology of the B-lines, respect of the definition of the B-profile, patient in acute respiratory failure, BLUE-protocol done during dyspnea, and inclusion of only certain diagnosis of HPE, without intricated other diagnosis (such as pneumonia).

The A-line indicates non elevated PAOP2. The BLUE-protocol is a holistic protocol, because it allows estimation of left heart function in numerous settings (critically ill to ambulatory patient, neonates to seniors, wealthy to scarse-resource areas).

Shortly, derived products. The FALLS-protocol uses, in acute circulatory failure, the B-line as direct parameter of clinical volemia and endpoint for fluid therapy. The SESAME-protocol, used during cardiac arrest : Very briefly, after exclusion of shockable cause, the lung is analyzed first (pneumothorax), then a carefully chosen venous area (called the V-point) searching for DVT at this location, then search for peritoneal fluid, then search for pericardial tamponade. The very heart comes last. The whole analysis, with our holistic approach, takes far less than one minute (four seconds for the first step, 35 seconds when reaching step 5).

CEURF trains since 1989 at the bedside in our ICU.

Audience Take Away Notes

- By listening the lecture (which advises among others the purchase of simple cost-effective machines with a single, universal probe)

- By diagnosing hemodynamic pulmonary edema with many benefits (first one, immediate diagnosis, see some others below)
- Yes, this research that other faculty could use to expand their research and teaching
- Yes, definitely this provide a practical solution to a problem that could simplify or make a designer's job more efficient
- Radiation-free diagnosis
- Allows to skip this very painful arterial blood puncture
- Allows easy differential diagnoses of acute respiratory failure
- Allows simplification of expert Doppler echocardiography

Biography

Daniel Lichtenstein is medical intensivist, Ambroise-Pare Hospital (Paris). Defined critical ultrasound since 1985 (Intensive Care Med 1991;19:353-355) describing diagnoses, immediate therapies, procedures (venous canulation, thoracentesis...) in a holistic approach, favoring simple equipment, one universal probe for whole body, emphasis on lung, simple cardiac sonography (and others), extrapolable to multiple disciplines (pediatry, pulmonology...), settings (ICU, austere areas...), patients (from bariatric to neonates). One textbook (1992, 2002, 2005, 2010, 2011, 2016 editions, Springer-Verlag), original articles including: BLUE-protocol (acute respiratory failure), FALLS-protocol (lung ultrasound in circulatory failure), SESAME-protocol (cardiac arrest), lung ultrasound in neonates. President of CEURF (training center at bedside in I.C.U.).



Eesha Wahid[1]*, Naireen Asim[2], Kashaf Imran Zaidi[3], Ali Raja[2], Raian Jaibaji[4], Ibadur R A Siddiqui[5], Hamzah Ali[6], Syeda Anum Zahra[7]

[1]School of Medicine, Trinity College Dublin, Dublin, Ireland
[2]School of Medicine, St George's University of London, London, United Kingdom
[3]Barts and The London School of Medicine and Dentistry, Queen Mary University of London, London, United Kingdom
[4]School of Medicine, University College London, London United Kingdom
[5]School of Medicine, University of Liverpool, Liverpool, United Kingdom
[6]School of Medicine, University of Plymouth, Plymouth, United Kingdom
[7]The Hillingdon Hospital NHS Trust and Imperial College School of Medicine, Uxbridge, United Kingdom

An update on optimisation of cardiovascular health in pregnancy

Increased physiological demands coupled with haemodynamic changes occurring during pregnancy pose a unique and significant challenge to the cardiovascular system. Pregnant women are at risk of suffering from the exacerbation of pre-existing Cardiovascular Disease (CVD) as well as the precipitation of new cardiac events. Historically, pregnant women have been vulnerable to undertreatment due to perceived fear of harm to the foetus and the lack of evidence-based treatment guidelines leading to uncertainty and conservative treatment choices by healthcare providers. The presentation aims to review current practice, highlight gaps in knowledge, as well as to propose strategies that will improve outcomes for the obstetric population with CVD.

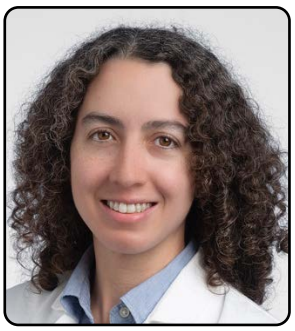
Targeted protocols for the optimal management of specific conditions such as hypertension, hypercholesterolemia, heart failure during pregnancy will also be discussed. Our key findings emphasise the benefits of early risk stratification and personalised care plans with precise medical management. A comprehensive and multidisciplinary approach is of critical importance which incorporates patient education, lifestyle modifications and navigating psychosocial stressors to optimise care.

Audience Take Away Notes

- The findings can be used to guide evidence-based clinical practices
- Identification and understanding of the risk factors can lead to better risk assessment and early intervention therefore having a direct impact on patient outcomes
- Highlight areas for further research
- Provide an opportunity for active discussion and increase advocacy for maternal and foetal health

Biography

Eesha Wahid is a medical student in her penultimate year of studies at Trinity College Dublin, Ireland. Alongside engaging with her clinical rotations and studies, she is passionate about getting involved in research opportunities and aspires to help bridge the gap between medical science and patient care.



Elizabeth C. Ghandakly
Internal Medicine Residency Program, Cleveland Clinic Foundation, Cleveland, OH, United States

Comparative policies in preventative cardiology across the world

Recommendations for the primary prevention of Cardiovascular Disease (CVD) vary by global region. This variability occurs by nature of different practice guidelines being put forth by separate regional cardiology societies, such as The American College of Cardiology/American Heart Association (ACC/AHA), the 2022 United States Preventative Services Task Force (USPTF), and European Society of Cardiology (ESC). Approaches to risk evaluation and management differ in many ways, including types of risk factors to consider, tools used to assess risk, populations to screen, and recommended interventions. This presentation will examine the differing healthcare system contexts of various regions that may way on primary prevention approaches, requisite stated goals for primary prevention regionally, and ways in which the differing primary prevention guidelines may track those factors. This will include an overview of the 2019 ACC/AHA Guidelines on CVD prevention, the 2021 ESC Guidelines on CVD prevention, and the 2022 USPTF guidelines on CVD prevention, and their major differences. It will also include a brief overview of which clinicians in other global regions tend to reference either guideline in practice. Attention will be paid to what major trials are cited by each, stated rationales for differing guidelines, major healthcare system differences, and perceived regional values such as population health or global and climate health. Finally, it will consider for discussion ways in which each system may holistically impact the other looking forward to future guidelines.

Audience Take Away Notes

- Learn major regional differences in guidelines for primary prevention of cardiovascular disease across the world
- Compare the major CVD primary prevention guidelines—ACC/AHA, ESC, USPTF—to identify important similarities and differences
- Consider myriad reasons contributing to regional differences, including population health, health systems, and scientific evidence
- The audience will be able to gain a better understanding of the differences in these guidelines and what drives them and, as a result, think critically about what risk modifiers, screening, and interventions to consider for various patients

Biography

Dr. Elizabeth Ghandakly is an Internal Medicine Resident Physician at Cleveland Clinic in Cleveland, OH, USA. She graduated medical school at George Washington University School of Medicine and Health Sciences, where she was inducted into the Gold Humanism Honor Society. She also completed her Masters in Bioethics at Johns Hopkins University while in medical school. Prior to medical school, she practiced corporate law for a number of years, doing contract negotiation for large IT corporations after graduating law school from The Ohio State University. With a deep interest in health policy, she served an appointment to the City of Alexandria Public Health Advisory Commission from 2016-2018 and worked as a Health Policy Advisor to a Virginia State Delegate. Prior to law school, Dr. Ghandakly graduated from The Ohio State University with a dual degree in Economics and Political Science and an Arabic minor, including a semester abroad at the University of Damascus in Syria. She is part of the Clinician Educator Track at Cleveland Clinic and has interest in cardiology, global health policy, and medical education.



Helen Senderovich[1,2]*, Justin Chow[4], Shaira Wignarajah[1,3]

[1]Department of Family and Community Medicine, Baycrest Health Sciences, Toronto, Ontario, Canada
[2]Division of Palliative Care, Department of Family and Community Medicine, Faculty of Medicine, University of Toronto, Ontario, Canada
[3]Faculty of Health, York University, Toronto, Ontario, Canada
[4]Department of Medicine, University of Calgary, Canada

Integration of palliative care for patients with Congestive Heart Failure (CHF)

Introduction: Congestive Heart Failure (CHF) is an increasingly prevalent terminal illness in a globally aging population. Despite optimal medical management, prognosis remains poor – a fact seldom communicated to patients and/or their families. Evidence suggests numerous benefits of palliative care consultation in advanced CHF but to date, their services remain woefully underutilized.

Objectives: To identify specific challenges to accessing and implementing palliative care in patients with advanced CHF, and to use this information to formulate recommendations for practice.

Methods: Literature review whereby recommendations for practice were formulated on the basis of primary quantitative/qualitative data and consensus expert opinion.

Results: Accessing palliative care services for patients with CHF remains a challenge for numerous factors including prognostic uncertainty, misconceptions about what palliative care is, and difficulty recognizing when a patient is suitable for referral. Strategies to improve access/delivery of palliative care to this population include education and proper discussion about prognosis/goals of care. A team-based approach is essential as we move towards a model where symptom palliation exists concurrently with active medical disease-modifying treatment.

Conclusion: Despite evidence that palliative care has a role in improving symptom control and overall quality of life in patients with end-stage CHF, a multitude of challenges exist and this ultimately hinders access to palliative care services. Education to abolish pre-existing misconceptions about the role of palliative care and a movement towards a team-based approach focused on simultaneous palliative and traditional medical care will undoubtedly improve access to, and benefit from, palliative care services in this population.

Biography

Dr. Senderovich is a physician with practice focused on Geriatrics, Palliative Care, and Pain Medicine. She is actively involved in teaching medical students and residents. She has broad international experience and a solid research background. Her research was accepted nationally and internationally. She has been involved in collaborative work to improve access to palliative care at the international level. She is an author of multiple manuscripts focused on geriatrics, pain management, patient-centered care, ethical and legal aspect of doctor -patient relationship, palliative and end-of-life care.



Iris Panagiota Efthymiou
Global Public Health, University of East London, London, Executive Business Centre, University of Greenwich, United Kingdom

Bridging economics and behavior for cardiovascular wellness

The pursuit of cardiovascular wellness is of paramount global concern, touching the lives of many individuals and societies. Understanding the intricate interplay between economics and behavior in the context of heart health is pivotal for crafting effective strategies to mitigate the burden of cardiovascular diseases. The presentation will embark on an enlightening journey that delves deep into the intersection of two vital domains: Behavioral health economics and cardiovascular health. This multidisciplinary exploration will unravel the intricate web of factors that influence the choices individuals make in terms of heart-healthy behaviors and the economic implications of those choices.

Audience Take Away Notes

- **Behavioral Economics of Heart Health:** We will delve into the fascinating world of behavioral economics, shedding light on how cognitive biases, decision-making heuristics, and social influences shape our choices related to diet, exercise, and medication adherence. Understanding these nuances is essential for designing interventions that nudge individuals towards heart-healthy behaviors
- **Economic Impacts of Cardiovascular Disease:** A comprehensive analysis of the economic burden imposed by cardiovascular diseases on individuals, families, and healthcare systems will be discussed. This section will highlight the economic incentives and disincentives that influence health-seeking behaviors, preventive measures, and treatment compliance
- **Policy Interventions:** The presentation will showcase successful policy interventions from around the globe that have harnessed insights from behavioral health economics to improve heart health outcomes. These case studies will demonstrate the potential of aligning economic incentives with positive health behaviors
- **Behavioral Interventions:** Practical strategies for leveraging behavioral insights to promote heart-healthy behaviors will be explored. From personalized interventions based on behavioral economics principles to the role of digital health technologies, we will unveil innovative approaches to empower individuals to make healthier choices
- **Future Directions:** The presentation will conclude by outlining the future directions in the field of behavioral health economics and cardiovascular wellness. It will touch upon the potential for technological advancements, big data analytics, and global collaborations to further enhance our understanding and application of these concepts
- In an era where cardiovascular diseases remain a leading cause of morbidity and mortality worldwide, this presentation serves as a beacon of hope and knowledge. By bridging the gap between economics and behavior, we aim to inspire healthcare professionals, policymakers, and researchers to collaborate in designing impactful interventions that will lead us towards a heart-healthy global future

Biography

Dr. Iris-Panagiota Efthymiou, has a PhD in Behavioral Health Economics from the University of Piraeus, Greece. She is a Lecturer at the University of Greenwich and the University East London, Board Member of HAPSc, As. Researcher at the Laboratory of Health Economics and Management (LabHEM) at the University of Piraeus. She has more than 50 publications (research articles in scientific journals, chapters, and 12 books).

James V. Cireddu[1]*, Jasmine A Clough[2]

[1]Associate Clinical Professor at Case Western University, United States of America
[2]Hiram College/Case Western Reserve, United States

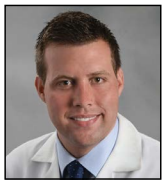
VPExam in heart failure innovating virtual cardiac care

Telehealth is a growing field of importance, but the loss of comprehensive physical exam data creates barriers to managing complex heart failure patients. Innovative digital tools such as VPExam virtual care combine augmented reality guidance of video acquisitions with Bluetooth stethoscopes and single lead ECG to improve diagnostic accuracy by assessing volume status, cardiopulmonary auscultation, detection of arrythmias, and providing structured data including vitals, medication reconciliation, and labs. VPExam intervention has been shown to significantly improve the outcomes of high-risk heart failure patients discharged to skilled nursing facilities and home care. VPExam QI revealed timely reliable cardiology consultation for follow up of heart failure hospitalization and urgent consultations created moderate significance modification in clinical management in 84% of encounters, while being associated with a 40% relative risk reduction in 30-day hospital readmission rate and a 56% relative risk reduction in 30-day mortality rate. This abstract summarizes challenges to cardiac transitions of care as well as the evolution of cardiac virtual care with actionable physical exam data to reduce readmissions and mortality.

Audience Take Away Notes

- Learn about advances in virtual care and augmented reality for heart failure management
- Develop decentralized heart failure management programs for home care and skilled nursing facilities
- VPExam research can expand research and teaching of physical examination data in academic medical centers
- VPExam Virtual Care is a practical solution to expanding guideline directed medical therapy for heart failure patients
- VPExam improves the accuracy and provides new information to assist in optimal cardiac care to underserved communities

Biography



James V. Cireddu MD, FACC is Medical Director of Harrington Heart and Vascular Institute of University Hospitals of Cleveland Regional Medical Centers and Clinical Associate Professor of Medicine at Case Western Reserve University. He is an invasive cardiologist, physician scientist, and founder of TeleHealth Care Solutions developing innovative virtual care tools. Dr. Cireddu has received several National Science Foundation grants to fund development and research on VPExam Virtual Care.

Biography



Jasmine A Clough is a Bachelor of Arts in Biomedical Humanities candidate at Hiram College. Ms. Clough is a research assistant at Case Western Reserve and TeleHealth Care Solutions LLC. Ms. Clough has contributed to research and training of the VPExam Virtual Care system focused on optimization of heart failure transitions of care especially for underserved communities in skilled nursing facilities and homebound patients served by home care agencies. Ms. Clough supports Dr. James Cireddu MD's digital health lab in the areas of data collection, organization, and the creation of digital training materials for medical professionals and patients.



Jamuna Rani. A[1]*, P. A. Hariharan[2]

[1]Biochemistry, Sree Balaji Medical College & Hospitals, Chennai, Tamil Nadu, India

[2]MBBS Student, Sree Balaji Medical College & Hospitals, Chennai, Tamil Nadu, India

Efficacy of yoga as a health promotion lifestyle method to reduce stress among medical students - a cross sectional study in the scope of preventive cardiology

Management of stress by yogic practices like surya namaskar, pranayama and meditation. Medical education includes the strenuous course load and hectic schedule, most students have a lack of time to take care of health and relaxation techniques. Yoga is gaining prominence in improving mental health and quality of life and in the treatment of a number of psychiatric and psychosomatic disorders. Thus, practice of yoga not only reduces basal anxiety levels it also promotes promote self-awareness, self-reflection, and self-care in medical students. Practice of yoga needs just a mat and minimum 15 minutes. Moreover, it could be done anywhere. The main aim of this study is to reveal the prevalence of stress among medical students and effect of yoga in reducing stress. Cross sectional study is the study design used in a group of 100 students for a period of 6 weeks.

In our study we used Hatha yoga. As designed by the hatha yoga instructor, different asana were demonstrated and students were taught. The asanas which were taught by the Hatha yoga instructor for each session are surya namaskar or (sun salutation), pranayama (nadi shodhana)- alternative nostril breathing, marjariasana (cat pose), vrikshasana (tree pose), ustrasana (camel posture), janu sirshasana (head to knee pose), shavasana, dhanurasana (bow pose), paschimottanasana, jathara parivartanasana, setu bandha sarvangasana. These asanas aids lymphatic and venous returns back to circulation, decrease in heart rate respiratory rate and blood pressure. Practice of pranayama daily after a time period, he will develop a habit of slow and deep breathing unconsciously throughout the day. By this way, there will be an increase in availability of oxygen to tissue not only during pranayama but also throughout the day.

A questionnaire was circulated to students to assess stress levels before and after completing the 6 weeks of yoga sessions in order to register the feelings and thoughts of the students. Short-term study through which the grades of stress is assessed by perceived stress scale and the individual score is obtained. Data which is obtained was statistically analysed by doing paired t-Test presented in microsoft excel. By comparison of perceived stress score of study participants, taken before starting and after completion of the yoga session we found p-value (<0.001) which is less than 0.05. We found difference in overall mean of perceived stress score with p-value of (<0.001), consistent with our hypothesis that there is reduction in stress of the students after practicing yoga.

Since the period of practicing yoga is of 6weeks we can see significant reduction in the perceived stress score of the students, if the period of practicing yoga is increased further, we will be able to appreciate more difference in the Perceived Stress Score of the students. A whatsapp group was constituted to motivate and to follow up the practice of yogasasnas taught to the students. This Cross-Sectional study is funded by Indian Council of Medical Research-Short Term Studentship (Reference no: 2020-09832).

Biography

Professor Dr. A. Jamuna Rani did her Post Graduation in Medical Biochemistry from KMC Manipal. She did FAIMER in Inter Professional education. 18 plus years of experience in Teaching Biochemistry for UG and PG Students at Sree Balaji Medical College and Hospital. She has published 20 research papers; has to her credit publication in the “Medical Teacher”. Won awards presenting paper on “Alternate Teaching Learning methods –A welcome idea among students” at National Medical Education conference at JIPMER Pondicherry. “Lending an ear to Biochemistry –The concept of Audio Book” at National Academic Leadership conference at PSG Medical & research Institute, Coimbatore.



Joao Rafael Rocha da Silva*, Mariana de Oliveira
Connect Life Rehabilitation and Performance, Ubatuba, Sao Paulo, Brazil

Factors that impact adherence to physical exercise in individuals with chronic pain

Chronic pain is defined as persistent pain for more than three months and can be classified as primary with no known etiology, or secondary pertinent to a pathological process and specific clinical diagnosis. In previous studies, we observed that it directly impacts cardiac rehabilitation, and adherence to physical exercise, significantly increasing disability and mortality in the population. We also observed that individuals with chronic pain present patterns of changes in motor control and kinesiophobia, with chronic low back pain and knee osteoarthritis being the most frequent causes of disability, directly impacting adherence to physical exercise. Despite the high relevance of studies that address the topic of motor control, its understanding in clinical practice still appears to be unclear. Experienced authors recently published a model for evaluating and optimizing motor control for individuals with chronic pain, demonstrating a variety of neurofunctional and musculoskeletal changes, which should be considered when inserting rehabilitation protocols for these individuals. The literature is abundant in studies that seek to understand which are the best exercises for treating pain, but inconsistent as to which modality is best, which is why we seek to understand and first define what are the factors that impact these individuals' adherence to exercise.

Audience Take Away Notes

- Know how to evaluate and understand dysfunctional changes in motor control in individuals with chronic pain
- Chronic low back pain and knee osteoarthritis is a common pathology in clinical practice and directly impacts the rehabilitation of these patients
- Yes, certainly this research that other faculty could use to expand their research or teaching
- Yes, certainly this will provide a practical solution to a problem that could simplify or make a designer's job more efficient
- Yes, certainly it will improve the accuracy of a design, or provide new information to assist in a design problem

Biography

Pt. Joao Rafael Rocha da Silva has been a clinical physiotherapist for over 15 years, with a postgraduate degree in rehabilitation applied to sport from the Department of Orthopedics and Traumatology at the Escola Paulista de Medicina CETE-UNIFESP, also having a postgraduate degree in Improvement in assessment and interdisciplinary treatment in Pain at the Hospital das Clinicas of the Faculty of Medicine of the University of São Paulo HC-FMUSP. He recently published five studies related to the treatment of Pain, which were presented at more than five international conferences and congresses. Scientific reviewer for international journals.



Lusine Harutyunyan
Glendale Cardiology Adventist Health Los Angeles, CA, United States

Multidisciplinary approach to cardiovascular patient

Importance on multidisciplinary approach to cardiovascular patients-specifically ASCVD and CHF groups. Financial and socioeconomic burden of cardiovascular disease and ways to improve patient outcomes and patient satisfaction. Will discuss ways to standardize medical care. ACC/AHA/ESC and CCS guidelines to reduce hospitalizations, all-cause mortality and decrease healthcare costs. Different models of achieving success in managing cardiac patients.

Goal is to implement coordinated comprehensive disease and comorbidity management with consulting services across variety of cardiac conditions.

Clinicians, hospitals and more importantly patients have a lot to gain through reduction of cardiovascular care variation. Through cost reduction, improvements in workflow efficiency and evidence-based standardization of care, we can create more affordable and sustainable health care with better outcomes.

Audience Take Away Notes

- Implementing multidisciplinary management of complex cardiac patient to each practice
- Reduce hospitalizations/medical costs and improve patient satisfaction
- Understanding the complex nature of cardiovascular patients and ways to assist them will improve quality of care and patient outcomes in different settings of medical care

Biography

Lusine Harutyunyan, PA-C, studied at Yerevan State Medical University, then continued her studies at Charles R Drew University in Los Angeles, and obtained her BS in Health Science. Has been practicing in Cardiology field since 2008 in different healthcare settings. Member of ACC and certified in Cardiovascular knowledge by ACC. Her special interest is in preventive cardiology and patient education.



Maria Borrell

Cardiovascular Program ICCC, Sant Pau Institute for Biomedical Research (IIB-Sant Pau), Barcelona, Spain

PCSK9 inhibitors beyond cholesterol regulation

Atherosclerosis, the leading cause of cardiovascular diseases, is driven by high blood cholesterol levels and chronic inflammation. The disruption of the hepatic interaction between Proprotein Convertase Subtilisin/Kexin 9 (PCSK9) and Low-Density Lipoprotein Receptor (LDLR) downregulates blood cholesterol levels and reduces cardiovascular events. Recent data suggest that other members of the LDLR superfamily may be targets of PCSK9. In this presentation I will show that LDLR-Related Protein 5 (LRP5) is a PCSK9 target, and both proteins participate in foam cell formation and hence, in the mechanism of lipid accumulation and atherosclerotic plaque formation.

I will first show that LRP5 is needed for macrophage lipid uptake since LRP5-silenced macrophages have less intracellular cholesterol accumulation. Immunoprecipitation experiments will show that LRP5 forms a complex with PCSK9 in lipid-loaded macrophages opening the possibility that PCSK9 induces lysosomal LRP5 degradation in a similar manner than it does with LDLR. We have also studied the role of PCSK9 and LRP5 in the inflammatory response by TLR4/NFkB signaling pathway and show that PCSK9 gene interference decreases inflammation supporting a role for PCSK9 as an inflammatory mediator in atherosclerosis. We then validated our results in an in vivo mice model. We analyzed the differential expression of cholesterol related genes and proteins including LRP5, PCSK9, VLDLR, LRP6, LRP2 and LRP1 in Wildtype (Wt) and LRP5 knock-out ($Lrp5^{-/-}$) mice fed a Normocholesterolemic (NC) or a Hypercholesterolemic (HC) diet. lipid uptake was studied in liver resident cells (HepG2) and in liver fat storing cells (hepatic stellate cells) with and without LRP5 and PCSK9. Results show that cholesterol accumulates in livers of Wt and $Lrp5^{-/-}$ mice. This accumulation can be explained by the increased expression of LRP receptors in HC Wt mice or scavenger receptors in HC $Lrp5^{-/-}$ mice. More importantly, PCSK9 and LRP5 bind intracellularly in fat storing liver cells but not in structural liver cells and both proteins are needed for lipid uptake.

Audience Take Away Notes

- They will learn new roles of PCSK9
- PCSK9 inhibitors are being used worldwide and are expected to increase their sales in the next years. However the roles of PCSK9 beyond lipid lowering are vastly unknown. In this presentation the audience will learn new roles of PCSK9 to be taken into account when prescribing/taking PCSK9 inhibitors

Biography

Dr. Borrell is a senior investigator in the Cardiovascular Program at the Hospital de la Santa Creu i Sant Pau, Barcelona. Prior appointments include a postdoctoral position in the Neurology Department of the Curie Institut, Paris, France studying Huntington's disease. She leads a project based in lipoprotein receptors role in cholesterol metabolism. In the recent years she has been developing a project that analyses the function of PCSK9 beyond its canonical function in cholesterol lowering. These results have been published in different journals including EHJ, BRIC or CVR and lead to the concession of projects financed by both, the government and the industry.



Marina A. Chichkova[1]*, Svetlana A. Alexandrova[2]

[1]Federal State Budgetary Institution "Clinical Hospital No 1" of the Presidential Administration of the Russian Federation, Russia
[2]A.N.Bakulev Center for cardiovascular surgery of the Russian Ministry of Health, Head of the MRI Department, Sinior researcher, Russia

Acute myocardial infarction as a complication of acute myocarditis against the background of coronavirus infection COVID-19

A new coronavirus infection identified by the World Health Organization Committee as COVID-19 ("Coronavirus disease 2019") with the official name of the causative agent of infection – SARS-CoV-2.

Some patients develop hypercoagulation syndrome with thrombosis and thromboembolism, and other organs and systems, including the myocardium, are also affected. Myocardial lesions are accompanied by the development of supraventricular and ventricular arrhythmias, transient and persistent heart blockages. The development of tachyarrhythmias and blockades is accompanied by an increase in hypercoagulation activity of the blood with the possibility of developing type 2 myocardial infarction.

The report presents a clinical case of patient K, 58 years old, with complex cardiac arrhythmias and diagnosed myocardial infarction, resistant to drug therapy, without the possibility of endovascular treatment of myocardial infarction due to the small diameter of the infarct-related artery.

My report on the successful diagnosis and treatment of this patient, who was diagnosed with acute type 2 myocardial infarction as a complication of acute myocarditis against the background of COVID-19 coronavirus infection using angiocoronarography and MRI of the heart. Mechanisms were identified, including factors of hypercoagulation activity, thrombosis of the posterolateral branch of the right coronary artery, toxic and viral myocardial damage according to magnetic resonance therapy. The revealed transient blockade of the 2nd degree, polytopic polymorphic, group periods, ventricular extrasystoles, paroxysmal form of atrial fibrillation, which are a manifestation of covid-myocarditis, served as the basis for the development of coronary artery thrombosis with the occurrence of type 2 infarction, confirmed by clinical, laboratory and instrumental research methods (selective coronary angiography, magnetic resonance therapy, Holter monitoring. The patient received comprehensive treatment with a positive effect. She was discharged from the hospital with positive dynamics and improvement in her condition without complications.

Audience Take Away Notes

- If patients have complex cardiac arrhythmias after a coronavirus infection, it is necessary to perform an MRI of the heart with contrast to exclude the development of myocarditis
- The use of radiofrequency ablation for the treatment of cardiac arrhythmias in such patients is possible only after the completion of the process of inflammation in the myocardium
- Often, when diagnosing myocarditis after a coronavirus infection, and timely medical treatment of the inflammatory process in the myocardium and cardiac arrhythmia make it possible to completely cure life-threatening and complex cardiac arrhythmias without the need for radiofrequency ablation
- Teachers can use our experience and research results to expand their research or teaching
- Treatment of type 2 thrombotic infarction consists primarily in conducting active anticoagulant and disaggregation therapy with the control of the D-dimer and all coagulating and anticoagulation factors of the blood

Biography

Marina A. Chichkova, In 2005 has completed her PhD at the at the National Medical Research Center of Cardiovascular Surgery. Since 2018 has been a professor at the Department of Cardiology of the Central Medical Academy of the Presidential Administration of RF. She is the chief physician of the Cardiological Center. She is the author of 18 Patents for innovations, 4 monographs, 17 educational tutorial. Awarded a Silver and a Bronze Diploma of the International Championship (International Academy of Sciences and Higher Education, London UK 2012). She has published over 300 articles, has been serving as an of 4 editorial boards member.



Mengyi Liu*, Zhongchen Li, Weichun Wu, Hao Wang
Chinese Academy of Medical Sciences, Beijing, China

Association between transthoracic echocardiography monitoring indicators and the incidence of postoperative acute kidney injury in coronary artery bypass grafting

Background: Acute kidney injury (AKI) is a common complication following coronary artery bypass grafting (CABG) surgery, with an incidence of 30-60%, significantly impacting both short-term and long-term mortality. In patients undergoing CABG, severe multivessel coronary artery disease or myocardial infarction often leads to cardiac capacity and hemodynamic abnormalities, potentially contributing to postoperative AKI. However, the specific nature and extent of these contributions are not well understood. This study investigates the relationship between non-invasive, easily obtainable transthoracic echocardiographic parameters—reflecting cardiac capacity and hemodynamic status—and the risk of AKI after CABG.

Methods: The occurrence of AKI was determined by KDIGO criteria based on creatinine levels. We analyzed 4,568 patients from a large cohort undergoing CABG (with or without valve surgery), excluding those with preoperative renal insufficiency. All subjects underwent a TTE within 7 days prior to surgery. The study explored the association between echocardiographic parameters, such as tricuspid annular plane systolic excursion (TAPSE), cardiac index, relative wall thickness (RWT), calculated as posterior wall thickness indexed to left ventricular internal diameter at end-diastole, and the incidence of postoperative AKI. A multivariable logistic regression model was used, incorporating both established and significant univariate predictors of AKI.

Results: Of the 4568 participants, 2169 (47.48%) developed AKI, with 2051 (44.9%) experiencing Stage 1 AKI and 118 (2.6%) suffering from Stage 2 or 3 AKI. Multivariable logistic regression analysis, after extensive adjustment for confounding factors, revealed significant differences in TEE parameters between AKI and non-AKI patients. Notably, a significant reduction in TAPSE was consistently observed across all stages of AKI (adjusted Odds Ratio [aOR]: 1.04, 95% Confidence Interval [CI]: 1.02-1.10, per millimeter decrease). Moreover, RWT showed a significant association with AKI in Stage 1 (aOR: 1.05, 95% CI: 1.03–1.10, per 0.1 increase) but not in Stages 2 and 3. Other echocardiographic measurements, such as cardiac index and left ventricular diastolic dysfunction grade, did not demonstrate significant differences. These findings were consistent whether CABG was performed with or without concomitant valve surgery. Including TAPSE and RWT significantly improved AKI prediction (net reclassification improvement: 0.19,95%CI: 0.08-0.30) beyond basic models derived from other baseline factors.

Conclusion: We found that preoperative TTE measurements of TAPSE and RWT were independently associated with AKI following CABG, with RWT being a novel finding in relation to AKI. Incorporating TAPSE and RWT significantly improved AKI prediction based on other preoperative factors. This can aid in predicting AKI and identifying which patients may benefit from preventive treatments.

Audience Take Away Notes

From this presentation, the audience will learn:

- Preoperative TTE measurements of TAPSE and RWT are independently associated with the risk of AKI following CABG, enhancing AKI prediction beyond traditional preoperative factors
- RWT has emerged as a significant predictor of AKI, marking our novel discovery
- Medical professionals can incorporate TAPSE and RWT measurements into preoperative assessments to pinpoint patients at elevated risk for AKI
- Researchers are encouraged to delve into the underlying mechanisms linking TAPSE and RWT with AKI, possibly revealing new therapeutic avenues

Biography

Mengyi Liu is currently pursuing her PhD in Ultrasonic Medicine at Fuwai Hospital, National Center for Cardiovascular Disease, Chinese Academy of Medical Sciences, and Peking Union Medical College. Her research interests include the ultrasonic diagnosis and treatment of common cardiovascular diseases.



Mengyi Liu*, Zhongchen Li, Weichun Wu, Hao Wang
Chinese Academy of Medical Sciences, Beijing, China

Preoperative transthoracic echocardiography to predict postoperative atrial fibrillation following coronary artery bypass grafting

Background: Postoperative atrial fibrillation (POAF) is the most common complication following coronary artery bypass grafting (CABG), which increases the risk of stroke and mortality, prolongs the length of hospital stays, and leads to higher healthcare costs. Structural changes in the atria and ventricles, such as myocardial fibrosis and alterations in mechanical function, constitute one of the crucial preoperative substrates for the development of POAF. However, the potential of transthoracic echocardiography (TTE)—an easily accessible modality for assessing cardiac structural changes—to predict POAF has not been adequately explored. This study aims to elucidate the predictive role of preoperative TTE for POAF after CABG, utilizing data from a large observational cohort.

Methods: A total of 3879 participants undergoing isolated coronary artery bypass grafting, with TTE performed within 7 days before surgery, were consecutively enrolled. The analysis utilized the final preoperative TTE findings. POAF was defined as occurring within 7 days post-surgery. We explored the relationship between POAF and accessible TTE parameters reflecting structural and functional aspects of the atria and ventricles during systolic and diastolic phases.

Results: Of the 3879 participants, 1047 (27.0%) developed POAF. After extensive adjustment for confounding factors, multivariable logistic regression analysis revealed significant differences between patients with and without POAF. Specifically, in terms of left ventricular size and function parameters, a Left ventricle diastolic dysfunction grade (DFG) of ≥1 compared to grade 0 was significantly associated with an increased occurrence of POAF (adjusted Odds Ratio [aOR]: 2.75, 95% Confidence Interval [CI]: 1.53-5.29, $p<0.001$). Additionally, a significantly larger left atrial anteroposterior dimension (aOR: 1.99, 95%CI: 1.14-3.38, $p<0.001$) was observed in patients with POAF, while right atrial and ventricular parameters showed no significant difference. Furthermore, the Transthoracic Echocardiographic Index established through logistic regression could significantly enhance the predictive value of clinical features for POAF, as evidenced by improvements in Net Reclassification Improvement (0.17, 95%CI: 0.07–0.32, $p<0.001$) and Integrated Discrimination Improvement (0.06, 95%CI: 0.01–0.18, $p<0.001$).

Conclusion: Baseline preoperative left ventricular diastolic dysfunction and left atrial size, as measured by TTE, are independently associated with POAF. As simple, accessible, and cost-effective parameters, focusing on TTE values before CABG surgery aids in predicting POAF and identifying patients who may benefit from preventive treatments.

Audience Take Away Notes

From this presentation, the audience will learn:

- The independent association of preoperative baseline left ventricular diastolic dysfunction and left atrial size, as measured by TTE, with the risk of POAF following CABG
- The significance of simple, accessible, and cost-effective preoperative TTE measurements in identifying

patients at risk for POAF who might benefit from preventive interventions

- Medical professionals can integrate preoperative TTE assessments into their evaluation protocols for patients undergoing CABG to identify those at higher risk for POAF. This targeted approach allows for the implementation of preemptive measures, potentially reducing POAF incidence and its associated complications. Additionally, researchers can use the Transthoracic Echocardiographic Index as a tool in further studies to refine risk stratification models for POAF

Biography

Mengyi Liu is currently pursuing her PhD in Ultrasonic Medicine at Fuwai Hospital, National Center for Cardiovascular Disease, Chinese Academy of Medical Sciences, and Peking Union Medical College. Her research interests include the ultrasonic diagnosis and treatment of common cardiovascular diseases.



Merab Beraia
Tbilisi State University, Georgia

Erythrocytes and distribution of the information in the human body

At the beginning of blood flow, Red Blood Cells (RBCs) align in the central plane of the vessels. In capillaries, RBCs change from a biconcave disk to a parachute shape and as blood moves from the arterial to the venous end, hemoglobin in erythrocytes alters magnetic susceptibility. In about 0.6-0.8 seconds, oxygen displaces from RBCs by diffusion. This study explores these processes' fundamentals and interconnections.

The blood of 35 different healthy individuals was carried out. The research examined magnetic field induction in ferromagnetic toroids formed by AC with a square wave signal in the primary coil and induction of the AC in the secondary coil-a tube filled with blood. Discusses the impact of RBC geometry, and hemoglobin allosteric transitions on electric signal generation for the body cell metabolic activity.

The findings indicate that the AC field, originating from the heart's rotational dipole, can generate a magnetic field in RBCs facilitating the allosteric transformations of hemoglobin. Hemoglobin's thermoelastic expansion and magnetostriction cause biconcave membrane oscillations at ultrasound frequencies. The forming electroacoustic wave rotates the charges at the cell z-potential area, aids RBC migration into the flow plane, and boosts substances' trans capillary diffusion.

Between the oscillating RBCs, an electroacoustic standing wave arises, which coincides with the wavenumber of the infrared light, penetrating externally. By the synergic influence on the hemoglobin, in capillaries the RBC membrane creates a temporally frequency-modulated wave, carrying resonance molecular frequencies, regulating biochemical processes in and outside the body cells.

Biography

Merab Beraia completed his Medical Doctor degree in Internal Medicine at Tbilisi State Medical University in 1986. He obtained a Diploma in Neurology from the Institute of Clinical and Experimental Neurology in Tbilisi, Georgia, and later a postgraduate diploma in Radiology from the University of Graz, Austria. Beraia started his career at The Institute of Clinical Medicine in Tbilisi, Republic of Georgia, and continues his research there. He earned his PhD in 1998 and is currently working at the Todua Clinic in Tbilisi. He has published over 55 research articles and has been recognized for his work with the Ivane Tarkhnishvili Laureate Diploma from the National Academy of Georgia in 2007 and a laureate diploma from the National Academy. He is a Member of the European Society of Radiology, European Society of Atherosclerosis, and Georgian Society of Radiology.



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Nisty Heart Centre, Kalaburagi, Karnataka, India

The clinical profile of myocardial bridge, a study of 25 cases from India

Introduction: Myocardial bridging is congenital coronary anomaly in which a segment of an epicardial coronary artery takes a tunnelled course under a bridge of the myocardium. This segment is compressed during systole, resulting in the so-called "milking effect" at coronary angiography. The Left Anterior Descending (LAD) is the most commonly involved artery. Porstmann and Iwig were the first to demonstrate this effect while carrying out Coronary Angiography (CAG) in 1960.

Methodology: The aim of this study was mostly to assess the profile of patients with the myocardial bridge on coronary angiography and to evaluate its association with atherosclerosis and other conditions in the coronary artery at our centre located in Kalaburagi, India. In this study, evaluation was done of the angiographic reports of the patients, and the prevalence of myocardial bridge was studied in details with the various association.

Results: Out of all 25 patients, 84% (21 patients) were males, and 16% (04 patients) were females. Among all the mean age of the patients having myocardial bridge was 48.96 years. All the patients had chest pain as common sympotom.16% (04 patients) had diabetes and hypertension, and 20% (05 patients) were found to be smoker. Troponin I levels were elevated in 20% (05 patients) All the patients had myocardial bridge in LAD artery.24% (06 patients) were associated with acute coronary syndromes, another 24% (06 patients) were associated with plaquing and 28% (07 patients) had flow limiting stenosis in coronary arteries. 08% (02 patients) had slow flow associated in LAD and RCA coronary artery.

Conclusion: Myocardial bridge is an incidental finding on coronary angiogram and which can affect the quality life of a individual and can cause adverse cardiac events rarely. Prompt and early diagnosis could be beneficial for improving quality of life of an individual and occasionally mimic with acute coronary syndromes.

Audience Take Away Notes

- Audience will know about the clinical profile of myocardial bridging
- Audience will know the differential diagnosis of myocardial bridging which could even beacute coronary syndrome
- Myocardial bridging is a less studied and yet a common phenomenon in field of cardiology

Biography

Dr. Nidhish Nisty is consultant Physician and Administrator at Nisty Heart Centre, Kalaburagi. Studied MBBS and M.D Internal Medicine at MRMC, Kalaburagi. He has secured highest grades at college in Internal Medicine and has been awarded gold medal in MBBS. He is also co-author for many abstracts which were selected at EuroPCR at paris 2020 during his post-graduation and also at IHC Japan 2023.He has also various presented posters in India. He has travelled to 10 countries.



Oleksii Gurtovenko*, Popov Volodymyr, Mazur Andriy
Amosov National Institute of cardiovascular surgery, Kiev, Ukraine

Pre-and postcondition of coronary artery and myocardium for combined mitral-aortic-tricuspid valve correction

Objective: To present analysis of pharmacological supporting of conditions of coronary artery and myocardium (pre and postcondition) during combined Mitral-Aortic Valve Replacement (MVAR) + TV`s plasty.

Materials and Methods: During 2015-2022 y 203 patients (pts) with isolated pathology of mitral valve disease were operated by MVAR + TV`s plasty in institute. There were 91 (44,8%) males, 112 (55,2%) females. Average age was 64,4±8,7 yy. NYHA class in all group were followings: III class – 77 (37,9%), IV class – 126 (62,1%) pts. Concomitant procedures: TV`s plasty (n=9), LA`s plasty (n=41), Maze (n=29). Pharmacological Supporting of Conditions of Coronary Artery and Myocardium (PSCCAM) was performed by applying during 20 minutes of 100 ml solution with following drugs: papaverine 40mg + verapamil 5mg + ATP 50,0 mg.

All pts were divided at 3 groups: Group A - PSCCAM was applied before starting of CPB - 37 pts; group B - PSCCAM was applied before starting of CPB and the same dose was used after declamping of aorta - 39 pts; group C - only MVAR without precondition 127 pts.

Systemic hypothermia 32-34 C, cardiopulmonary bypass, retrograde cardioplegic solution (custadiol) (in dose 20 ml/kg) were occured in all pts. Average time of improvement of cardioplegia solution was 21,2±3,9 minutes. Average cross-clamping time (min) were: 69,3±8,1 and reperfusion time - 29,1±4,5. Absence of using blood product in 48,5%.

Results: There weren`t any pts of hospital mortality. Average doses of dobutamin (1,8±0,6 mcrg/min/kg) were marked (hours) for: Group A - 24,8±7,2; group B - 19,1±5,7; group C - 39,5±5,4 (p <0,05). Average level of MB KFK (U/L) at 2-td postoperative day were occured for: Group A - 56,3±7,2; group B - 53,4±6,8; group C - 61,1±9,3 (p<0,05). Duration of stay on artificial lung ventilation (hours) were: Group A - 7,1±0,9; group B - 6,9±0,7; group C - 7,4±0,5 (p>0,05). Average time of staying in intensive care unit (hours) were: Group A - 47,2±5,6, group B - 43,3±6,5, group C - 48,7±5,7 (p <0,05).

Conclusion: Both variances of pharmacologic supporting of conditions of coronary artery and myocardium (group A,B) had improved myocardial protection compare with group C (p<0,05).

Biography

Oleksii Gurtovenko is an anesthesiologist and researcher at the department of surgery of acquired heart disease Amosov National Institute of Cardiovascular Surgery. Kyiv, Ukraine



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Myocardial protection for combined mitral-aortic-tricuspid valve correction: Is retrograde applying of cardioplegia is better?

Objective: To present analysis of retrograde crystalloid cardioplegia during combined valve pathology of mitral-aortic-tricuspid valve disease (matvd).

Materials and Methods: During 2009-2023 yy 529 patients (pts) with (MATVD) were operated in Institute by CPB. There were 243 (45,9%) males, 286 (54,1%) females. Average age was 60,4±8,2 yy. NYHA class in all group were followings: II class – 28 (5,4%), III class – 229 (43,3%), IV class – 272 (51,3%) pts. Double valve replacement+ TV`s plasty (n=389), MVR + AV`s plasty + TV`s plasty (n=38), MAR + MV`s plasty + TV`s plasty (n=102). Concomitant procedures: resection of left atrium`s auriculum (n=155), LA`s plasty (n=67), Maze (n=92). The following applying of cardioplegia (custadiol) were performed by: Antegrade 84 (15,8%) pts (group A), ante-retrograde 66 (12,5%) pts (group B), retrograde – 379 (71,7%) pts (group C) ways.

Systemic hypothermia 32-34 C, cardiopulmonary bypass, retrograde cardioplegic solution (custadiol) (in dose 20 ml/kg) + external cooling of myocardium were occured in all pts. Average time of improvement of cardioplegia solution (min) were for: Group A - 9,8±0,9, group B - 12,8±1,5, group C - 20,2±2,7 ($p<0,05$). Average cross-clamping time (min) were for: Group A - 69,8±7,9, group B - 64,8±7,5, group C - 52,7±6,4 ($p<0,05$) and reperfusion time (min) was for group A - 19,8±3,3, group B - 18,6±3,1, group C - 16,1±2,5($p >0,05$).

Results: Hospital mortality was for group A 3,5% (n=3/84)., group B - 3,0% (n=2/66)., group C - 1,1% (n=4/379) ($p<0,05$). Average doses of dobutamin (1,0-3,0 mcrg/min/kg) were marked for: group A - 54,8±7,2 hours, group B - 49,1±5,7 hours, group C - 41,5±5,4 hours ($p <0,05$). Average level of MB KFK (U/L) at 2-td postoperative day were occured for: Group A - 87,3±9,1, group B - 79,4±8,6, group C - 69,1±7,4 ($p <0,05$). Duration of stay on artificial lung ventilation (hours) were: Group A - 8,7±0,9, group B - 8,1±0,7, group C - 7,5±0,5 ($p>0,05$). Average time of staying in intensive care unit (hours) were: Group A - 59,2±7,5, group B - 53,3±6,4, group C - 45,7±5,3 ($p <0,05$). Absence of applying donor blood product during all postoperative period for group A - 65,5%, group B - 68,3%, group C - 72,6% ($p<0,05$).

Conclusion: Improved myocardial protection in cases with MATVD by using retrograde crystalloid cardioplegic solution (custadiol) (group C) lead to better results than in group A and B ($p<0,05$).

Biography

Oleksii Gurtovenko is an anesthesiologist and researcher at the department of surgery of acquired heart disease Amosov National Institute of Cardiovascular Surgery. Kyiv, Ukraine



Olexandr O. Bolshak*, Volodymyr V. Popov
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Wrap or not to wrap of ascending aorta during surgical treatment of its poststenotic aneurysms is it the better option?

Aim: To research possibilities of surgical treatment of poststenotic aneurysms of ascending aorta (PAAA) by different methods.

Methods: During 2000-2023 yy 454 Patients (pts) with Aortic Stenoses (AS) and PAAA were consecutively operated in Institute. The average age of pts was 58,2±9,1 (18 –73) yy. Males 304 (67,0%), females 150 (33,0%). At all group 21 (4,6 %) pts were in II NYHA class, 282 (62,1%) pts were in III NYHA class and 131 (33,3%) pts in IV. The following operations were performed: Aortic Valve Replacement (AVR) + Wrapping Tape Operation (WTO) of AA – 277 pts (group A), replacement of AA by vascular graft (n=177): Benthal's (n= 156) and Wheat's (n= 21) operations (group B). In all cases in group A after AVR nylon tape (diameter 1 cm) was wrapped on AA from the basement of noncoronary cusp by 7-9 tours and fixated between them in proximal and distal part of AA and resection of AA in incision`s area. All operations were performed with CPB, moderate hypothermia (27 - 32 C), combined retro-antegrade crystalloid cardioplegia (mainly Custadiol).

Results: Hospital mortality were 0,3% in group A, 2,9% in group B ($p < 0.05$). Cross-clamping time (min) were: (group A) - 71,5±12,4, (group B - 124,9±19,8 ($p < 0.05$).

During remote period (average 15,4±7,6 yy) we followed-up 349 pts. Actuarial survival at 10 years after operation was occured in group A – 81,5% (n=232), in group B – 53,8% (n= 117) ($p<0.05$). Echo examination of diameter of AA for group A (cm): Preoperative (PRE) 4,5±0,5, postoperative (POST) (6–7 days) 3,4±0,6, Remote Period (RP) 3,5±0,4; for group B: Preoperative 5,6±0,7, postoperative – 3,3±0,4, remote period 3,4±0,2. Reoperations (AA`s graft replacement) were absents in group A and B.

Conclusion: On the basis of our experience we recommend the expedient method of wrapping tape operation for moderate forms of AAA (diameter of AA till 5,5 cm) during AVR. Reconstruction of AA for PAAA by WTO is safe, chiper and prevents AAA at the remote period.

Biography

Olexandr O. Bolshak, is a senior researcher at the Department of Acquired Valvular Heart Diseases of Amosov National Institute of Cardiovascular Surgery (Kyiv, Ukraine), cardiosurgeon. My experience in scientific and practical work is more than 20 years.



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Mitral stenoses complicated by massive thromboses of left atrium

Objective: To analyzed main problems in surgery of Mitral Valve Diseases (MVD) complicated by Left Atrium`S Massive Thromboses (LAMT) (thromboses more than 1/3 of left atrium`s volume).

Materials and methods: 336 adult Patients (pts) with MVD complicated LAMT were consequtive operated from 01.01.1984 till 01.01.2020 yy in institute. Predominant genesis of MVD was rheumatism. Mitral stenoses was marked in all pts and all of them were in IV NYHA class. There were male 147 (43,7%) and females 189 (56,3%).The average age was 59,2±5,2 yy. Preoperative thromboembolic episodes were in 59 (17,6%) pts. Calcification of MV was in 197 (58,6%) pts. Previous closed mitral commissurotomy was occurred in 35(10,3%) pts. The following procedures were performed: MVR (n = 294) including plastic procedure on TV by De Vega (n = 35); open mitral commissurotomy (OMC) (n =42) including plastic procedure on TV (n = 7). Only mechanical valves were used. All operations were performed with CPB, moderate hypothermia, ante-retrograde crystalloid cardioplegia (custadiol). All pts was devided on 2 groups; group A (n =162) maternal thrombotic basement was removal together with all thrombotic masses out of LA, group B (n =174) maternal thrombotic basement wasn`t removal. There were used bileaflet prosthesis (Saint Jude Medical, Carbomedics, On-X, ATS) (n=140); monodisc (n=98), star-edwards (ball) (n=38), amosov`s model (hemiball) (n=18). Absence of applying donor blood product during all postoperative period was 19,5%.

Results: The Hospital Mortality (HM) at the period (1994-2014 yy) was 4,5% (n =9/198) for MVR and 0% (n = 0/29) for OMC. The reasons of deaths were: Heart failure (n=4), brain damage (thrombemboli)(only group B) (n=3), MOF (n = 1), bleeding (n=1 group A). Traumatic rupture of LA`s wall during radical removing of maternal thrombotic basement as specific complication was marked in 2,5% (n=4/162) pts. At all period of experience thromboembolic events were marked: Group A – 1,8% (n = 3/162) (lethal = 0), remote period - 3,6% (n = 5/140) (lethal -1,4%), group B – 5,8% (n = 10/174) (lethal- 3,4%), remote period - 13,3% (n = 19/142) (lethal - 9,2%) ($p < 0,05$). At all period of experience thromboembolic events were marked: MVR in 4,1 % (n= 12/294), (lethal -1,0%), remote period - 8,9% (n = 22/245) (lethal -5,7%) and during OMC 2,4% (n= 1/42), (lethal -0), remote period - 5,4% (n = 2/37) (lethal -2,7%) ($p < 0,05$). 282 (95,5% alive) pts was followed-up at the remote period (average 16,2 ± 3,1 yy).

At all period of experience thromboembolic events were marked for bileaflet prosthesis: Saint Jude - 1,5% (lethal = 0,7%), remote period - 3,6% (lethal – 0,9%), carbomedics – 4,3% (lethal - 2,7%), remote period - 6,5% (lethal - 2,2%), on-X – 2,4% (lethal = 2,3%), remote period - 4,2% (lethal - 0), group ATS (n=32 pts) – 6,2% (lethal = 3,1%), remote period - 9,3% (lethal - 6,3%) ($p < 0,05$).

Conclusion: Thromboembolic events at postoperative period is specific complicated factor for LAMT. Maternal thrombotic basement must be removed with all thrombotic masses in all pts. Mechanical valve is independent risk-factor at postoperative period except model Saint Jude.

Biography

Olexandr O. Bolshak, is a senior researcher at the Department of Acquired Valvular Heart Diseases of Amosov National Institute of Cardiovascular Surgery (Kyiv, Ukraine), cardiosurgeon. My experience in scientific and practical work is more than 20 years.



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Heart failure patients: Measuring the effectiveness of a rehabilitation program in relation to physical and mental fatigue, general health and anxiety

Exercise is an important factor of rehabilitation in heart failure patients, improving several indicators of disease prognosis and functional capacity. The aim of the present study was to examine the effect of a cardiorespiratory rehabilitation program on the physical and mental fatigue, general health and anxiety in patients suffering from heart failure. Thirty-one patients with heart failure [(M±SD) age: 67.59±7.60 years] participated in a cardiorespiratory rehabilitation program. The program included aerobic exercise on cycle ergometers and muscle strengthening for 3 months (12 weeks), 3 times/week. Before and after the program, patients' fatigue, general and mental health were assessed using the following self-reported questionnaires: a) Fatigue Assessment Scale (FAS), b) Goldberg's General Health Questionnaire (GHQ-28) and c) Spielberger's anxiety questionnaire. Data analysis showed a statistically significant tendency of reduction in social dysfunction (from 1.99±0.42 to 1.75±0.45, p=0.05), while anxiety (from 27.10±7.61 to 26.40±4.35) showed no change (p>0.05). Also, evaluating the changes in the health level after attending the program, there was a trend of improvement in physical activity and functioning with the appearance of fewer physical symptoms (from 1.38±0.43 to 1.24±0.31, p=0,13). These results show that exercise can contribute to increasing the general well-being of these patients and reducing feelings of helplessness, making them able to cope with their daily activities and tasks.

Biography

Paraskevi Theofilou is a Post Doc Researcher (2016-2018, University of Peloponnese, Department of Nursing, Sparta, Greece), Ph.D. in Health Psychology (Panteion University of Social and Political Sciences, Department of Psychology, Athens, Greece) Ph.D. in Personnel Management (University of Peloponnese, Department of Nursing, Tripoli, Greece) M.Sc. Health Services Management (Frederick University, School of Health Sciences and School of Law and Business Administration, Cyprus) M.Sc. Social exclusion, minorities and gender (Panteion University of Social and Political Sciences, Department of Sociology, Athens, Greece) Social Administration - Management of Health Services (National School of Public Administration, Athens, Greece) B.Sc. in Psychology (Panteion University of Social and Political Sciences, Department of Psychology, Athens, Greece) B.Sc. in Social Work (Technological Educational Institute of Athens, Athens, Greece).



Prabode Weebadde
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Cuffless blood pressure monitoring using multiple artificial intelligence models

In the U.S., every year, about 800,000 people die due to Cardiovascular Diseases (CVD) or diseases related to the heart and blood vessels. Of those 800,000, 650,000 deaths were related to the heart, and 150,000 were related to blood vessels. To put it in another perspective, every 33 seconds, someone dies from CVD. In addition to deaths, one in every nine American adults has been diagnosed with heart disease. Therefore, heart disease is the number one non-communicable disease the population faces. World Health Organization says 80% of premature CVD-related events are preventable by checking and controlling CVD risk factors. The most common risk of CVD is high Blood Pressure (BP) or hypertension when systolic blood pressure is over 130 mmHg and diastolic blood pressure is over 80 mmHg. One in two people has hypertension in the US, and about 46% of those who have hypertension are unaware of having hypertension. One in five with hypertension can manage it with lifestyle changes alone; others do so with medications. To detect and control hypertension, one should monitor it regularly, at least once or twice a day, in their home environment. A study found available BP monitors vary in accuracy between 4 mmHg and ten mmHg.

Having false BP measurements could lead to undesirable outcomes. For example, a 5-mmHg incorrect measurement could overestimate BP in twenty-seven million or underestimate BP in twenty-one million people in the US, leading to either unnecessary medications or neglect of treatment, resulting in risky CVD outcomes. In addition to accuracy issues, widely available BP monitors are cuff-based, and they come with many useability challenges; for instance, older adults (the most high-risk population) need help to use them properly. To address the challenges of cuff-based BP monitors, cuffless BP monitors are promoted in literature as a viable solution. However, cuffless BP monitors are not widely available in the market, and available devices are individualized by regular recalibration with a cuff-based monitor. This research aims to eliminate regular cuff-based calibration from cuffless BP monitoring with an AI model capable of measuring BP in general, which could then improve the ease of use or user experience to be a viable solution to promote broad adoption of regular BP monitoring to deliver better heart health. The proposed research includes testing multiple AI models using multiple data features extracted from Photoplethysmography (PPG), lead-1 Electrocardiogram (ECG), Body Mass Index (BMI), gender, and age.

Audience Take Away Notes

- How to PPG and ECG related to blood pressure
- How to process PPG and ECG signals
- Regulations related to blood pressure meters
- How to implement an AI/ML model
- How to test the accuracy of the AI/ML model

Biography

Prabode Weebadde is a lifelong entrepreneur who has started five startups and is a software architect with over 25 years of experience in software, hardware, and business development. One of his startups, Avidhrt Inc., aims to make cardiac care affordable through technology. He is also a doctoral student at Purdue University pursuing a Doctor of Technology doctorate. He plans to use his research on blood pressure to help reduce CVD.



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Outcomes of fenestrated versus non-fenestrated in fontan procedure: A systemic review and meta-analysis

Introduction: Numerous investigations examining fenestration in the Fontan procedure have presented inconsistent findings regarding its effectiveness in improving surgical outcomes. The objective of this meta -analysis is to contrast the early results of fenestrated versus non-fenestrated Fontan procedures.

Method: Literature search was performed using PubMed, Science Direct and Research Gate for obtaining studies comparing Fenestrated and Non-Fenestrated in Fontan Procedure, published between 1992 and 2022. The primary outcome was overall mortality. Secondary outcomes included CPB time, post-operative oxygen saturation, prolonged pleural effusion, ICU stays, hospital stay, fontan failure, and survival rate.

Results: There was a significant difference in terms of cardiopulmonary bypass (CPB) time between both groups (MD, 12.66; 95% CI, [2.87, 22.46]; p = 0.01, I2 = 36%). Significant difference was also observed for post-operative oxygen saturation between the 2 groups (MD, -3.46; 95% CI, [-5.96, 0.96]; p = 0.007, I2 = 89%). Analysis for the outcome prolonged pleural effusion revealed significant difference between two groups (OR, 0.47, 95% CI, [0.24, 0.93]; p = 0.03, I2 = 84%; Fig. 4). Analysis of ICU stay did not show a significant difference between 2 groups (MD, -0.51; 95% CI, [-0.51, 0.68]; p = 0.77, I2 = 45%). A trend of lower hospital length of stay occurrence was observed in the Fenestrated group, however no significant difference was observed (MD, -1.30, 95% CI, [-3.79, 1.18]; p = 0.05, I2 = 0%). Similar finding was revealed in term of fontan failure (OR, 0.69, 95% CI, [0.42, 1.13]; p = 0.14, I2 = 60%). Analysis of Mortality did not show a significant difference between 2 groups (OR, 1.13, 95% CI, [0.55, 2.31]; p = 0.74, I2 = 31%). Similar findings also found in Survival Rate where there was no difference between 2 groups. (OR, 1.04, 95% CI, [0.84,1.30]; p = 0.70, I2 = 0%).

Conclusion: CPB time was found longer in fenestrated group compared to non-fenestrated group. Post-operative oxygen saturation was found higher in non-fenestrated group, whereas prolonged pleural effusion was found in non-fenestrated group. There was no significant difference in terms of ICU stays, hospital stays, fontan failure, mortality and survival rate.

Keywords: Fontan Procedure; Fenestrated; Non-Fenestrated; Outcomes.

Audience Take Away Notes

The presentation would provide a comprehensive overview of the procedural outcomes about the early results of fenestrated versus non-fenestrated Fontan procedures, shedding light on the comparative effectiveness of these approaches. Here are the specific learning points and benefits the audience can expect:

- **Clinical Decision-Making:**

  The presentation will enable surgeons and clinicians to make more informed decisions regarding the selection of fenestrated or non-fenestrated Fontan procedures based on detailed comparative outcomes like CPB time, post-operative oxygen saturation, and pleural effusion

- **Research and Educational Impact:**

  The findings serve as a valuable resource for further research into Fontan procedures and provide a solid educational foundation for teaching medical students and residents about evidence-based practices in pediatric cardiac surgery

- **Improved Patient Outcomes:**

  By providing evidence-based insights into procedural outcomes, the research helps in refining surgical techniques and patient management strategies, ultimately aiming to improve patient recovery and procedure effectiveness

- **Interdisciplinary Collaboration and Policy Formulation:**

  Encourages collaboration between different medical specialists and helps healthcare administrators in formulating policies or guidelines that standardize care processes, enhancing overall healthcare delivery in pediatric cardiac surgery

Biography

Prima Abdillah Akbar pursued his medical education at the Faculty of Medicine, Muhammadiyah University of Malang, from 2009 to 2016. He is currently undergoing residency training in thoracic, cardiac, and vascular surgery at the Faculty of Medicine, Airlangga University



Qazi Naeem ur Rehman*, Huda Abdelmouti, Ying Gue, Daniel Garner

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IV iron in heart failure - A Quality Improvement Project (QIP)

Introduction: Heart failure affects more than 64 million people worldwide and causes significant morbidity and mortality. The prevalence of Iron Deficiency (ID) can reach up to 59% in patients with heart failure. ID is an independent predictor of outcomes and major contributor to exercise tolerance in heart failure. A recent Meta analysis showed that IV iron reduced the risk of composite endpoint of both heart failure admissions or cardiovascular deaths (as a result of reduction recurrent hospitalization). However, the effect of IV iron on CV, death or all-cause mortality was inconclusive. Given significant association of iron deficiency and heart failure and the effects of iron deficiency in the patients, European Society of Cardiology recommends IV iron supplementation in patients with symptomatic heart failure with ID to alleviate heart failure symptoms and improve quality of life (Class IA recommendation).

Causes of Iron Deficiency in Heart Failure: ID can be absolute, which is secondary to depletion of iron stores. Iron depletion can result from reduced intake of iron (e.g reduced oral intake and reduced absorption through duodenum (demonstrated in rat models in heart failure)) or loss of iron from the body (e.g GI bleed). ID can be functional which results from demand and supply mismatch. In this case iron is unavailable for cellular metabolism, as it is trapped within reticuloendothelial system such as inflammatory states.

QIP: European Society of Cardiology recommends IV iron replacement in heart failure with reduced ejection fraction, a quality improvement project was carried out in Arrowe Park hospital to improve compliance with guidance.

As per local hospital guidance, inclusion criteria for IV iron therapy is (must meet all)

1. NYHA class II-IV
2. LVEF <or= 45%
3. Ferritin <100 or 100-300 and TSAT <20
4. Hb < 125g/L

In the first 1st cycle of data collection, 39 patients were reviewed who were flagged with heart failure as inpatient in August 2022.

August 2022

Heart Failure (HF)	EF<50%	Screened	Eligible	Received IV Iron	Did not receive IV Iron
39	20	14	6	1(16.6%)	5 (83.4%)

Reasons for not receiving IV Iron as inpatient

- 2 patients died during admission

- No clear explanation was provided for why 3 patients did not receive IV iron

Intervention:

As a part of quality improvement project, teaching session was carried out on the departmental teaching day in cardiology department, explaining the effects of iron deficiency in heart failure and discussing the benefits of IV Iron therapy in heart failure patients. Important trials and hospital guidelines were discussed.

In the second cycle of data collection, data was collected for patients admitted to Arrowe Park Hospital, who were flagged as heart failure in April 2023 and included 38 patients.

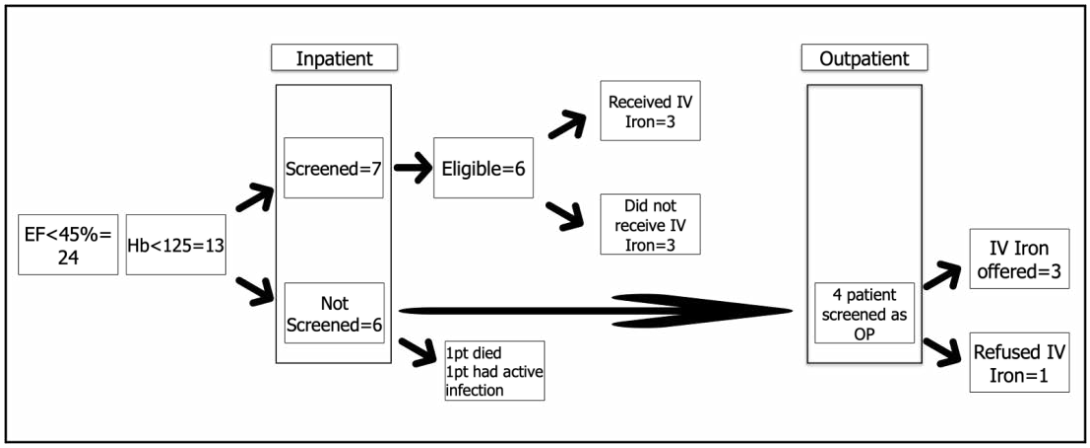
April 2023

Heart Failure (HF)	EF<45%	Hb<125	Screened	Eligible	Received IV Iron	Did not receive IV Iron
38	24	13	7	6	3 (50%)	3 (50%)

Reasons for not receiving IV Iron:

- 1 patient was screened but did not receive IV iron was referred to heart failure service. No further evidence available as heart failure service was from out of area to local hospital
- 1 patient had cancer and died after 1 month
- There was no clear explanation as to why one patient did not receive IV iron

Further analysis of data for patients with EF<45% and Hb<125 g/L



Results: All patients with heart failure had echocardiogram performed (not necessarily as inpatient) and all of them had baseline blood tests including FBC was done which was an important part of inclusion criteria.

There was improvement noted in delivering iron therapy to the inpatient cohort meeting criteria for IV iron therapy from 16.6% to 50% after first intervention but there still is room for further improvement. Heart failure service screened most of the patients who missed iron screening during admission and were discharged.

Discussion: IV iron replacement is an important part of treating co-morbidities in heart failure with reduced ejection fraction to improve quality of life and reduce recurrent hospital admission and is recommended by European Society of Cardiology. It is often overlooked in the treatment of heart failure and proves difficult to attain 100% compliance with guidance. Although there was an improvement in compliance

with guidance due to the quality improvement project, there is still room for more improvement which will be carried out in the further cycles of the quality improvement project. It was noted that IV iron was only advised by cardiology teams and further interventions are needed to update all medical specialties to further improve compliance as heart failure is treated in multiple specialties.

Recommendation: Further cycles of quality improvement project and focus on increasing awareness of guidance in acute medicine and general medicine wards as a good number of patients are treated for heart failure in these specialties. Further discussions with heart failure specialist nurses regarding implementation of advice given by specialty and creating an algorithm for IV iron therapy making it available to all medical specialties.

Audience Take Away Notes

- Audience will be updated with guidance by ESC on IV iron replacement in heart failure by ESC benefit of IV iron in heart failure
- Compliance with the guidance regarding IV iron therapy in heart failure and introducing quality improvement project to update colleagues and encourage to do similar quality improvement projects, which is a good education opportunity for cardiology units
- This presentation can we take on as spaces further teaching on optimising heart, failure therapy, and treating comorbidities improve quality of life and heart, failure patients and reduce the current hospital admissions
- Involvement of MDT team explained in this quality improvement project and heart failure service can improve the delivery of care and also improve compliance with guidance
- As mentioned in the abstract, the plan for improving compliance on IV iron therapy in heart failure and creating an algorithm in the next step to be followed by general medical team can provide information colleagues to implement these changes in their centres. Also the interventions done by our team like arranging teaching, involving heart failure specialist nurse service and further plans to arrange teaching in general medicine wards can also help colleagues implement these changes in their centres

Biography

Dr. Qazi Naeem ur Rehman studied at Ayub Medical College in Pakistan and moved to UK for training in medicine and worked at Salford Royal Hospital completed foundation competencies and entered Internal medicine training during which he worked at Leighton Hospital, Clatterbridge Cancer Hospital and Wirral University Hospital and completed MRCP. He has worked as an educational fellow in Wirral University Hospital and was involved in simulation teaching for medical students and foundation doctors. He is currently working as cardiology fellow in Wirral University Hospital.



Robert Guidoin[1], Yiming Li[2], Aisa Rassoli[3], Eric Philippe[1], Xianhao Bao[2], Daniel Chappard[4], Jiaxuan Feng[2], Zaiping Jing[2], Nasser Fatouraee[3], Ze Zhang[1]

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Donkey pericardium as a select sourcing to manufacturer percutaneous heart valves: Will decellularization guarantee the long-term durability?

Background: The donkey pericardium is considered to be a good candidate material for use in the manufacture of percutaneous heart valves based upon its thinness, its low cellularity and its undulating collagen bundles and laminates. Decellularization represents an avenue worth exploring, should its superiority to glutaraldehyde-treated pericardium be demonstrated.

Materials & Methods: Donkey pericardium for percutaneous valved stent implantation was divided into two groups and processed according to two protocols separately: regular glutaraldehyde fixation equivalent to industrial procedures to manufactured bioprostheses, and mild decellularization including freezing and thawing prior to treatment with Triton X, and sodium deoxycholate after the regular fixative step. The treated pericardia were observed using scanning electron microscopy, histology and transmission elector microscopy, tensile tests were performed by applying synchronic loading along the axial and perpendicular directions. The obtained biaxial data were then fitted into both the Gasser-Ogden-Holzapfel (GOH) material model and the Fung's anisotropic one.

Results: The microstructure of both pericardia were similar, glutaraldehyde fixation and decellularization proved to provide collagen bundles and laminates free of flaws. The latter process eliminated most of the cells; however, the structure became less open and somehow more compressed. The collagen filaments in bundles were slightly blurry in transmission electron microscopy. Based on the biaxial tensile test, anisotropy rates of the decellularized specimens were almost identical to the non0decellularized ones. Decellularized pericardium appeared stiffer, based on the greater strain energy value and the average slope of the stress-strain curves. Thus, pericardial specimens behaved as anisotropic and nonlinear tissues.

Conclusions: The decellularization procedure proved to be effective to reduce and possibly eliminate the cellularity of tissue. Mechanical and histological characteristics of the donkey pericardium do not benefit from it. It makes the tissue stiffer, which may lead to higher shear concentration during cardiac cycles and reduce its wavy microstructure. There, it appears premature to select decellularized donkey pericardium to manufacture heart valves for human implantation.

Audience Take Away Notes

- Help researchers to identify new pericardium
- Help industry to select pericardium for heart valve manufacturing
- Detailed analysis of donkey pericardium
- Comparison of two procedures in processing donkey pericardium

Biography

Robert Guidoin PhD is professor of surgery (biomaterials) at Laval University, Quebec, QC (Canada). He has made important contributions in the field of vascular and endovascular grafts, heart valves, mechanical hearts, membrane oxygenators, auditor ossicles, breast implants and intra-uterine devices. He has trained 35 MSc, 21 PhD, 11 post-doc, and 12 visiting professors. He has published more than 300 scientific papers, 24 book chapters, 2 books as co-editor, and has presented his research at numerous meetings worldwide. Robert Guidoin is an internationally leading expert in cardiovascular devices, especially those used for percutaneous techniques.



Samir Rafla
Professor of Cardiology, Alexandria University, Egypt

Management of arrhythmias in pregnancy

Most palpitations in pregnancy are benign and usually occur due to atrial or ventricular premature complexes. Careful consideration should be given to the gestation stage and the patient's hemodynamic state. In hemodynamically stable pregnant patients with acute onset of SVT, intravenous adenosine is recommended as the first-line pharmacological therapy.

In pregnant patients with symptomatic SVT without preexcitation, metoprolol, propranolol, and/or digoxin should be used as first-line options and verapamil as the second-line option for the chronic oral prophylaxis of SVT. In hemodynamically stable pregnant patients with AF or AFL with Rapid Ventricular Rates (RVR), I.V. beta-blockers are recommended as the first-line option and digoxin or verapamil, alone or in combination are recommended as second-line options for initial rate control in the absence of preexcitation. In pregnant patients with AF or AFL with persistent symptoms or RVR refractory, elective direct current cardioversion is recommended with anticoagulation as in nonpregnant patients.

In pregnant patients with AF or AFL with continued symptoms or RVR despite rate control therapy, flecainide in the absence of Structural Heart Disease (SHD) or sotalol in the absence of severe LV dysfunction is reasonable. The choice of anticoagulation, namely Low Molecular Weight Heparin (LWMH) or vitamin K antagonists (i.e. warfarin), depends on the stage of gestation. Direct Oral Anticoagulants (DOACs) are contraindicated altogether. Direct current cardioversion is recommended in pregnant patients with sustained VT and hemodynamic compromise.

In pregnant patients with idiopathic VT and hemodynamic stability, intravenous beta-blocker or adenosine for outflow tract VT and intravenous verapamil for fascicular VT are recommended as first-line options. In pregnant patients with recurrent VT refractory or with contraindications to beta-blockers who require additional antiarrhythmic drug therapy, treatment with flecainide, sotalol, or mexiletine is recommended. In pregnant and postpartum patients with asymptomatic sinus bradycardia or Mobitz type I AV block without evidence of SHD, reassurance is recommended with no need for intervention.

Biography

Professor Samir Rafla graduated from Alexandria University in June 1970. He was resident in the cardiology department then assistant lecturer then lecturer in June 1982. Spent 10 months research fellow in Cleveland clinic Ohio; in the research institute with Late Prof. R. Tarazi and in the electrophysiology department with Prof. James Maloney. Became professor of cardiology in June 1994. Then head of the cardiology department from 1/8/2004 till 30/8/2007. He was appointed in the National council for promotion of professors in cardiology and critical care starting from December 2004 for four years then extended another 4 years as assessor. He is editor in the Egyptian Heart Journal and Heart Mirror Journal. He is Fellow in the American College of Cardiology, Fellow in the European Society of Cardiology, member in EHRA (European Heart Rhythm Association), and member in European Association for Echocardiography and Imaging. Member in the steering committee of the Egyptian Cardiac Arrhythmia Association (ECRA). His main areas of interest are in electrophysiology and pacemakers, also in Echocardiography. He published over twenty abstracts and papers outside Egypt and has presented over 300 lectures / chairmanships at national and international meetings. He organized summer meetings of the ECRA group every year starting 1998, at first alone then with Professor Mostafa Nawar. Also was co organizer of the international CardioAlex conference in the years 2005 to 2007.



Sergey Suchkov[1-6]*, Noel Rose[7,8], Aleks Gabibov[11], Matt Springer[9], Harry Schroeder[10]

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Antibodies with functionality as a new generation of translational tools designed to monitor autoimmune myocarditis at clinical and subclinical stages

Catalytic Abs (catAbs) are multivalent Immunoglobulins (Igs) with a capacity to hydrolyze the Antigenic (Ag) substrate. In this sense, proteolytic Abs (Ab-proteases) represent Abs to provide proteolytic effects.

Autoimmune Myocarditis (AIM) can be defined as the autoimmune inflammatory process affecting the muscular tissues of the heart (myocardium). And then is being transformed in a stepwise manner into Dilated Cardiomyopathy (DCM). New targeted therapies for autoimmune and inflammatory diseases (including AIM) would require greater understanding of a patient or a person-at-risk to get the therapy personalized for either of those subsets, for specific biomarkers and the targets. In this sense, the identification and implementation of diagnostic, predictive and prognostic biomarkers remain the holy grail of platforms, algorithms and protocols which are the crucial for Personalized & Precision Medicine (PPM).

The primary damage in AIM progression and evolution which is mediated by anti-CM autoAbs to trigger a release of separate and pathogenically valuable cardiac-associated epitopes into the bloodstream. A subset of patients with AIM and of their symptom-free relatives has circulating heart-reactive autoAbs. Moreover, some of these autoAbs may also have a functional role in patients, as suggested by in vitro data as well as by preliminary clinical observations, though further work is in progress to clarify this important issue. And along with canonical Abs, some of the families proven to occur are Abs possessing with catalytic (proteolytic) activity (catAbs or abzymes) and thus to belong to Abs with a feature of functionality!

The unique clinical case is a family of Ab-proteases detectable in AIM to cleave CM. Of great interest is the evolution of Ab-associated proteolytic activity at different stages of the disease progression. The activity of Ab-proteases was first registered at the subclinical stages 4-12 months prior to the clinical illness. And the activity of the Ab-proteases revealed significant correlation with scales of autoaggression and the disability of the patients with AIM as well. So, the activity of Ab-proteases and its dynamics tested would confirm a high subclinical and predictive value of the tools as applicable for monitoring protocols.

The translational potential of this knowledge is in the rational design of new diagnostic tools and new targeted therapeutics based on principles of artificial biocatalysts and biodesign. And thus Ab-proteases can be programmed and re-programmed to suit the needs of the body metabolism or could be designed for the development of new catalysts with no natural counterparts.

Further studies on Ab-mediated CM degradation and other targeted Ab-mediated proteolysis may provide biomarkers of newer generations or even new biomarker families and thus supplementary tools to diagnose, to monitor, to control and to treat and rehabilitate AIM patients at clinical stages and to prevent the disorder at subclinical stages in persons-at-risks to secure the efficacy of regenerative manipulations and for assessing the disease progression and predicting disability of the AIM patients and persons-at-risks.

Audience Take Away Notes

- To learn more about Ab-mediated catalysis (proteolysis) as the biological phenomenon of the next-step generation and its impact in daily practice of cardiac practitioner
- The presentation would get the audiences armed with new approaches to monitor both clinical and subclinical stages of AIM in precise scenarios
- In this translational research faculty could use the latter for setting up translational pipelines on one hand and to teach the students and postgraduate physicians on the other one
- The findings will solve a problem of predictive diagnostics, preventive and rehabilitative measures to be applied for monitoring the AIM patients, the persons-at-risks and to prevent transformation of subclinical stages of AIM into clinical ones

Biography

Sergey Suchkov was born in the City of Astrakhan, Russia, in a family of dynasty medical doctors. In 1980, graduated from Astrakhan State Medical University and was awarded with MD. In 1985, Suchkov maintained his PhD as a PhD student of the I.M. Sechenov Moscow Medical Academy and Institute of Medical Enzymology. In 2001, Suchkov maintained his Doctor Degree at the National Institute of Immunology, Russia. From 1989 through 1995, Dr. Suchkov was being a Head of the Lab of Clinical Immunology, Helmholtz Eye Research Institute in Moscow. From 1995 through 2004 - a Chair of the Dept for Clinical Immunology, Moscow Clinical Research Institute (MONIKI). In 1993-1996, Dr. Suchkov was a Secretary-in-Chief of the Editorial Board, Biomedical Science, an international journal published jointly by the USSR Academy of Sciences and the Royal Society of Chemistry, UK. At present, Dr. Sergey Suchkov, MD, PhD, is: Professor and Chair of the Dept for Personalized Medicine, Precision Nutriciology & Biodesign of the Institute for Biotech & Global Health of RosBiotech and Professor, Dept for Clinical Allergology & Immunology, A.I. Evdokimov Moscow State University for Medicine & Dentistry (MGMSU), Russia; Secretary General, United Cultural Convention (UCC), Cambridge, UK. Dr. Suchkov is a member of the: New York Academy of Sciences, USA. American Chemical Society (ACS), USA; American Heart Association (AHA), USA; European Association for Medical Education (AMEE), Dundee, UK; EPMA (European Association for Predictive, Preventive and Personalized Medicine), Brussels, EU; ARVO (American Association for Research in Vision and Ophthalmology); ISER (International Society for Eye Research); Personalized Medicine Coalition (PMC), Washington, DC, USA.



T. Rajini Samuel
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Unlocking the cardiac vector theory and einthoven equilateral triangle model: A paradigm shift or a major transition in ECG interpretation?

Introduction: Electrocardiogram (ECG) has offered immense clinical value for more than a century yet its interpretation remains an arduous task and ECG phobia develops in some of the junior doctors and staff nurses often seeking the help of medical experts in that field. Einthoven used the cardiac vector concept to describe the electrical activity of the heart even before a century but never published a detailed description of it. Many researchers attempted to solve this problem but was not completed. The complete Heart-Lead vector relationship using Cardiac vector theory and einthoven's equilateral triangle model was explained in detail by the current author in previous research articles. Cardiac vector theory proposed by the current author states that voltage (scalar quantity measured in volt) recorded in a particular lead is the result of dot product between cardiac vector (electrical field vector of dimension volt/metre) and lead vector (measured in metre).

Objectives: To formulate and apply the cardiac vector theory in ECG interpretation to explain the einthoven equilateral triangle model for the application of novel ECG Interpretation

Methods: In the hex-axial reference system of ECG, plot the net voltages of bipolar limb leads and connect them. Similarly, plot the net voltages of unipolar limb leads and connect them. Each forms equilateral triangles. The equilateral triangle can be converted into a circle. Each circles have same origin, same orientation, but different radii because bipolar and unipolar limb leads have different resistance. Multiply each unipolar limb lead voltages by correction factor 1.154 and then plot. Then the two equilateral triangles are on the same circle.

Results: The voltage recorded by the electrodes (Lead I, II, III, aVR, aVL and aVF) are the vertices of an electrical equilateral triangle. Heart is at the center of the electric field it generates. The right arm, left arm and left leg are the extensions of its electrical field which was compared by einthoven to a homogeneous volume spherical conductor with heart at the centre of the sphere. Each cardiac wave (P, QRS, T) can be represented in the form of circles. The diameter of the circle denotes the resultant cardiac vector. The perimeter (circumference) of the circle denotes the electrical field of the heart which it generates with heart at the center of the circle. All circles (see the diameter) should be formed in the left lower quadrant except QRS which can go up to -30 degree. When the angle between 'QRS' and 'T' circles deviate it usually indicates strain, abnormal electrical conduction and ischemia. The size of a circle will be greater for higher voltage and vice versa. During ST-segment no circle will be formed since it is an iso-electric period. The amount of myocardial injury will be related to the magnitude of circle during the ST-segment.

The orientation of the electrode position is represented by the lead vector. The velocity of cardiac vector is related with time in the horizontal axis of ECG. The relationship between the magnitude and orientation of heart vector with lead vector produces different voltage deflections in the various leads in the vertical axis. The understanding of the cardiac vector concept helps to clearly analyse and correlate the ECG wave changes in different leads for various cardiac diseases.

Conclusion: The Cardiac vector theory and einthoven's equilateral triangle model forms the basic foundation in the teaching and understanding of ECG interpretation that helps to overcome the arduous task of pattern memorization method. Coronary artery disease continues to remain as the number one killer disease of the world. So, the combination of the 12-lead ECG with this resultant cardiac vector represented by circle provide the optimum and easier approach to ECG interpretation resulting in saving countless lives of patients.

Keywords: Cardiac Vector, Lead Vector, Paradigm Shift, ECG Interpretation.

Audience Take Away Notes

- Basic physics involved in ECG
- Application of mathematical concepts of scalar and vector
- Understanding of lead vector concept and einthoven's equilateral triangle model
- Formulation of cardiac vector theory and its application in ECG Interpretation
- Novel approach to interpret ECG findings
- Cardiac vector theory will help in better understanding of ECG that helps in prompt interpretation of ECG report to reduce the mortality of the number one killer disease of the world

Biography

Dr. T. Rajini Samuel is presently working as a Professor of Biochemistry in Shri Sathya Sai Medical College and Research Institute, Chennai. He did MBBS (2004 -2010) in Chengalpattu Government Medical College, Tamil Nadu, India. He worked in Venkateshwara Hospitals, Chennai to complete the ECG project, proposed cardiac vector theory and developed a Novel approach using vector concepts to interpret ECG findings. He completed M.D Biochemistry in Sree Balaji Medical College and Hospitals, Chennai in 2015. He then focused his research on Arterial Blood Gas (ABG) analysis. He had developed a novel pH based ABG interpretation method, constructed a novel four quadrant graphical tool for ABG interpretation and proposed a novel approach to identify and understand hidden and mixed acid base disorders. He had derived novel equations of motion in Ventilator Graphics Interpretation for mechanical ventilation. He had published 41 research articles, 3 books and one chapter. He had received High Flyers Global Achievers Award 2022 - The Best Medical Science Researcher, Atmanirbhar Bharath Award 2022 and Indian Achievers Award 2021 for Excellence in Innovation awarded by the Indian Achievers Forum.



T. Azizi
University of Wisconsin-Madison, Madison, WI, United States

Application of wavelet leader based analysis to model the heart's electrical activity

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.

Audience Take Away Notes

- Using rigorous analytical mathematical methods, we are able to model different phenomena
- Combination of different fields of science in our will help to bridge the gap between different studies
- Yes, It's the beauty of mathematics as the mother of other sciences
- Yes, by looking at the big picture and applying our knowledge we can simplify hard problems
- Yes the applied method is robust

Biography

T. Azizi has someone who is highly inquisitive and analytical, she is 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. She currently a Research Associate at University of Wisconsin-Madison. Her current work on developing new innovative methods in topological data analysis, computational 87

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. She is a Post-Doctoral Fellow at Florida State University. Her 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 her studies in MS and PhD, She is an effectively and efficiently learned the fundamentals of biomathematics. Her research in one direction focuses on analyzing the behavior and evolution of population dynamics and biological systems. Further, she is assisted in the development of appropriate model with application in Pharmacology and Physiology using collected data with great integrity.



Linqi Jin[1], Christian Park[1], Sunder Neelakantan[2], Shweta Karnik[1], Arnab Dey[1], Reza Avazmohammadi[2], Lakshmi Prasad Dasi[1], Hanjoong Jo[1], Holly Bauser Heaton[1,3,4], Vahid Serpooshan[1,3,4]*

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Modeling human heart development and congenital disease using an iPSC-based 3D bioprinted model of embryonic human heart

Human cardiogenesis is a finely orchestrated process that involves dynamic genetic and morphological changes. However, the cellular and microenvironmental processes underlying the human heart development remain obscure, due to limited access to human heart in utero and the lack of effective experimental models. Advances in 3D bioprinting, perfusion bioreactor, and stem cell technologies have enabled the fabrication of cardiac tissues with complex structures and microenvironment, and their dynamic in vitro culture. Here we present a perfusable 3D bioprinted model of embryonic human heart tube (day 22), consisting of endocardium, cardiac jelly, and myocardial layers. We use Human Induced Pluripotent Stem Cell-Derived Cardiomyocytes (hiPSC-CMs) and Endothelial Cells (ECs), derived from healthy donors versus Hypoplastic Left Heart Syndrome (HLHS) patients, to cellularized the bioprinted heart tubes. Full endothelialization of the heart tube cavity, progression of myocardial tissue compaction and global contractile function demonstrated robust viability and cardiac function/maturity of the engineered heart under dynamic flow culture. Further, single cell RNA sequencing revealed a promoting effect of the dynamic flow on cardiac tissue maturation and cell lineage commitment. Comparison of sequencing data in pre versus post flow culture identified heterogeneous CM and EC subpopulations, relating to the key developmental processes during linear heart tube stage (day 22). We also identified noticeable differences in the readouts obtained from the healthy versus diseased (HLHS) cell sources in the 3D constructs. Overall, this study establishes a perfusable model of human heart tube with robust function and relevance to the early developmental stages. Cellular activities related to cardiogenesis upon hemodynamic flow activation were observed, suggesting the great capacity of the 3D bioengineered model for studying cardiogenesis, disease, and prenatal therapeutic targets.

Audience Take Away Notes

- The audience will learn on the latest applications of advanced tissue biomanufacturing (3D bioprinting) and perfusion bioreactor technologies to create highly complex in vitro models of the human heart
- The key outcomes of this work could inspire researchers in further developing more complex in vitro models to study heart development and congenital heart disease
- Several lessons learned in this study could be also utilized as teaching/educational materials to be taught to the students in the classroom or clinical training settings
- The biomanufacturing and testing workflow developed here could be further expanded and adopted to other developmental stages of prenatal human heart, as well as postnatal stages, to study a wide variety of physiological and/or pathophysiological processes

Biography

Dr. Vahid Serpooshan did his BSc/MSc in Materials Science at Sharif University (Iran) and his PhD in tissue engineering at McGill University (Canada, 2011). He worked at Stanford University as Postdoctoral Fellow (Pediatric Cardiology) and Instructor (Stanford Cardiovascular Institute), working on developing a new generation of cardiac patch devices to repair ischemic heart injuries, using 3D bioprinting and iPSC technologies. In 2018, Dr. Serpooshan joined Emory University and Georgia Tech as Assistant Professor of Biomedical Engineering and Pediatrics, where his multidisciplinary team is now working on a variety of 3D bioprinting-based tissue engineering and disease modeling projects.



Valery Boukarim*, Popov Volodymyr .V, Pukas Katrine, Rudenko Anatoly

National Amosov's Institute of Cardiovascular Surgery, Kyiv, Ukraine

Arch plasty of left atrium for moderate dilatation of left atrium during MV`s correction: Is it necessary?

Objective: To determined possibillities of Left Atrium (LA)`s reduction by original method of Arch Plasty of LA (APLA) during Mitral Valve Replacement (MVR) for isolated Mitral Valve Disease (MVD).

Methods: During 2005 – 2022 yy. 454 adult Patients (pts) with MVD and LA`s moderate dilatation of LA (diameter of LA 50,0 < 60,0 mm) average 57,1 ± 0,8 mm were operated at institute. MVR were performed in 443 pts and MV`s plasty in 11. There were 194 (42,7%) males, 260 (57,3%) females. Average age was 57,4 ± 6,9 yy. There were 239 (52,7%) in IY NYHA class, 186 (41,0%) in III class and 29 (6,3%) in II class. The main reason of MVD was: Rheumatism (59%). Atrial fibrillation was marked in 83,7% pts.

All data divided at 2 groups: Group A - APLA + ligation of LA`s auriculum was 117 pts and group B – 337 pts only MVR without LA`s plasty or ligation`s auriculum were performed. All operations were used with CPB, moderate hypothermia with crystalloid cardioplegia. Cross-clamping time of aorta (minutes) were: Group A - 71,1 ± 8,2 – and group B - 55,1 ± 6,3 (p< 0,05). Absence of using blood product during all hospital period was occured in 44,5%.

Results: The hospital mortality were: In group A - 0,9% (n=1/117) and in group B - 2,1% (n=7/337) (p<0,05). Reasons of deaths: Group A - pneumonia (1pts), group B – brain damage (thrombemboli) (2 pts), heart failure (3 pts), MOF (3 pts). Sinus rhythm was restored at discharge: Group A - 21,6% and group B - 5,2%(p<0,05). At the remote period (average was 8,3 ± 2,1 yy) 437 (93,2%) pts were followed–up.

Data of echo for group A were: Diameter of LA (mm) - Preoperative (PRE) - 57,9 ± 4,7, postoperative (POST) - 48,3 ± 2,4, remote period (RP) - 49,5 ± 2,1; Ejection Fraction of LV (EFLV): PRE – 0,54 ± 0,03, POST - 0,57 ± 0,03, RP - 0,59 ± 0,04. At the remote period (n = 110) thromboembolic events were marked in 6,2% including lethal 0% and HF in 3,1%. Sinus rhythm was occured in 15,5% pts.

Data of echo for group B were: Diameter of LA (mm): PRE- 57,4 ± 3,5, POST - 55,2 ± 2,8, RP - 63,2 ± 3,5; EFLV: PRE – 0,54 ± 0,04, POST - 0,55 ± 0,03, RP – 0,53± 0,05. At the remote period (n = 327) thromboembolic events were marked 16,8% including lethal 8,2% and HF respectively - 17,5%. Sinus rhytm was marked in 3,1%.

Conclusion: The original method of APLA with ligation of left atrium`s auriculum was allowing to improve better clinical results at group A than in B during all postoperative period (p<0,05).

Biography

Valery Bukarim is a M.D researcher of the surgical department for the treatment of acquired heart defects of the National Institute of Cardiovascular Surgery named after M.M. Amosov



Valery Bukarim*, V. Popov Volodymyr, Pukas Katerina, Lazoryshynetz Vasily

National Amosov`s Institute of Cardiovascular Surgery, Kyiv, Ukraine

Triangular plasty of left atrium for atriomegaly during mitral valve correction: Is it neccesary?

Objective: To determined possibillities of Left Atrium (LA)`s reduction by original method of Triangular Plasty of LA (TPLA) during mitral valve replacement (MVR) for isolated Mitral Valve Disease (MVD).

Methods: During 2005 – 2022 yy. 725 adult Patients (pts) with MVD and LA`s atriomegaly (diameter of LA > 60 mm) average 68,4 ± 5,8 were operated at Institute. MVR were performed in 687 pts and MV`s plasty in 38. There were 330 (45,5%) males, 395 (54,5%) females. Average age was 55,5 ± 8,9 yy. There were 448 (61,8%) in IY NYHA class and 277 (38,2%) in III class. All data divided at 2 groups: Group A - TPLA + ligation of LA`s auriculum was 148 pts and group B – 577 pts only MVR without LA`s plasty or ligation`s auriculum. All operations were performed with CPB, moderate hypothermia with crystalloid cardioplegia. Cross-clamping time of aorta (min) were: group A - 77,4 ± 8,6 and group B - 51,2 ± 4,9 (p< 0,05).

Results: The hospital mortality were: in group A - 2,0% (n=3/148) and in group B - 2,6% (n=15/577) (p<0,05). At the remote period (average was 8,2± 1,3 yy) 651 (91,7%) pts were followed–up.

Data of echo for group A were: Diameter of LA (mm) - Preoperative (PRE) - 63,2 ± 5,3, postoperative (POST) - 51,6 ± 3,8, remote period (RP) - 52,2 ± 2,7; Ejection Fraction of LV (EFLV): PRE – 0,52 ± 0,05, POST - 0,55 ± 0,04, RP - 0,58 ± 0,03.

Data of echo for group B were: Diameter of LA (mm): PRE- 68,5 ± 5,2, POST - 69,3 ± 4,8, RP - 77,1 ± 5,1; EFLV: PRE – 0,53 ± 0,04, POST - 0,54 ± 0,05, RP – 0,47 ± 0,04. At remote period thromboembolic events and heart failure were marked respectively: In group A -1,7% and 2,9% and in group B – respectively 7,5% and 27,2% (p<0,05).

Conclusion: The original method of TPLA was allowing to improve better clinical results at group A than in B (p<0,05).

Biography

Valery Bukarim is a M.D researcher of the surgical department for the treatment of acquired heart defects of the National Institute of Cardiovascular Surgery named after M.M. Amosov



Vikram Jitendra*, H. El Shafei, K. Buchan
Aberdeen Royal Infirmary, Aberdeen, United Kingdom

Sutureless aortic valve replacement

Aortic stenosis is the most common valvular disease and has a poor prognosis without surgical treatment. The use of Sutureless Valves (SV) has been emerging as a promising surgical option in certain patient populations especially in the elderly, frail and in redo cardiac procedures due to their straightforward and fast deployment technique and the encouraging mid- and long-term outcomes compared to Surgical Aortic Valve Replacement (SAVR) with stented valves.

Sutureless and rapid deployment prostheses appeared to provide excellent haemodynamic results together with reduced surgical trauma by facilitating minimally invasive approach. The sutureless surgical approach provides direct visualization of the implantation and target orifice location.

Sutureless aortic valve prostheses provide a safe and feasible treatment option in patients undergoing a combined aortic and mitral valve. Potential advantages for sutureless aortic prostheses include reducing cross-clamp and Cardiopulmonary Bypass (CPB) duration.

The implantation of a Perceval (LivaNova) sutureless aortic valve is associated with a better postoperative course, as manifested by the lower incidence of postoperative renal failure and blood transfusions.

Furthermore, the use of the perceval valve allowed for implantation of larger diameter prostheses, resulting in lower transvalvular gradient, and there was no difference in the frequency of postoperative strokes and paravalvular leaks with sutured stented valves.

Therefore sutureless aortic valve replacement has emerged as a suitable innovative alternative for treatment of aortic stenosis. The emergence of TAVI (Transcatheter Aortic Valve Implantation) for severe aortic valve stenosis and its success has resulted in a drive towards surgical innovation.

Biography

Mr. Vikram Jitendra is a specialty doctor in cardiothoracic surgery at Aberdeen Royal infirmary. He is an experienced cardiothoracic surgeon and has spent over 20 years in this field. He has trained in India and in the United Kingdom and is a qualified cardiothoracic surgeon from the United Kingdom. My main interests are coronary bypass surgery, valve repair and replacement surgeries.



Vivek Vaibhav*, Harmandeep Singh, Naman khurana
Rama Medical College, Hapur, Uttar Pradesh, India

Anesthetic management of a patient with dilated cardiomyopathy posted for hernioplasty

Dilated Cardiomyopathy (DCM) is a myocardial disease characterised by ventricular dilatation and global myocardial dysfunction (ejection fraction < 40%).

Patients usually present with symptoms of biventricular failure, e.g. fatigue, dyspnoea, orthopnoea, ankle oedema

Associated with a high mortality (2-year survival = 50%) due to progressive cardiogenic shock or ventricular dysrhythmias (sudden cardiac death)

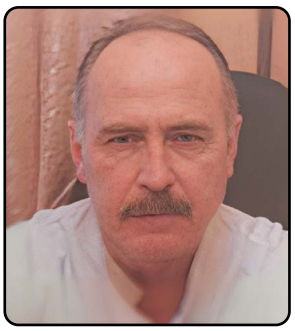
Epidural anesthesia is a method of neuraxial pain control in which anesthetic medications are injected into the epidural space to block sensory and motor spinal nerve roots in the thoracic, abdominal, pelvic, and lower extremity areas. This epidural technique can be used for anesthesia during procedures, chronic pain, or muscle spasticity as a primary anesthetic or pain management adjuvant. A primary advantage epidural anesthesia offers is the ability for clinicians to tailor the medication used and the type of administration (ie, intermittent or continuous infusion) to meet the clinical need. Additionally, this technique can reduce the opioid requirement during and after a procedure, lowering the incidence of associated side effects.

Audience Take Away Notes

- Management of patient with DCMP
- Chioce of anesthesia
- XRAY and ECHO fingings

Biography

Dr. Vivek Vaibhav Professor and Head at RAMA Medical College Hospital and Research Institute, Hapur -Uttar Pradesh, INDIA and graduated as MD in Anesthesia and Critical care. He then joined the Senior Residency from Safdurjung Medical College (VMMC-NEW DELHI). He has worked with various organizations and hospital. Currently he is serving as a Professor and Head of Department at Rama Medical College. He has various Publications and Articles posted at both National and International Level.



Volodymyr Popov*, Bolshak Olexandr, Pukas Katerina, Lazoryshynets Vasily

National Amosov Institute of Cardiovascular Surgery, Kyiv, Ukraine

Mitral-aortic-tricuspid valve correction in CPB complicated with small cavity of left ventricle

Aim: To determine significance of Patient-Prosthesis Mismatch (PPM) (indexed effective orifice area < 1,2 cm^2/m^2) after combined Mitral-Aortic Valve Replacement (MAVR) + TV`s plasty (TV) in pts with Small Cavity of Left Ventricle (SCLV) (End-Diastolic Volume (EDV) ≤ 75 ml) during hospital period.

Materials: 1811 adult patients (pts) with MAVR+ TV`s plasty were operated in Institute from 01.01.2009 till 01.01.2024. There were 127 (7,0%) pts with SCLV (mitral-aortic stenoses). There were 48(37,8%) males and 79(62,2%) females. Average age was 53,2+ 7,1. 110 (86,6%) pts belonged to IV NYHA class of heart failure, 17 (13,4%) – to III class. Previous closed mitral comissurotomy was performed in 31 (24,4%) pts, to 7 pts – twice (closed recomissirotomy by closed method). Thromboses of left atrium was marked at 13 (10,2 %) pts, including massive in 3 pts. All operations were performed with cardiopulmonary bypass and moderate hypothermia with crystalloid cardioplegia. Average BSA was 1,87±0,32 m^2. Following prostheses were implanted: Bileafle (Saint Jude, Carbomedics, On-X, ATS) (n=88) and monodisc as Alcarbon`s type (MIKS, LIKS) (n=39). Following prosthesis sizes were used: 23 mm (n=1), 25 mm (n=74), 26 mm (n=3), 27 mm (n=49).

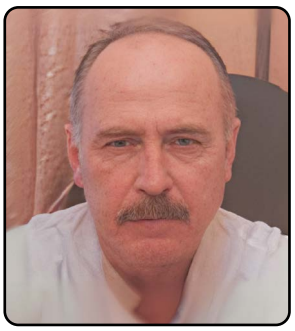
Results: Hospital Mortality (HM) was 5,5% (n=7). It was higher in cases with 27 mm size of implanted prosthesis - 8,2% (n=4/49), than other group - 3,8% (n=3/78) (p <0,01). PPM were marked in 21 (16,5%) pts with BSA >1,75 m^2 and size of prothesis 25 mm but theren`t influence on HM. Heart failure and PPM were marked in 5 (3,9%) pts with BSA>1,75 $m^2$, size of prothesis 25 mm and cavity of LV (EDV≤50 ml). Risk-factors for PPM SCLV`s group of pts on hospital stage were: Very small cavity of LV (EDV≤50 ml) especially in pts with BSA>1,75 m^2, previous operation, pulmonary hypertension (> 90mm Hg), mitral valve calcification 3+, duration of rheumatic disease ≥ 25 years. At the remote period (average 15,3± 1,2 yy) 115(95,8%) pts were followed–up. Survival at 15 year follow- up – 85,1%. EDV was increased at 35,4% at the hospital period. PPM wasn`t marked at remote period.

Conclusion: Pts with SCLV are in group of higher risk for operation and increasing risk of PPM. In these cases implantation of 25 mm prosthesis is expedient, but for pts with EDV EDV≤50 ml BSA>1,75 m^2 it may lead for significant PPM and heart failure. Bioprosrhesis cannot be used in cases of critical small cavity of left ventrical.

Biography

Popov Volodymyr is serving as the Head of the Department of Surgical Treatment of Acquired Heart Diseases, and holding titles such as Philosopher Doctor (Ph.D.), Doctor of Medical Sciences (Doc.Med.Sci.), and Professor. He has an extensive scientific portfolio, authoring 512 scientific publications, including 273 peer-reviewed articles in both domestic and international journals. Over the past five years, he has published 21 papers on Scopus, contributed to 7 monographs, and secured 44 intellectual property rights documents. His mentorship has guided 3 candidates to completion, and he is currently supervising 1 candidate dissertation and consulting on 1 doctoral dissertation. Additionally, he is a member of the editorial board for one scientific publication. Among his numerous accolades, Popov received the State Prize of Ukraine in the field of science and technology in 2016, the M.M. Amosov Medal from the National Academy of Ukraine in 2019, and the title of Honored Doctor of Cardiovascular Surgeons of Ukraine. He is an active

member of several prestigious organizations, including the European Association of Cardiothoracic Surgeons and the Associations of Cardiovascular Surgeons of Ukraine, Europe (EACTS, EACVS), and the USA (STS, AHA). In October 1998, he completed a notable internship at the renowned Clinic of Professor Michael De Bakey at Baylor College of Medicine, Methodist Hospital, under the mentorship of Professor Hazim Safi, a leading authority in thoracoabdominal aneurysm surgery. Professor Popov has pioneered numerous clinical and scientific developments in cardiovascular surgery, including innovative techniques for thrombosis removal, atrial appendage resection, left atrium arch plasty, triangular plasty for left atriomegaly, complex reconstruction of the left heart chambers, and correction methods for small left ventricular cavities. He also developed the autopericardial technique for the nutrient foot of the sinus node to prevent sinus node weakness and sudden death during operations involving artificial circulation.



Volodymyr V. Popov*, Boukarym Valery, Mazur Olexandra, V. Pukas Katrine, V. Lazoryshynets Vasily

National Amosov Institute of Cardiovascular Surgery, Kyiv, Ukraine

Reconstruction of left part of the heart for combined mitral-aortic-tricuspid valve diseases

Objective: To determined possibillities of correction of the left parts of the heart by preservation of MV`s apparatus and concomitant reduction of Left Atrium (LA) during correction of Combined Mitral-Aortic-Tricuspid Valve Diseases (CMATD).

Methods: During 01.01.2006-01.01.2022 yy. 201 adult patients (pts) were operated with CMATD, giant diameter of LA (diameter 60 mm and more) and concomitant left ventriculomegaly (left ventricle`s end-diastolic volume 300 ml and more) at Institute. Average age was 57,2± 10,6 yy. 171 (85,1%) pts were in IY NYHA class and 30 (14,9%) in III class. All material divided at 2 groups: Group A (n= 82): MAVR + LA`s plasty (all pts) + MVR with preservation of posterior leaflet (all pts) and additionally translocation of anterior leaflet`s papillary muscles (n=54)+ TV`s plasty; group B (control group) (n= 119): Only MAVR without preservation of MV`s structure and without LA`s plasty+TV`s plasty. In both groups concomitant procedures were occured on reconstruction of the annuli of narrow ostium of aorta (n =5),, CABG (n =21).

Results: There were 3 deaths at the hospital period (Hospital Mortality (HM) - 3,6%) (group A). At the remote period (average was 9,3± 1,8 yy) 75 pts were followed –up. Sinus rhythm was preserved at 11 (14,7%) pts and there were 3 deaths. Unsatisfactive results were marked: myocardial infarction (n=2), thromboembolic event (n=1).

Data of echo for group A: End-Systolic Volume Index (ESVI) (ml/m.sq.) - preoperative 78,8 ± 13,5, postoperative (6 -11 dd) - 59,8 ± 9,1 and at the remote period 49,6 ± 7,2 and diameter of LA (mm) preoperative - 63,4 ± 5,2, postoperative - 49,4 ±4,2, remote period - 51,8 ± 3,3.

There were 6 deaths at the hospital period (HM - 5,0%) (group B). At the remote period (average was 8,1± 1,5 yy) 99 pts were followed –up.

Data of echo for group B: ESVI - preoperative 81,8 ± 12,2, postoperative (6 -11 dd) - 70,6 ± 13,4 and remote period 61,4 ± 9,2 and diameter of LA (mm) preoperative - 64,5 ± 5,2, postoperative - 62,4 ± 6,7, remote period – 74,1 ± 5,6. Sinus rhythm wasn`t marked in any pts and there were 13 deaths. Unsatisfactive results were marked: progressive heart failure(n=8), thromboembolic events (n=4).

Conclusion: Reconstruction of the left part of the heart for CAMVD by preservation of MV and LA`s plasty during MAVR was allowing to improve indixes of LV`s and LA`s morphometry, contractility during early and at the remote period comparing with group B.

Biography

Popov Volodymyr is serving as the Head of the Department of Surgical Treatment of Acquired Heart Diseases, and holding titles such as Philosopher Doctor (Ph.D.), Doctor of Medical Sciences (Doc.Med.Sci.), and Professor. He has an extensive scientific portfolio, authoring 512 scientific publications, including 273 peer-reviewed articles in both domestic and international journals. Over the past five years, he has published 21 papers on Scopus, contributed to 7 monographs, and secured 44 intellectual property rights documents. His mentorship has guided 3 candidates to com-

pletion, and he is currently supervising 1 candidate dissertation and consulting on 1 doctoral dissertation. Additionally, he is a member of the editorial board for one scientific publication. Among his numerous accolades, Popov received the State Prize of Ukraine in the field of science and technology in 2016, the M.M. Amosov Medal from the National Academy of Ukraine in 2019, and the title of Honored Doctor of Cardiovascular Surgeons of Ukraine. He is an active member of several prestigious organizations, including the European Association of Cardiothoracic Surgeons and the Associations of Cardiovascular Surgeons of Ukraine, Europe (EACTS, EACVS), and the USA (STS, AHA). In October 1998, he completed a notable internship at the renowned Clinic of Professor Michael De Bakey at Baylor College of Medicine, Methodist Hospital, under the mentorship of Professor Hazim Safi, a leading authority in thoracoabdominal aneurysm surgery. Professor Popov has pioneered numerous clinical and scientific developments in cardiovascular surgery, including innovative techniques for thrombosis removal, atrial appendage resection, left atrium arch plasty, triangular plasty for left atriomegaly, complex reconstruction of the left heart chambers, and correction methods for small left ventricular cavities. He also developed the autopericardial technique for the nutrient foot of the sinus node to prevent sinus node weakness and sudden death during operations involving artificial circulation.



Yadi Liu[1]*, YuWang[1,2], Zhijian Lin[1,2], Xiaomeng Zhang[1,2], Bing Zhang[1,2]

[1]School of Chinese Materia Medica, Beijing University of Chinese Medicine, Beijing, China
[2]Center for Pharmacovigilance and Rational Use of Chinese Medicine, Beijing, China

Hyperuric acid is involved in the progression of adriamycin cardiotoxicity

Objective: Based on the phenomenon of elevated blood uric acid in patients with clinical adriamycin cardiac injury, to explore the effect of high uric acid on the progression of adriamycin cardiotoxicity.

Methods: Adriamycin cardiotoxicity mouse model was established by intraperitoneal injection of adriamycin 3.5 mg/kg/3d, and high uric acid + cardiotoxicity mouse model was established by exogenous administration of potassium oxalate combined with yeast extract by gavage on the basis of cardiotoxicity model, to observe the effect of high uric acid on the cardiotoxicity of adriamycin.

Results: Compared with the control group, the cardiotoxic group showed a significant decrease in left ventricular ejection fraction and left ventricular shortening fraction, a significant increase in CTnI, BNP and NT-ProBNP myocardial injury markers, and a significant increase in blood uric acid level when the cumulative dose of adriamycin reached 14mg/kg; compared with the cardiotoxic group, the hyperuricemic+cardiotoxic group had significantly higher blood uric acid levels, significantly lower left ventricular ejection fraction, left ventricular shortening fraction, and higher levels of CTnI, BNP, and NT-ProBNP markers of myocardial injury.

Conclusion: High uric acid can participate in the development of adriamycin cardiotoxicity and maybe exacerbate the cardiac injury condition in adriamycin cardiotoxic mice.

Keywords: Hyperuricemic, Adriamycin, Doxorubicin, Cardiotoxicity.

Audience Take Away Notes

- Recognizing that high uric acid is indeed an independent risk factor for cardiovascular disease
- Understanding the involvement of hyperuric acid in the development of adriamycin cardiotoxicity
- Uric acid lowering may be a new direction in the development of drugs to combat adriamycin cardiotoxicity

Biography

Yadi Liu, female, Master's degree student, studying in Beijing University of Chinese Medicine, her research interests are in the prevention and treatment of metabolic diseases by traditional Chinese medicine.



Yasser Mohammed Hassanain Elsayed
Critical Care Medicine, Egyptian Ministry of Health (MOH), Damietta Health Affairs, Damietta, Egypt

Graded phenomenon (Yasser's Phenomenon): A novel electrocardiographic phenomenon change the arrhythmia directory; retrospective-observational study; research article in cardiology

Background: Arrhythmias are one of the most serious disorders in cardiovascular and clinical medicine. Understanding the pathogenesis and mechanisms of arrhythmias is very advantageous to the appropriate management and treatment of all arrhythmia types. The “graded phenomenon” is a novel directory phenomenon for understanding arrhythmia. The principle of the “graded phenomenon” is based on catching the graded changes in serial ECG tracings or even a single one regarding the arrhythmias.

Method of Study and Patients: My case study was an observational retrospective for a 30-case report series. The study was conducted in both Fraskour Central Hospital (intensive care unit, and emergency room) and physician outpatient clinic. The author reported the 30 cases thorough nearly 4 years, starting from Jan 13, 2016, and, ending on February 9, 2020.

Results: The age mean is 58.3 years with male sex predominance (56.67%). The changes in graded phenomenon are classified into up-grading; 20%, down-graded; 10%, changed to NSR; 43.33%, changed to AF; 3.33%, changed to sinus tachycardia; 3.33%, therapeutic reversal; 3.33%, fixed –change; 10%, and variable change; 6.67%. The risk in the graded phenomenon is either high (40%), non-risk (43.33%), or still-risk (16.67%). The course in the graded phenomenon is either progressive (43.33%), regressive; 10%, intermittent; 6.67%, constant; 16.67%, transient; 20%, and non-fixed variation; 3.33%.

Conclusions: Graded phenomenon (Yasser's phenomenon) is a novel electrocardiographic phenomenon that changes the arrhythmia directory. It is a crucial step for understanding arrhythmia. The phenomenon is a new strong guide for monitoring and following up arrhythmic patients in cardiovascular patients.

Keywords: Graded Phenomenon, Yasser's Phenomenon, A Novel Electrocardiographic Phenomenon Change the Arrhythmia Directory.

Audience Take Away Notes

- Graded phenomenon (Yasser's phenomenon) is a novel electrocardiographic phenomenon that changes the arrhythmia directory
- It is a crucial step for understanding arrhythmia
- The phenomenon is a new strong guide for monitoring and following up arrhythmic patients in cardiovascular patients
- Widening this research to expand their research or teaching is advisable

Biography

Dr. Yasser Mohammed Hassanain Elsayed. Scientist, critical care physician, cardiologist, and independent researcher. Egyptian Ministry of Health. Publicized articles; 123. Innovations 10; 3 "Signs", 4 "Phenomena", 1 "Modification", 1 "Maneuver", and 1 “Method”. Speaker; 20 International conferences. Reviewer; 210 articles. Editor; 187 Journals. Internation-

al Conferences OCM; 7. Instructor; 7 Official and 77 Non-official. COVID-19 publicized articles; 37. Prizes nomination; Breakthrough Prize and Einstein Prize. Excellence certificate (98). The most famous articles; Wavy Triple An Electrocardiographic Sign (Yasser's Sign) in Hypocalcaemia. Graded Phenomenon (Yasser's Phenomenon). Connected Aircraft Squadron Electrocardiographic Sign (Yasser's sign). Electrocardiographic Passing Phenomenon (Flying Phenomenon or Yasser's Phenomenon). Movable-weaning off an electrocardiographic phenomenon in hypocalcemia (Yasser's phenomenon of hypocalcemia). Yasser's COVID-19 Discrepancy phenomenon. Yasser's Maneuver for Regaining the Consciousness in the Psychogenic Coma. Yasser's Modification or Oxygen test in Coronary Artery Spasms. Three and One Method (Yasser's Method) to Overcome Streptokinase-Induced Hypotension in Acute Myocardial Infarction.



Yin Xiaoyang*, Liu zeyu, Liu Yadi, Wang Xue, Wang Yu, Lin Zhijian, Zhang Bing

School of Chinese Materia Medica, Beijing University of Chinese Medicine, Beijing, China

Exploring the pathological connection and clinical management of hyperuricemia and atherosclerosis: A literature review-based investigation

Objective: Currently, atherosclerosis and hyperuricemia remain among the most challenging metabolic disorders globally. Extensive epidemiological surveys and clinical studies have indicated a potential pathological link between hyperuricemia and atherosclerosis, even suggesting a bidirectional causative relationship. However, the precise nature of these connections has not been definitively established. Thus, in this review, we comprehensively examine and discuss the bidirectional relationship between hyperuricemia and atherosclerosis.

Methods: Employing a literature review approach, we discuss the bidirectional pathological connections between hyperuricemia and atherosclerosis, along with clinical prevention and treatment.

Results: This review highlights mechanisms through which atherosclerosis is influenced by hyperuricemia, including reduced bioavailability of nitric oxide due to oxidative stress induced by uric acid and xanthine oxidoreductase, inflammasome activation, effects on lipid metabolism and cholesterol transport, all of which, in turn, accelerate the occurrence and progression of atherosclerosis. In terms of clinical management, current strategies primarily involve pharmacotherapy and lifestyle interventions. Pharmacological treatments encompass uric acid synthesis inhibitors, cholesterol-modulating agents, and more. Lifestyle interventions comprise a balanced diet, moderate exercise, smoking cessation, and alcohol moderation.

Conclusion: The relationship between hyperuricemia and atherosclerosis is intricately intertwined. Early assessment and treatment of hyperuricemia are imperative to prevent atherosclerosis, and individuals with atherosclerosis should adopt dietary measures to prevent elevated uric acid levels.

Keywords: Uric Acid, Atherosclerosis, Prevention and Treatment, Pathological Connection.

Audience Take Away Notes

- From the perspective of literature review, the bidirectional pathological link between hyperuricemia and atherosclerosis and clinical prevention and treatment were comprehensively and systematically discussed
- Summarize the pathological link between hyperuricemia and atherosclerosis, including inflammasome activation, oxidative stress, dysbacteriosia, lipid metabolism abnormalities, etc., from clinical research and epidemiological research to drug research, and finally return to clinical prevention and treatment
- Through the pathological association analysis of hyperuricemia and atherosclerotic diseases, this paper provides new directions and ideas for the clinical prevention and treatment of the two diseases, and at the same time, it also warns against the inertness of clinical treatment of asymptomatic hyperuricemia patients

Biography

Yin Xiaoyang, graduated from Jilin Institute of Agricultural Science and Technology with a Bachelor's degree, is currently a Master's degree student in Clinical Chinese Pharmacy, studying at Beijing University of Chinese Medicine, with a research interest in Chinese medicine to prevent and treat metabolic diseases.



Zhongchen Li*, Chunyu Yu, Heng Zhang, Juntong Zeng, Zhe Zheng
Fuwai Hospital, CAMS and PUMC, Beijing, China

Triglyceride-glucose index is associated with poor prognosis in patients with stable coronary artery disease undergoing coronary artery bypass grafting

Background: The Triglyceride-Glucose (TyG) index, which is a reliable substitute indicator for insulin resistance, has been considered an independent risk factor for long-term outcomes in patients with cardiovascular disease. However, at present, only a limited number of studies with small sample sizes have evaluated whether the Triglyceride-glucose (TyG) index is associated with an increased risk of poor prognosis in patients with stable coronary artery disease undergoing coronary artery bypass grafting.

Purpose: This study aimed to investigate the impact of TyG index on clinical outcomes following CABG in patients with stable coronary artery disease.

Methods: A total of 16863 participants from a registry-based cohort were enrolled and divided into groups according to the tertiles of the TyG index. The TyG index was calculated by ln [fasting triglyceride (mg/dL) × fasting blood glucose (mg/dL)/2]. The primary outcome was the major adverse cardiovascular and cerebrovascular events (MACCE), a composite of all-cause death, myocardial infarction, cerebrovascular accidents or repeat revascularization. The associations between the TyG index and the primary endpoint was assessed by multivariable Cox proportional hazards regression analysis and restricted cubic splines.

Results: During a median follow-up of 3.3 years, 527 patients (31.3%) experienced at least one endpoint event. Based on the optimal cut-off value of the TyG index, patients were divided into the high TyG index group and the low TyG index group. After adequately adjusting for confounding factors, High TyG index group was associated with increased risk of MACCE (adjusted hazard ration [aHR]: 1.189, 95% confidence interval [95% CI]: 1.021-1.311, P＝0.018), which was in line with the results observed when the TyG index was treated as a continuous variable (aHR, 1.177 [95% CI, 1.019–1.286]; P=0.02). Restricted cubic spline curve exhibited that the relationship between the TyG index and MACCE was linear (p for non-linear＝0.425, p for overall＝0.01).

Conclusion: The TyG index is independently associated with MACCE, suggesting that the TyG index may serve as a valid indicator for predicting poor prognosis in patients with stable coronary artery disease undergoing coronary artery bypass grafting.

Audience Take Away Notes

- The present study is the largest analysis that focuses on the association of TyG index and prognosis in patients who underwent coronary artery bypass grafting
- Our findings indicate that a high TyG index is associated with a poor long-term prognosis in patients undergoing coronary artery bypass grafting. This association underscores the potential prognostic value of the TyG index in this patient population
- A high TyG index may act as a prognostic marker, signaling the need for early lifestyle interventions aimed at mitigating the risk of MACCE. Such interventions could potentially slow the progression or reduce the incidence of MACCE among at-risk individuals

Biography

Zhongchen Li is currently studying for his PhD in cardiovascular medicine at Fuwai Hospital, National Center for Cardiovascular Disease, Chinese Academy of Medical Sciences and Peking Union Medical College. His research interests are basic and clinical research of common cardiovascular diseases.



Zhongchen Li*, Chunyu Yu, Heng Zhang, Juntong Zeng, Zhe Zheng
Fuwai Hospital, CAMS and PUMC, Beijing, China

The synergistic effect of the triglyceride-glucose index and lipoprotein(a) on the prediction of major adverse cardiovascular events after coronary artery bypass grafting

Background: Lipoprotein(a) has been implicated as a pathogenic risk factor for atherosclerosis and its complications. The triglyceride-glucose (TyG) index, a novel surrogate marker for insulin resistance (IR), has been identified as an independent predictor of adverse cardiac events. However, no study has specifically addressed the interaction between these two metabolic risk factors. Whether the combination of lipoprotein(a) and the TyG index can more accurately predict prognosis in patients undergoing coronary artery bypass grafting (CABG) remains unclear.

Methods: A total of 15,648 participants from a registry-based cohort were enrolled. The TyG index was calculated using ln [fasting triglycerides (mg/dL) × fasting blood glucose (mg/dL)/2]. Patients were categorized based on the cut-off values for lipoprotein(a) and the TyG index. The primary outcome was major adverse cardiovascular and cerebrovascular events (MACCEs), including all-cause death, myocardial infarction, cerebrovascular accidents, or repeat revascularization. Following comprehensive adjustments for potential confounders, Cox regression analysis was performed. The interaction between lipoprotein(a) and the TyG index was estimated by the relative excess risk due to interaction (RERI), attributable proportion (AP), and synergy index (SI). The model's performance improvement, brought by including lipoprotein(a) and the TyG index, was assessed through net reclassification improvement (NRI) and integrated discrimination improvement (IDI).

Results: During a median follow-up of 3.3 years, 487 patients (31.1%) experienced at least one endpoint event. Significant independent and combined associations of lipoprotein(a) and the TyG index with adverse events were observed. Patients with higher levels of lipoprotein(a) and the TyG index had a higher risk of MACCEs (Kaplan-Meier analysis: log-rank $P < 0.001$; HR = 2.19; 95% CI 1.61–4.28, $P < 0.001$). There was a significant synergistic interaction between lipoprotein(a) and the TyG index [RERI (95% CI): 1.02 (0.11–2.25), $P = 0.022$; AP (95% CI): 0.23 (0.08-0.49), $P = 0.002$; SI (95% CI): 1.13 (0.57–2.99), $P = 0.031$]. The addition of lipoprotein(a) and the TyG index significantly improved prognosis prediction and model fitting [continuous NRI (95% CI): 0.197 (0.071–0.301), $P < 0.001$; IDI (95% CI): 0.017 (0.006–0.036), $P < 0.001$].

Conclusion: The synergistic interaction between lipoprotein(a) and the TyG index increases the risk of MACCEs in patients undergoing CABG, underscoring the need to consider both factors and their interaction in cardiovascular risk assessment.

Audience Take Away Notes

- The role of lipoprotein(a) and the triglyceride-glucose (TyG) index as independent and combined predictors of adverse cardiac events in patients undergoing coronary artery bypass grafting (CABG)
- Medical professionals can incorporate the assessment of lipoprotein(a) and the TyG index into their preoperative evaluations to better identify CABG patients at higher risk of developing MACCEs

- Researchers can use the findings to explore further the mechanisms underlying the synergistic effects of lipoprotein(a) and the TyG index, potentially uncovering new therapeutic targets, low the progression or reduce the incidence of MACCE among at-risk individuals

Biography

Zhongchen Li is currently studying for his PhD in cardiovascular medicine at Fuwai Hospital, National Center for Cardiovascular Disease, Chinese Academy of Medical Sciences and Peking Union Medical College. His research interests are basic and clinical research of common cardiovascular diseases.



Zuowei Pei[1,2,3]*, Shan Gao[2]

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Downregulation of CACNA2D1 protein is the key event involved in reducing hypertension-induced myocardial injury in exercised mice

Hypertensive HTN is one of the risk factors for cardiovascular disease, and exercise has a protective effect on the heart. However, the mechanism by which exercise affects HTN-induced myocardial damage is unclear. In this study, the exercise response model of HTN myocardial injury in mice was analyzed by multi-omics method to determine the possible influencing factors. The results showed that the concentrations of serum Ca^{2+} and brain natriuretic peptide in HTN group were significantly higher than those in control group, HTN+MICT group and HTN+HIIT group. Myocardial tissue injury and fibrosis increased in HTN group, but exercise training reduced pathological changes, and HTN+HIIT group improved more significantly. Therefore, we speculate that exercise may play a regulatory role in hypertension by altering the expression of certain genes and proteins in the body.

The results of omics study showed that there were significant differences in the expression of CACNA2D1 among different treatment groups. HIIT down-regulates CACNA2D1 through exercise, reduces Ca^{2+} concentration, and dilates vascular smooth muscle. In order to further elucidate the potential molecular mechanism of HIIT's effect on hypertension-induced myocardial damage through downregulation of CACNA2D1 gene, we performed western blot detection on eNOS-NO-cGMP-PKG signaling pathway, and the results showed that mice after HIIT, the expression levels of eNOS and PKG protein were significantly higher than those in HTN group and MICT group, indicating that HIIT can improve the myocardial damage induced by hypertension by down-regulating CACNA2D1 gene.

Therefore, our study shows that in exercise therapy, HIIT can significantly treat HTN mice by downregulating CACNA2D1, reducing Ca^{2+} concentration, and dilating vascular smooth muscle, thereby improving myocardial damage caused by hypertension in mice.

Audience Take Away Notes

- Through this study, we can have a new understanding of myocardial damage caused by hypertension, because we provide a new target and idea
- This research that other faculty could use to expand their research or teaching, because this study provides new insights through omics testing
- It improve the accuracy of a design, can provide new information to assist in a design problem

Biography

Zuowei Pei was born on Dalian, China. He received the master's degree in Cardiology from Dalian Medical University of China and the doctor degree in Cardiology from Ehime University of Japan. Experienced in post-doctoral research in cardiovascular medicine and basic medicine. He once worked in the Department of Cardiology of Beijing Hospital affiliated to Peking University, and now works in the Department of Cardiology, Central Hospital of Dalian University of Technology. He is major in at atherosclerosis, hyperlipidemia and cardiovascular drug research in basic research. In clinically, he is major in heart failure, coronary heart disease. He has published more than 40 research articles in SCI(E) journals.

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International Heart Congress



POSTERS



Dae Wook Lee

Medical Director and Medical Franchise Head, Cardiovascular, Metabolism, Neuroscience, and Gene Therapy Novartis Pharmaceuticals Korea

Innovative strategies in cardiovascular medicine: Enhancing spearhead excellence of new molecular entities

In the rapidly evolving landscape of healthcare, the role of Medical Affairs (MA) is increasingly pivotal in the successful launch of New Molecular Entities (NMEs). This abstract delves into the innovative approaches that are revolutionizing MA, specifically focusing on how these advancements contribute to launch excellence. The integration of cutting-edge technologies and data-driven strategies has emerged as a cornerstone in modernizing MA functions, thereby significantly impacting the launch trajectory of NMEs.

Firstly, the advent of digital platforms and Artificial Intelligence (AI) has transformed the way MA engages with key stakeholders. AI-driven tools facilitate the analysis of large datasets, enabling MA teams to derive actionable insights regarding healthcare trends, patient needs, and prescriber behaviors. This data-centric approach ensures that MA activities are strategically aligned with market dynamics and stakeholder expectations, thereby optimizing the launch process.

Secondly, the use of advanced analytics in MA has enhanced evidence generation and dissemination. Real-World Evidence (RWE) and big data analytics allow for a more comprehensive understanding of the drug's performance in real-world settings, thus providing robust evidence to support the value proposition of the NME. This evidence is crucial for payers, healthcare providers, and patients, influencing their decision-making processes and adoption rates.

Moreover, the application of digital health tools in MA has revolutionized scientific communication and engagement strategies. Virtual platforms enable MA teams to disseminate scientific information more efficiently, facilitate peer-to-peer interactions, and provide continuous medical education. These digital engagements ensure broader reach and deeper impact, crucial for building trust and credibility among the medical community during the NME launch phase.

In conclusion, the innovative modernization of medical affairs is a key driver in elevating the launch excellence of new molecular entities. By leveraging AI, advanced analytics, and digital health technologies, MA can effectively navigate the complexities of the healthcare environment, ensuring that NMEs are launched with maximum impact and success.

Audience Take Away Notes

- Provide comprehensive overview on genomic landscape in Cardiology
- Innovative Medicine with latest Research in Cardiology
- Sharing of advancement of future new indications for drug discovery using A.I. and digital technology

Biography

Dr. Dae Wook Lee is a Medical Director of Novartis Korea in Cardiology, Renal, Metabolism, and Gene Therapy. He was Head of Medical Portfolio Management in Rare disease, Gastroenterology, PDT, Neuroscience and New Molecular entities from the Asia-Pacific Region of Takeda Pharmaceutical Ltd Pte. Dae Wook Lee obtained his Medical Degree

from the University of Warwick, U.K. awarded MbChB Medicine & Surgery, and completed MSC Genetic Epidemiology at the Medical Research Unit in the University of Sheffield, U.K with an additional BSc Biomedical Science degree. He also holds an Executive Master of Business Administration (MBA) for Harris College of Business, Faulkner University in North Alabama in U.S. Dae Wook received the Best Research Award in the International Research Awards of Cardiology and Cardiovascular Medicine in 2022.



Faizah Albalawi*, Sulaiman Alalawi, Dipak P. Ramji
Cardiff School of Biosciences, Cardiff University, Cardiff, United Kingdom

Anti-atherogenic actions of punicalagin and its metabolites

Atherosclerotic Cardiovascular Disease (ACVD) is responsible for most global morbidity and mortality, contributing to a third of all deaths worldwide. ACVD is a low-grade chronic inflammatory disorder of the vasculature that is associated with build-up of lipids, cellular debris and immune cells. Risk factors for ACVD include high plasma cholesterol levels, hypertension, diet rich in saturated fats, high systemic markers of inflammation, sedentary lifestyle, diabetes, and obesity. It is expected that deaths from ACVD will increase in the future because of rise in such risk factors, particularly in developing countries. Current pharmaceutical therapies for ACVD are not fully effective, demonstrating patient-dependent efficacy, and are associated with various side effects. Nutraceuticals represent promising alternatives as preventatives or therapeutic agents against ACVD but the molecular mechanisms underlying their protective actions are poorly understood.

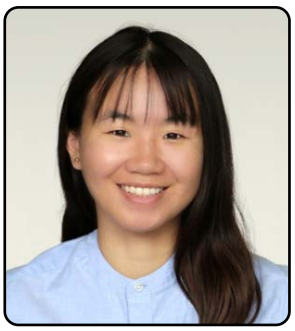
Punicalagin (PC) is an ellagitannin, a type of phenolic compound, that is abundant in pomegranate and pomegranate juice. PC is a strong antioxidant and demonstrates anti-inflammatory and anti-atherogenic actions. PC is large and lipophilic and hence metabolised in the body into ellagic acid and urolithins. The actions of PC, ellagic acid and urolithins on atherosclerosis and risk factors associated with the disease, together with the underlying molecular mechanism, are poorly understood. We have investigated these using a range of cell culture model systems (e.g., human monocytes/macrophages, endothelial cells, smooth muscle cells, hepatocytes) in vitro and/or in low-density lipoprotein receptor deficient mice fed a high fat diet for 12-weeks in vivo. The findings from these studies will be presented in the context of published research and future directions.

Audience Take Away Notes

- The audience will learn about how nutraceuticals, and particularly ellagitannins such as punicalagin and its metabolites, can prevent and treat cardiovascular disease
- The research-led knowledge from the presentation will positively impact their jobs
- The research could be used by other faculty to expand their research or teaching, particularly in relation to functional foods, nutraceuticals and cardiovascular disease
- The research could impact therapeutic options available in cardiovascular disease
- The research could lead to further studies aimed at punicalagin and its metabolites in the prevention and treatment of heart disease

Biography

Faizah Albalawi is a lecturer at Tabuk university. She received her BSc degree (Biomedical laboratories technology) from Taibah university and her Master (biomedical science) from University of salfored Manchester in 2015. She has worked as a lecture at Tabuk University from 2013 till 2021. Now, She is a PhD student at Cardiff university, supervised by Dipak. She published a review at last May in Anti-atherogenic actions of punicalagin and its metabolites in IJMS.



Grace Qiu[1]*, Roman Marchenko[2], Behzad Pavri[2]

[1]Sidney Kimmel Medical College, Thomas Jefferson University, Philadelphia, PA, United States

[2]Division of Cardiology, Thomas Jefferson University Hospital, Philadelphia, PA, United States

Does conduction system pacing preserve left ventricular ejection fraction and prevent the development of dyssynchronous cardiomyopathy?

Background: It is well known that conventional Right Ventricular (RV) pacing results in left ventricular dyssynchrony. Approximately 30% of patients with normal baseline Ejection Fraction (EF) and >40% of RV pacing will go on to develop cardiomyopathy and heart failure. Conduction System Pacing (CSP) is now increasingly used as a mode of resynchronization to correct dyssynchronous heart failure. However, guidelines do not recommend resynchronization pacing for patients with preserved EF, and there are few data to show that preemptive CSP in such patients prevents development of cardiomyopathy.

Methods: We reviewed electronic medical records of all patients with normal baseline EF with anticipated high percentage of ventricular pacing who received CSP devices, had >90% ventricular pacing, and had a minimum of 3 weeks of follow up. Baseline clinical characteristics and EF were collected and compared to latest follow-up data.

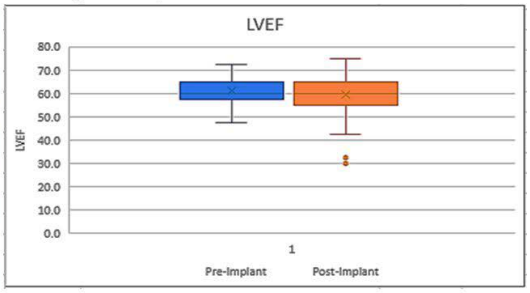
Results: A total of 50 patients were included (24 his bundle and 26 left bundle branch area pacing).

Baseline characteristics are shown in table 1. At a mean follow-up of 516+523 (range 15-2,066) days there was no significant change in EF (61±5% vs 60±8%, p=0.11) or left ventricular end diastolic diameter (4.5±0.7 vs. 4.4±0.6 cm, p=0.24) despite a high percentage (91%) of pacing (Table 2).

Conclusions: CSP preserves EF over medium-term follow-up and prevents development of dyssynchronous heart failure. If validated in larger cohorts with longer follow up, CSP should be considered as the pacing modality of choice in patients with anticipated high percentage of ventricular pacing, even when baseline EF is normal.

Table 1. Clinical characteristics at baseline	
Age, years ± SD	75 ± 10
Female sex, n (%)	14 (28)
CAD, n (%)	19 (38)
Hypertension, n (%)	41 (82)
CKD, n (%)	17 (34)
Beta-blocker use, n (%)	22 (44)
ACEI use, n (%)	6 (12)
ARB-use, n (%)	14 (28)
Sacubitril-valsartan use, n (%)	0 (0)
MRA use, n (%)	3 (6)
SGLT2I use, n (%)	1 (2)
Baseline QRS duration, ms ± SD	126 ± 32
Baseline LVEF, % ± SD	61 ± 5
Baseline LVEDD, cm ± SD	4.5 ± 0.7

Table 2. Follow up data	
Duration of follow up, days ± SD	516 ± 523
Paced QRS duration, ms ± SD	120 ± 25
% ventricular pacing, % ± SD	91 ± 21
Follow up LVEF, % ± SD	60 ± 8
Follow up LVEDD, cm ± SD	4.4 ± 0.6



SD – standard deviation, CAD – coronary artery disease, CKD – chronic kidney disease, ACEI – angiotensin converting enzyme inhibitor, ARB – angiotensin receptor blocker, MRA – mineralocorticoid receptor antagonist, SGLT2I – sodium-glucose cotransporter 2 inhibitor, LVEF – left ventricular ejection fraction, LVEDD – left ventricular end diastolic diameter

Audience Take Away Notes

- CSP preserves EF over medium-term follow-up and prevents development of dyssynchronous heart failure. If validated in larger cohorts with longer follow up, CSP should be considered as the pacing modality of choice in patients with anticipated high percentage of ventricular pacing, even when baseline EF is normal

Biography

Grace Qiu studied Biochemistry at the University of Wisconsin-Madison, USA and graduated as BS in 2022. She then started medical school at Sidney Kimmel Medical College at Thomas Jefferson University, USA in 2022.

S. Barbouch[1,2]*, S. Mekki[1], S. Badrouchi[1], S. Agerbi[1], M. Hajji[1], F. Ben Hmida[1,2], E. Abderrahim[1]

[1]Department of medicine A, Charles Nicolle Hospital, Tunis, Tunisia
[2]Laboratory of renal pathology LR00SP01, Charles Nicolle Hospital, Tunis, Tunisia

Ambulatory blood pressure monitoring in patients with diabetic nephropathy

Diabetic Nephropathy (DN) is the main cause of renal failure worldwide. DN is often associated with high Blood Pressure (BP), and these two pathologies seem to maintain each other. However, the impact of this nephropathy on the fluctuations of blood pressure is not well established. We conducted a case-control study over one year, considering patients who had a valid Ambulatory Blood Pressure Measurement (ABPM) in our department. Patients with end-stage renal disease were excluded. Twenty-five patients with DN were compared with control groups. A first group of 25 diabetic patients with no kidney disease, and a second group of 50 patients with Chronic Kidney Disease (CKD) and no diabetes.

Among diabetic patients, DN was associated with higher systolic BP (151 ± 16 mmHg versus 127 ± 10 mmHg; $p < 0.001$), but there was no difference in the diastolic BP (78 ± 12 mmHg versus 73 ± 9 mmHg; $p = 0.43$). The prevalence of systolic and/or diastolic hypertension was higher in cases of DN ($p=0.013$). In addition, a reverse dipper pattern, was frequently observed in cases of DN (32% versus 2%, $p= 0.002$). Among CKD patients, DN was associated with higher systolic BP (151 ± 16 mmHg versus 135 ± 17 mmHg; $p = 0.001$) and similar diastolic BP (78 ± 12 mmHg versus 82 ± 8 mmHg $p = 0.25$). The prevalence of hypertension was comparable. However, patients with ND had more abnormal BP rhythm which is reverse dipper (32% versus 8%, p value = 0.004). Diabetic nephropathy impacts more the systolic value of blood pressure than the diastolic value. It is also correlated with reverse dipper patterns present in third of patients.

Audience Take Away Notes

- This presentation helps with the understanding and management of hypertension in cases of diabetic nephropathy
- Understanding the relationship between high blood pressure and diabetic nephropathy is vital for healthcare providers to develop comprehensive treatment plans that effectively manage both conditions
- Then risks of developing complications associated with diabetic nephropathy can be minimized

Biography

Dr. Barbouch was graduated from The Faculty of Medicine of Tunis, Tunisia. Then she worked in the Faculty of Medicine of Tunis and in the department of medicine A in Charles Nicolle Hospital in Tunis, as an assistant physician, then as an associate professor and since 2020 as a professor in nephrology. She also participated in working group of the national society of nephrology, dialysis, and renal transplantation (STNDT). Since 2021, she became the president of the national college of nephrology in Tunisia. She has more than 290 publications about hypertension, interstitial nephritis, secondary peritonitis, kidney transplant, and parathyroidectomy.

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Investigating the therapeutic efficacy, safety, and long-term impact of sacubitril valsartan in treating hypertrophic cardiomyopathy

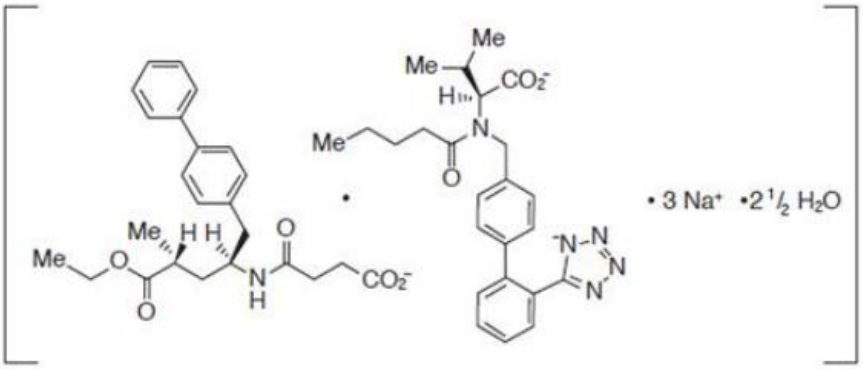
Background: This study aims to evaluate the efficacy, safety, and long-term effects of sacubitril/valsartan in treating hypertrophic cardiomyopathy using a hypertrophic cardiomyopathy rat model and in vitro cardiomyocytes. Hypertrophic cardiomyopathy presents a challenge in cardiac disease treatment. This research aims to explore the potential role of sacubitril/valsartan in treating hypertrophic cardiomyopathy, offering novel therapeutic strategies for this condition.

Methods and Materials: Experimental groups were established using a hypertrophic cardiomyopathy rat model (400±10g, n=9 per group), with the treatment group receiving sacubitril/valsartan and the control group receiving a placebo. In vitro cultured cardiomyocytes were exposed to different concentrations (0mg, 25mg, 50mg, 75mg, 100mg, 200mg, 500mg, and 750mg/kg/day) of sacubitril/valsartan. Measurements included myocardial hypertrophy, cardiac function indices, and cell assay data.

Results: The left and right myocardial hypertrophy index and myocardial cell diameter of the treatment group were lower than those of the control group, which were (1.04±0.21 vs 1.38±0.15), (0.34±0.08 vs 0.46±0.09), (15.23±1.67 vs 19.82±2.01) μm, respectively. The differences were statistically significant ($P < 0.05$). Echocardiography showed that the Left Ventricular End-Diastolic Diameter (LVEDD) and Left Ventricular End-Systolic Diameter (LVESD) in the treatment group were lower than those in the control group, which were (2.03±0.36 vs 4.26±0.54) mm and (1.74±0.83 vs 3.57±0.83) mm, respectively. The differences were statistically significant ($P < 0.05$). The levels of troponin, myocardial kinase isoenzyme and lactate dehydrogenase in the drug treated group were lower than those in the control group (234.56±31.24 vs 412.89±21.36) pg/ml, respectively. (67.98±10.56 vs 98.65±13.27) U/L, (124.78±31.24 vs 214.67±28.79) U/L, the differences were statistically significant ($P < 0.05$).

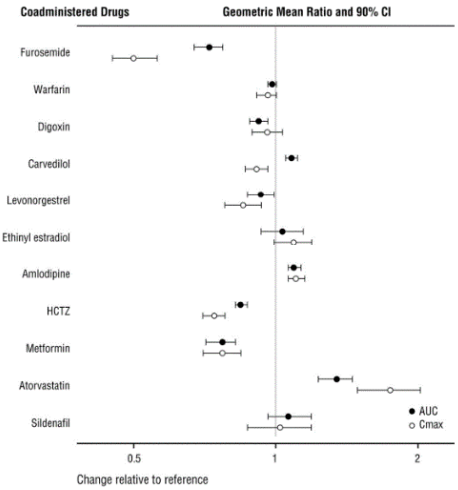
Conclusion: Sacubitril/valsartan exhibits promising therapeutic potential; however, further clinical studies are required to validate its exact efficacy in treating hypertrophic cardiomyopathy. These preliminary results offer hope for its potential as a treatment and provide a foundation for future clinical investigations.

Figure: 1



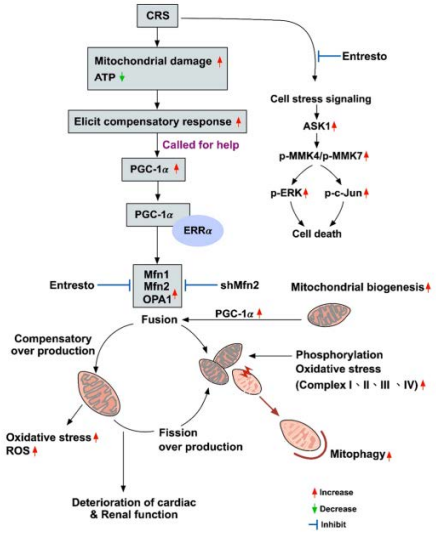
ENTRESTO is available as film-coated tablets for oral administration, containing 24 mg of sacubitril and 26 mg of valsartan; 49 mg of sacubitril and 51 mg of valsartan; and 97 mg of sacubitril and 103 mg of valsartan.

Figure: 2



Effect of ENTRESTO on pharmacokinetics of coad ministered drugs.

Figure: 3



The mechanism of entresto for protecting the cardiomyocytes and preserving the heart function through regulating the oxidative stress.

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