The 62nd Annual Scientific Meeting of The Korean Society of Cardiology

대한심장학회 THE KOREAN SOCIETY OF CARDIOLOGY 심장학연구재단 THE KOREAN CARDIAC RESEARCH FOUNDATION

KSC 2018 Daily

2018. 10. 12. Friday

Today's Highlights

Transforming Clinical Trials and Registry in CVD
08:40-10:10 AM
Rm. Grand 1

New Frontiers in Cardiology 2
Evolving and Emerging Issue in Cardiology
10:20-11:50 AM
Rm. Theatre

Cross Specialty 2: Intervention & Heart Failure
Interventional Heart Failure Therapy
10:20-11:50 AM
Rm. Grand 1

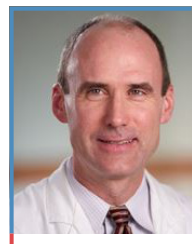
TSOC-KSC Joint: Arrhythmia
Basic Mechanism of Arrhythmia
10:20-11:50 AM
Rm. Walker 1

Late Breaking & Featured Research from Asia-Pacific 2
14:00-15:30 PM
Rm. Grand 1

E-Poster Session
08:40 AM-17:10 PM
Rm. Vista (B2, B3)

New Frontiers in Cardiology 2

The Evolving and Emerging Concept of Antiplatelet Therapy after PCI



Matthew Todd Roe, MD
Duke Clinical Research Institute, USA

The evolution of antiplatelet therapy after percutaneous coronary intervention (PCI) has occurred over the past 25 years since coronary stent implantation was introduced into practice in the early 1990s. At that time, patients undergoing balloon angioplasty alone were treated with aspirin monotherapy after PCI, but there was a high risk of vessel re-occlusion and lesion-related ischemic events with balloon angioplasty alone. Coronary stent implantation significantly reduced the risk of these post-PCI complications, but introduced new post-PCI complications including stent thrombosis and in-stent restenosis. Initial treatment regimens following bare metal stent (BMS) placement added high doses of oral anticoagulants to aspirin and contributed to high rates of major bleeding complications and extended hospital lengths of stay. Subsequent pioneering studies demonstrated that high-pressure balloon inflation during BMS implantation and dual antiplatelet therapy (DAPT: aspirin + P2Y12 inhibitor: ticlopidine or clopidogrel) reduced the risks of stent thrombosis dramatically but the optimal duration of DAPT following PCI remained unresolved. This issue resurfaced many years later once drug eluting stents (DES) were introduced into practice and demonstrated a lower risk of in-stent restenosis but a higher risk of stent thrombosis after cessation of DAPT. Subsequent observational studies demonstrated that at least 12 months of DAPT was needed following PCI with DES to reduce the risk of stent thrombosis but this duration of treatment was associated with higher bleeding risks, particularly among vulnerable patients with comorbidities. Meanwhile, DES technology evolved and multiple trials were performed that demonstrated that DAPT regimens <12 months appeared to be safer (with a lower risk of bleeding) without a rebound risk of ischemic events after DAPT cessation. Consequently, practice guidelines following elective PCI and acute coronary syndrome (ACS) PCI have evolved to endorse DAPT regimens <12 months following PCI with DES for certain patient subgroups to reduce bleeding risks. Finally, a recent trial (GLOBAL LEADERS) showed that P2Y12 monotherapy with ticagrelor following 1 month of DAPT after elective PCI and ACS PCI was associated with no increased risk of composite ischemic events and potentially a slightly lower risk of major bleeding. Thus, the evolution of antiplatelet therapy after PCI has showcased the iterative knowledge acquisition needed to optimize the antiplatelet types and regimens to reduce ischemic events but not increase bleeding events to an unacceptable threshold.

The Evolving and Emerging Concept of AF Ablation

Chun Hwang, MD
Utah Valley Regional Medical Center, USA

In 1994, the first successful feasibility study for the catheter based atrial fibrillation ablation was reported. Since then, there have been many technological progresses for mapping and ablation of atrial fibrillation that changed ablation practices including the worldwide general consensus and guidelines. In the last decade, ablation strategies were primarily focused on the cardiac veins origin mechanism for all forms of atrial fibrillation and pulmonary vein isolations (PVI) have been accepted as the mainstay of the procedure. However, there have been no significant improvement in short or long-term outcomes of catheter based atrial fibrillation ablation and continues to face significant recurrences. This in part due to the empiric cardiac vein isolations without detailed anatomical definition of PV antral or ostial region using preset ablation power that often associated with cardiac vein reconnection post ablation follow-up. The empiric pulmonary vein isolation for all forms of atrial fibrillation is convenient and practical but may not be enough for those patients who has variant cardiac vein substrate. Therefore, the wide range of anatomical variations and the scars associated atrial myocardial remodeling are not considered during empiric cardiac vein isolation strategy. Currently used anatomical term of pulmonary vein ostium, antrum or wide antrum are ill defined, therefore subject to wide range of interpretation among ablation practicing professionals, and

Continued on page 7

Program at a glance: Day 2, Oct 12, 2018

	Theatre (B1)	Grand 1 (B1)	Grand 2 (B1)	Grand 3 (B1)	Grand 4 (B1)	Grand 5 (B1)	Walker 1 (1F)	Walker 2 (1F)	Cosmos (3F)	Calla (3F)	Vista (B2)	Vista (B3)
08:40 - 10:10	**LIVE 1 Endovascular**	**Transforming Clinical Trials and Registry in CVD**	**Young Investigator Award Competition 1** 1-6	**Young Investigator Award Competition 2** 7-12	**Oral Abstracts CAD 5** 91-96	**Cardiac Surgery 1** Current Controversy in Aortic Disease	**Arrhythmia 3** VT Summit	**Echo 3** New Insights Provided by USA Experts	**Vascular 1** In-depth Review in Aortic Aneurysm	**Oral Abstracts Pediatric Cardiology 1** 97-102	**Oral Abstracts Basic Research 2** 103-108 (Case & Abstract Zone 1)	**E-Poster** 1-197
10:20 - 11:50	**New Frontiers in Cardiology 2** Evolving and Emerging Issue in Cardiology	**Cross Specialty 2: Intervention & Heart Failure** Interventional Heart Failure Therapy	**Young Investigator Award Competition 3** 13-18	**Young Investigator Award Competition 4** 19-24	**Oral Abstracts Arrhythmia 4** 109-114	**Oral Abstracts CAD 6** 115-120	***TSOC-KSC Joint (Arrhythmia)** Basic Mechanism of Arrhythmia	**Echo 4** Interesting Cases from Diverse Institutions 1	**Vascular 2** Heart & Vessel	**Oral Abstracts Pediatric Cardiology 1** 121-126	**Oral Abstracts Basic Research 3** 127-132 (Case & Abstract Zone 1)	
12:00 - 12:40	**Scientific Session [Pfizer/BMS]**	**Diamond Session [Bayer]**					**Scientific Session [MSD]**	**Scientific Session [Boryung]**	**Scientific Session [Samjin]**			
12:40 - 14:00											**Mini Oral Zone 1** 32-39 / **Case Zone 1** 29-35 / **Mini Oral Zone 2** 40-47 / **Case Zone 2** 36-42	**Mini Oral Zone 3** 48-56 / **Case Zone 3** 43-49 / **Mini Oral Zone 4** 57-65 / **Case Zone 4** 50-56
14:00 - 15:30	**LIVE 2 Coronary**	**Late Breaking & Featured Research from Asia-Pacific 2**	**Pediatric Cardiology 1** Management Strategy for the Neonate Associated CHD	****BESCO 1** Biomedical Engineering Society for Circulation 1	**Oral Abstracts CAD 7** 133-138	**Cardiac Surgery 2** Updates in Coronary Artery Bypass Surgery	**Arrhythmia 4** Guideline Session & PSVT	**Nurse-Technician Session 1** (14:00-14:50) Special Lecture	**Oral Abstracts Intervention 4** 139-144	**Oral Abstracts Echo 1** 145-150		**E-Poster** 1-197
15:40 - 17:10	**LIVE 3 Structural Heart Disease**	**환자중심의 공익적 임상연구를 위한 포럼** 환자중심 의료기술 최적화 연구	**Pediatric Cardiology 2** Cardiac Imaging - Anatomy to Physiology	****BESCO 2** Biomedical Engineering Society for Circulation 2	**Oral Abstracts Imaging** 151-156	**Oral Abstracts CAD 8** 157-162	**Oral Abstracts Arrhythmia 5** 163-168	**Nurse-Technician Session 2** (14:50-16:00) Congenital & Valvular Disease Intervention / **Nurse-Technician Session 3** (16:00-17:00) Interesting TAVI Case	**Oral Abstracts Intervention 5** 169-174	**Oral Abstracts Women Heart Disease** 175-180	**Oral Abstracts Heart Failure 3 Disease** 181-186 (Case & Abstract Zone 1)	
17:10	총회											

*TSOC: Taiwan Society of Cardiology
**BESCO: Biomedical Engineering Society of Cardiology

Scientific & Diamond Sessions

Scientific Session 4 [Pfizer/BMS]
Expanding Our Knowledge of Patient Care with Cardio Vascular Disease (Dyslipidemia & Stroke Prevention in Arterial Fibrillation)
›› Oct 12, 12:00-12:40 PM Rm. Theatre

Scientific Session 5 [MSD]
Protecting Patients with CVD in the Future
›› Oct 12, 12:00-12:40 PM Rm. Walker 1

Scientific Session 6 [Boryung]
Advances in the Management of Hypertensive Patients
›› Oct 12, 12:00-12:40 PM Rm. Walker 2

Scientific Session 7 [Samjin]
Cutting Edge of Incrementally Modified Drugs & Combinations in NOAC and Circulation Disease Medicine
›› Oct 12, 12:00-12:40 PM Rm. Cosmos

Diamond Session [Bayer]
Addressing Unmet Needs in the Treatment of High Risk of CVD
›› Oct 12, 12:00-12:40 PM Rm. Grand 1

Myocardial Infarction Symposium

High-intensity Statins or Non-statin Combination in AMI: Which Do You Prefer?

Doo Sun Sim, MD, PhD
Chonnam National University Hospital, Korea

Statin therapy in patients with acute coronary syndrome (ACS) reduces mortality, myocardial infarction (MI), stroke, and the need for coronary revascularization, and many data support early use of intensive statin treatment.

Higher-risk patients benefit more from high-intensity statins as shown in the Pravastatin or Atorvastatin Evaluation and Infection Therapy-Thrombolysis In Myocardial Infarction 22 (PROVE IT-TIMI 22) and Myocardial Ischemia Reduction With Acute Cholesterol Lowering (MIRACL) trials. Therefore, Dr. Sim explains that it is recommended initiating high-intensity statin therapy early after admission in all patients with ACS, the treatment goal being a low-density lipoprotein cholesterol (LDL-C) of <70 mg/dL or at least 50% reduction of LDL-C if the baseline level is between 70 and 135 mg/dL.

Nevertheless, high-intensity statin therapy has not been extensively utilized in East Asians, possibly due to the paucity of randomized trials and a concern for the safety and tolerability of high-intensity statins. Retrospective studies in Korean patients with acute MI revealed that the majority of patients received low-to-moderate intensity statins and clinical outcomes at 12 months were similar between patients receiving high-intensity statins and low-to-moderate intensity statins. Recently, however, the Randomized Evaluation of Aggressive or Moderate Lipid Lowering Therapy With Pitavastatin in Coronary Artery Disease (REAL-CAD) study for Japanese patients with stable coronary artery disease demonstrated that high-dose compared to low-dose pitavastatin significantly reduced the risk of cardiovascular death, MI, ischemic stroke, or unstable angina without difference in the risk of adverse side effects.

Despite the unequivocal benefits of statin therapy, statins are underutilized in high-risk patients especially those with lower LDL-C levels. Moreover, most patients still do not attain an LDL-C goal of <70 mg/dL even among those on high-intensity statins. Possible barriers include patient noncompliance, physician nonadherence to current guidelines, intolerance to statins, and the lack of effective lipid-lowering regimens to permit patients to reach LDL-C target. In real practice, clinicians may need to use combination therapy more often if an LDL-C goal is to be achieved. For patients who have not attained the expected 50% reduction in LDL-C or whose LDL-C remains >70 mg/dL after ACS despite a maximally tolerated dose of statin, further LDL-C lowering with a non-statin agent such as ezetimibe or a proprotein convertase subtilisin/kexin type 9 (PCSK 9) inhibitor should be considered based on the results of Improved Reduction of Outcomes: Vytorin Efficacy International Trial (IMPROVE-IT) and Further Cardiovascular Outcomes Research with PCSK9 Inhibition in Subjects with Elevated Risk (FOURIER) trials.

Acute Cardiogenic Shock: Culprit-only vs. Immediate Multivessel PCI

Chang-Hwan Yoon, MD
Seoul National University Bundang Hospital, Korea

In Korea, primary percutaneous coronary intervention (PCI) with drug-eluting stent (DES) implantation is a standard treatment strategy for ST-segment elevation myocardial infarction (STEMI) reaching over 90% of all the admitted patients with STEMI. Among the STEMI patients, 5-10% of patients present with cardiogenic shock, and have higher in-hospital mortality than patients without cardiogenic shock. The unstable hemodynamic condition often results in suboptimal results of PCI and commonly increased mortality during PCI. Nearly half of STEMI patients have concomitant stenosis in non-infarct related artery (IRA), and those patients have been well known to show worse prognosis than those without non-IRA stenosis. Nevertheless, routine multivessel PCI for non-IRA stenosis in STEMI patients was once considered inappropriate. However, in recently published randomized trials, STEMI patients who underwent multivessel PCI showed significantly better outcomes compared with IRA-only PCI. Based on these results, the latest European guideline recommends multivessel PCI as a class IIa recommendation in STEMI patients. Although the guideline emphasizes the importance of complete revascularization in STEMI patients with cardiogenic shock, supporting evidence has been scarce and the recommendation was mainly based on expert consensus and pathophysiologic considerations. Although several previous observational studies compared clinical outcomes between multivessel PCI and IRA-only PCI in STEMI multivessel disease with cardiogenic shock, the results were inconclusive. Recently, the Culprit Lesion Only PCI Versus Multivessel PCI in Cardiogenic Shock (CULPRIT-SHOCK) trial reported 30-day clinical outcomes of 685 patients with STEMI with multivessel disease and cardiogenic shock who were randomly allocated into an angiography-guided immediate multivessel PCI or IRA-only PCI group. At 30 days, the multivessel PCI group showed significantly higher risk of all-cause death or new renal replacement therapy compared with the IRA only PCI group. A Korean group also investigated the impact of multivessel PCI for non-IRA stenosis in STEMI patients, who had multivessel disease and were accompanied by cardiogenic shock using a large-scaled nationwide, multicenter, prospective registry dedicated for acute myocardial infarction. The risk of all-cause death and non-IRA repeat revascularization was significantly lower in the multivessel PCI group than in the IRA-only PCI group. As real-world data reflecting contemporary practice, the results of this study support the current recommendation of the guidelines. To avoid fatal complication during multivessel PCI in patient with STEMI and cardiogenic shock, several clinical and technical points should be considered which will be addressed in this lecture based on cases.

Myocardial Infarction 2
Therapeutic Decisions beyond Guideline
›› Thursday, Oct 11, 10:20-11:50 AM / Grand 5

Vascular Symposium

Complex Pathophysiology of Aortic Aneurysms

Alan Daugherty, PhD
University of Kentucky, USA

Aortopathies of aneurysms and dissections are life-threatening diseases that have no validated medical therapy. The aorta is a conduit of considerable heterogeneity in many aspects including hemodynamics, extracellular matrix composition, vasa vasorum distribution, adventitial components (adipose, fibroblasts) and embryonic origins of smooth muscle cells. Regional specificity of aortic aneurysms and dissections has been observed in many experimental models. One of the most commonly used model of aortopathies employs chronic subcutaneous infusion of angiotensin II in normo and hypercholesterolemic mice. This procedure promotes formation of aortopathies that are localized to the ascending and suprarenal regions that have distinct pathological features. In the suprarenal aortic region, aneurysms form due to an initial focal transmural medial rupture. In the ascending aorta, angiotensin II infusion leads to profound expansion of the lumen with medial thickening and almost concentric elastin fragmentation. In contrast, the incidence of aneurysms during angiotensin II infusion is low in the descending thoracic aorta, and absent in the infrarenal aorta. The development of aortopathies is unrelated to changes in blood pressure. While it has been well-characterized that the AT1a receptor stimulation determines the development of aortopathies, responses of the aortic media to angiotensin II also have not been correlated to the localization of pathology in both *in vitro* and *in vivo* studies. Although aortopathies in both the ascending and suprarenal regions are characterized by profound medial changes, cell-specific deletion of AT1a receptors in smooth muscle cells has no effect on development of aortic aneurysms. In contrast, deletion of AT1a receptor in fibroblasts attenuates angiotensin II-induced aortic aneurysms in both the ascending and suprarenal regions. Current studies are elucidating whether the characteristics of smooth muscle cells of specific embryonic origins, in combination with regional variances of extracellular matrix, provide a rationale for the development of aneurysms and dissections in distinct aortic locations.

Vascular 1
In-depth Review in Aortic Aneurysm
›› Friday, Oct 12, 08:40-10:10 AM / Cosmos

Late Breaking & Featured Research from Asia-Pacific 2

Dual Stem Cell Therapy Synergistically Improves Cardiac Function and Vascular Regeneration Following Myocardial Infarction

Hun-Jun Park, MD, PhD
Catholic University Seoul St. Mary's Hospital, Korea

Since both myocardium and vasculatures in the heart are excessively damaged following myocardial infarction (MI), therapeutic strategies for treating MI hearts should be to concurrently rejuvenate all that together for achieving true cardiac repair. In this perspective, the Dr. Park and his team developed a multipronged approach aiming to concurrently rejuvenate both the myocardium and vasculatures utilizing both human induced pluripotent stem cell derived cardiomyocytes (iPSC-CMs) and human mesenchymal stem cells (MSCs). MSCs have long been considered a promising candidate for cell based therapy owed to their beneficial paracrine factors such as vascular endothelial growth factor (VEGF), fibroblast growth factor 2 (FGF2), and hepatocyte growth factor (HGF) that promote angiogenesis, neovascularization, and cell survival. MSCs are also known to secrete potent anti-fibrotic factors including matrix metalloproteinases 2, 9, and 14 which inhibit the proliferation of cardiac fibroblasts thereby attenuating fibrosis. In tandem, human pluripotent stem cells (PSC), which include both embryonic stem cells and iPSC, are propitious due to their similarities with primary CMs apposite to expressions of cardiac specific genes, structural proteins, and ion channels as well as spontaneous contraction. This study by Dr. Park and his team demonstrated that epicardially implanted MSC patches provided a complimentary microenvironment which enhanced vascular regeneration through prolonged secretion of paracrine factors, but more importantly it improved the retention and engraftment of intramyocardially injected PSC-CMs which ultimately restored the cardiac function **(Figure 1)**. Notably, the majority of injected PSC-CMs neighboring MSC-PA displayed a rectangular-shaped adult CMs like morphology suggesting that the secretomic milieu of MSC patches constitutes pleiotropic effects.

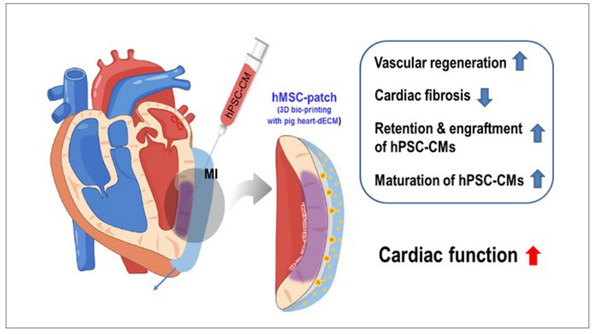


Figure 1. Complimentary microenvironment created by MSC patches

Global Longitudinal Strain to Predict Mortality in Patients with Acute Heart Failure

Goo-Yeong Cho, MD, PhD
Seoul National University Bundang Hospital, Korea

Currently, heart failure (HF) is classified according to ejection fraction (EF), which has long been synonymous with the left ventricular (LV) contractile function. However, this simple measurement is a rather crude measurements, even in the best of circumstances, we need more precise technique for evaluating ventricular function that may serve as a more sensitive marker of diagnosis and prognosis. Myocardial strain can assess myocardium itself and provides incremental diagnostic and prognostic information in a wide variety of clinical settings. We investigated whether classification of HF according to myocardial strain may better predict mortality than EF based phenotype. We enrolled 4,312 patients who were admitted for acute HF and measured global longitudinal strain (GLS). The feasibility of GLS was 98.7%. Regarding phenotype, 51%, 15%, and 32% patients had HF with reduced EF, mid-ranged EF, and preserved EF. Although correlation between EF and GLS was highly significant (r=0.69, p<0.001), GLS was widely distributed at a given EF. During median follow up of 31.7 months, 40.4% of patients had died at 5 years. Each of the two parameters were able to significantly predict mortality. However, in restricted cubic splines, mortality decreased with decreasing strain, whereas the relationship between mortality and EF was not prominent **(Figure 2)**. In conclusion, because GLS has greater prognostic value than EF, GLS should be considered as the standard measurement in all patients with HF. This study was the largest study to investigate the prognostic significance of global longitudinal strain ever and should help convince those who are still in doubt about the clinical utility of strain analysis.

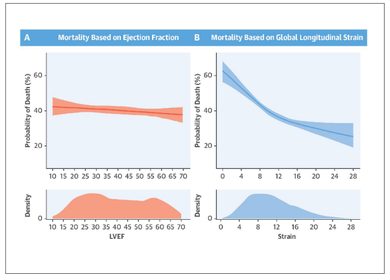


Figure 2. Prognostic value of strain in acute heart failure: Probability plot for 5-year all-cause mortality

Late Breaking & Featured Research from Asia-Pacific 2
›› Friday, Oct 12, 14:00-15:30 PM / Grand 1

TSOC-KSC Joint Symposium: Basic Mechanism of Arrhythmia

The Role of AV Nodal Angiography in Ablation of AVNRT

Wen-Chin Ko, MD
Cathay General Hospital, Taiwan

Radiofrequency catheter ablation (RFCA) of atrioventricular nodal reentry tachycardia (AVNRT) confers a risk of atrioventricular block. Therefore, detailed landmark of atrioventricular (AV) node and surrounding structure is important for safe and effective RFCA of AVNRT. In the TSOC-KSC Joint Symposium, Dr. Wen-Chin Ko will give us a talk titled "The Role of AV Nodal Angiography in Ablation of AVNRT". In this session, Dr. Wen-Chin Ko will share his knowledge and experience on how to avoid critical damage to the AV node and its feeding artery, rare but serious complications during RFCA of AVNRT.

AV Node-Anatomy & Pathology

Il-Young Oh, MD
Seoul National University Bundang Hospital, Korea

It has been more than 100 years since the discovery of atrioventricular node (AVN) by Suanao Tawara. Since the discovery of AVN, great strides on knowledge regarding structure and function of AVN have led us not only to better understanding of arrhythmias but also to more effective treatments. Until now, appreciating anatomy of AVN remains as a cornerstone for successful treatment of cardiac arrhythmias. Despite of the numerous advances, there are still several controversies on AVN. Recent advances in technologies will aid our further understanding of this specialized part of the heart and Dr. Il-Young Oh will give us a lecture on recent advance in immunohistochemistry of AVN and studies on AVN using the SBF-SEM (serial block-facing scanning electron microscopy) method.

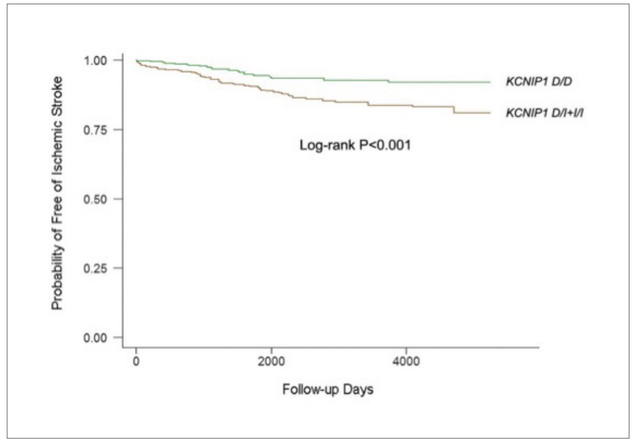
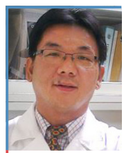


Figure 1. Patients carrying the insertion allele in the KCNIP1 gene were more likely to develop thromboembolic stroke than non-carriers (Log-rank p<0.001).

A Common Copy Number Variation in Potassium Interacting Channel 1 Gene is a Genetic Predictor of Atrial Fibrillation and Atrial Fibrillation Associated Ischemic Stroke



Chia-Ti Tsai, MD, PhD
National Taiwan University, Taiwan

Atrial fibrillation (AF) has not been considered as a genetic condition. However, several recent studies have demonstrated that AF has a substantial genetic basis. Mutations in several ion channels have been identified in individuals with familial AF, although they appear to be rare causes of arrhythmia. Recently, a genome wide associated study has led to the identification of genetic variants associated with common forms of AF. Previous genome-wide association studies had identified single-nucleotide polymorphisms in several genomic regions associated with AF that may provide insights into the molecular mechanism of AF. In human genome, copy number variations (CNVs) are also known to contribute to disease susceptibility. A study using a genome-wide multistage approach to identify AF susceptibility CNVs by Chia-Ti Tsai et al. has identified that a common 4,470-bp diallelic CNV in the first intron of potassium interacting channel 1 gene (KCNIP1) is strongly associated with AF in the Taiwanese population (odds ratio=2.27 for insertion allele; $p=6.23\times10^{-24}$) and suggested possible functional mechanism of the genetic association using the zebrafish and cellular models. KCNIP1-encoded protein potassium interacting channel 1 (KCHIP1) was associated with potassium Kv channels and modulated atrial transient outward current in myocytes. Overexpression of KCNIP1 resulted in inducible AF in zebrafish. Additionally, in Taiwan AF longitudinal follow-up cohort, KCNIP1 insertion was associated with a higher risk of ischemic stroke **(Figure 1)**. Therefore, a common CNV in KCNIP1 gene may be a genetic predictor of AF risk as well as stroke risk possibly pointing to a functional pathway.

TSOC-KSC Joint Symposium
Basic Mechanism of Arrhythmia
›› Friday, Oct 12, 10:20-11:50 AM / Walker 1

Cross Specialty Session 2: Interventional Heart Failure Therapy

LA Venting in Cardiogenic Shock: Early Invasive vs. Conservative

Min Seok Kim, MD, PhD
Ulsan University Asan Medical Center, Korea

Venoarterial extracorporeal membrane oxygenation (VA-ECMO) has increasingly been used in refractory cardiogenic shock (CS). VA-ECMO supports end-organ perfusion while patients wait for long-term definite therapy or recovery of native cardiac function. However, the outcome of VA-ECMO in CS remains poor. The incidence of common complications such as bleeding, stroke, infection, acute kidney injury, and limb ischemia have been widely characterized. Among them, one of the most important concerns about VA-ECMO support is the rise of left heart pressure. The retrograde flow in the aorta toward the left ventricle (LV) can cause a marked increase in LV afterload. This deteriorates impaired LV function and causes inadequate opening of the aortic valve. The consequences of LV pressure overload result in increased left atrial (LA) pressure, pulmonary edema, ventricular arrhythmia, increased risk for LV thrombus formation, increased LV wall stress and increased myocardial oxygen demand, hindering the ability of LV to recover. Based on the above mentioned mechanisms, it is clear that unloading the LV during VA-ECMO may provide LV functional rest from the counter flow generated by the temporary cardiopulmonary support.

Currently, different techniques have been used to unloading the left heart **(Figure 1)**. Intra-aortic balloon pump (IABP) is the most commonly used; however, its use has not been associated with improved survival. The Abiomed Impella® device (Abiomed, Danvers, MA) has been also used to unload the LV. The TandemHeart™ (TandemLife, Pittsburgh, PA) could also be used as an effective LV unloading method. However, their costs are very high and unavailable in many countries. Pulmonary artery venting has also been described for LV unloading. However, it provides partial unloading. Decompression of LA using a transseptal cannula incorporated into the ECMO circuit is becoming an increasingly used option.

However, timing of unloading the left heart has not been determined yet. Conventionally, the unloading is considered when patients show inadequate opening of the aortic valve on echocardiography or refractory pulmonary edema on chest radiograph in spite of optimal medical treatment. One study showed earlier timing of LA decompression was associated with better outcomes in pediatric patients. Another study demonstrated elective LV decompression reduced the duration of VA-ECMO. However, these studies are limited because of their retrospective designs. It is not clear which one is better between early invasive and conservative unloading of LA.

In this session, Dr. Kim will present the EVOLVE-ECMO (Early Left Atrial Venting Versus Conventional Treatment For Left VEntricular Decompression During Venoarterial ExtraCorporeal Membrane Oxygenation Support) trial, which is a randomized controlled trial to compare early LA venting (electively performed when VA-ECMO is implanted) with conventional LA venting (performed when pulmonary congestion or aortic valve closure are not improved after optimal medical treatment) in patients with refractory CS who need VA-ECMO support **(Figure 2)**. The aim of EVOLV-ECMO trial is to test the hypothesis that early LA venting would result in a meaningful reduction in VA-ECMO weaning failure in refractory CS.

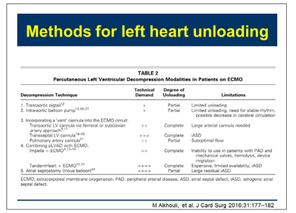


Figure 1. Methods for left heart unloading

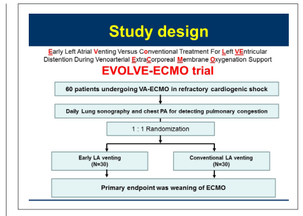


Figure 2. Study design of EVOLVE-ECMO trial

Cross Specialty 2
Interventional Heart Failure Therapy
›› Friday, Oct 12, 10:20-11:50 AM / Grand 1

Continued from page 1

this wide range of interpretation directly reflect currently practicing wide range of ablation strategies for PVI.

We have been evaluating left atrium of atrial fibrillation patients without prior ablation using the high-resolution mapping systems during posterolateral coronary sinus pacing in order to characterize the pulmonary vein and left atrium substrates. There have been interesting electrophysiological findings that provided insights for the PV reconnection. Among the important findings for PVI or ablations are: 1) standardization for PVI sites based on the voltage map to create more consistent transmural lesion; 2) reduction in number of ablation lesions during PVI, therefore less myocardial damage; 3) confirmation of the absence of gaps post PVI; and 4) individualization of linear ablations strategy based on the voltage map to minimize the ablation lesions, to titrate ablation power and to confirm conduction block without gaps.

The high-density mapping has been extremely useful to identify the substrate and the mechanisms of tachycardia recurrence in patients who previously had catheter ablations or maze surgery. The PV reconnection mechanism and the gaps are readily identified including the silent gaps. The gaps over previous linear ablation sites are also identified and activation maps in conjunction with isochronal maps are useful to define critical isthmus of reentry tachycardia. Especially it is useful to differentiate between the macro vs. micro-reentry mimicking the atrial flutter. Therefore, we can eliminate tachycardia or flutter mechanism with discrete and fewer ablation lesions.

The high-density mapping guided ablation requires detailed mapping of entire left atrium and the pulmonary veins and then proper interpretation of the mapping data including unipolar and bipolar voltage maps, propagation map and isochronal map. Therefore, high density mapping guided ablation strategy requires longer procedure time than the empiric ablation strategy. However, the understanding of the mechanism of atrial fibrillation and individual patient data-based ablation strategy targeting the critical areas can improve long-term outcomes and may provide insights to develop new strategies for such prevalent disease.

New Frontiers in Cardiology 2
Evolving and Emerging Issue in Cardiology
›› Friday, Oct 12, 10:20-11:50 AM / Theatre

Transforming Clinical Trials and Registry in CVD

Pragmatic PCI Trial in Korea: What and How?

Duk Woo Park, MD, PhD
Ulsan University Asan Medical Center, Korea

Large randomized clinical trials (RCTs) in cardiovascular disease have proliferated over the past 3 decades, with results that have influenced every aspect of cardiology practice. Despite these advances, there remains a substantial need for more high-quality evidence to inform cardiovascular clinical practice, given the increasing prevalence of cardiovascular disease around the world. The investigations are often framed in ways that fail to address patients' and clinicians' actual questions about a given treatment. Although these trials are conducted in clinical settings, their enrolled populations and management approach don't reflect the complexity and diversity of actual clinical practice. Because of concerns about the real-world applicability and about improving the quality and value of health care, "pragmatic" or "practical" trials are attracting increasing attention. Pragmatic trials are designed and conducted to answer important questions facing patients, clinicians, and policymakers. They compare two or more medical interventions that are directly relevant to clinical care or health care delivery and strive to assess those interventions' effectiveness in real-world practice. They use broad eligibility criteria and recruit patients from a variety of practice settings to ensure the inclusion of the type of patients whose care will actually be influenced by the trial's results. The medical management in pragmatic trials is consistent with usual clinical care — which often means omitting study procedures such as blinding that alter the "ecology" of care. Ideally, these trials measure all the outcomes that are important to patients and decision makers, including survival, functional status, quality of life, and costs. And the duration of treatment and follow-up should be sufficient to adequately assess the treatments' benefits and risks.

Dr. Park will give a talk on the current pragmatic registries and RCTs in Korea including the POST-PCI (Pragmatic Trial Comparing Symptom-Oriented Versus Routine Stress Testing in High-Risk Patients Undergoing Percutaneous Coronary Intervention) trial **(Figure 1)**. The POST-PCI study is a pragmatic RCT to evaluate the prognostic effect of routine post-PCI noninvasive stress testing on major cardiovascular events in high-risk patients who receive PCI with contemporary. The aim of POST-PCI is to test the hypothesis that routine post-PCI screening high-risk patients with diabetes deemed to be at high risk for the presence of recurred culprit or non-culprit coronary artery disease through the use of noninvasive stress testing would result in a significant long-term reduction in death, myocardial infarction, or hospitalization for unstable angina.

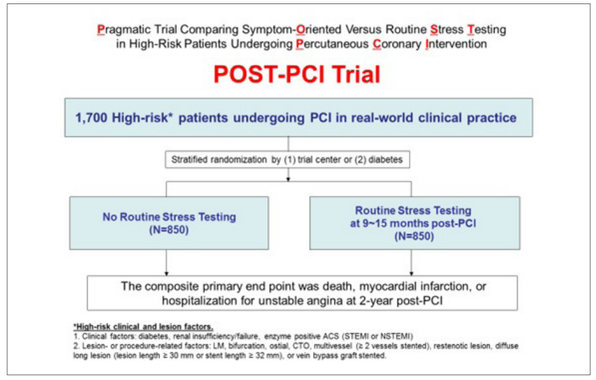


Figure 1. Overview of POST-PCI trial

Transforming Clinical Trials and Registry in CVD
›› Friday, Oct 12, 08:40-10:10 AM / Grand 1

Arrhythmia

Korean VT Guideline

Ju Youn Kim, MD, PhD
Catholic University Uijeongbu St. Mary's Hospital, Korea

Ventricular arrhythmias (VA) are a major cause of sudden cardiac death (SCD) in patients with known heart disease. Risk assessment and effective prevention of SCD are key issues in these patients. Implantable cardioverter defibrillator (ICD) insertion effectively treats sustained VA and reduces mortality in patients at high risk of SCD. Appropriate anti-arrhythmic drugs and catheter ablation reduce the VA burden and the occurrence of ICD shocks.

Dr. Kim will present "Korean ventricular tachycardia (VT) guideline". The recommendations constitute the first clinical practice guidelines of the Korean Heart Rhythm Society regarding catheter ablation of VAs. Catheter ablation can be recommended in patients in whom antiarrhythmic medications are ineffective. This presentation will discuss about the diagnostic criteria, risk stratification, and treatment of these syndromes. Management strategies of VAs occurring in specific populations such as in patients with psychiatric and neurological disorders, pregnant patients, those with obstructive sleep apnea or drug-related proarrhythmias, athletes, and elderly patients will be presented.

Ablation of Difficult VT

Akihiko Nogami, MD, PhD
University of Tsukuba, Japan

Over the past decade, catheter ablation has emerged as an important therapeutic option for VT in both patients with and without structural heart disease. With the growing number of patients with implantable devices as well as improvements in heart failure therapy resulting in improved survival among ICD patients, the overall number of patients needing ablation therapy for VT continues to increase. The past years have witnessed significant advances in our understanding of the arrhythmic substrate in various cardiomyopathies, resulting in substrate-based approaches for targeted VT ablation. Dr. Nogami will discuss about ablation of difficult VT. Ablation strategies of VAs originating from the left ventricular (LV) summit and the communicating vein will be discussed in this presentation.

Arrhythmia 3
VT Summit
›› Friday, Oct 12, 08:40-10:10 AM / Walker 1

Catheter Ablation in Patients with Congenital Heart Disease

Chun Hwang, MD
Utah Valley Regional Medical Center, USA

The congenital heart disease population has grown rapidly due to the increased life expectancy with modern treatments. A wide range of arrhythmia can be observed in these patients and arrhythmia can be the presenting symptom in unsuspected congenital cardiac anomaly, such as persistent left superior vena cava or develop long after the corrective surgery. Also, the initial symptomatic manifestation of arrhythmia can vary and often directly related cardiac dysfunction resulted from the structural anomaly. The safe and effective management of arrhythmias in congenital heart disease requires a thorough appreciation for conduction system variants, arrhythmia mechanisms, underlying anatomy, and associated physiology. Dr. Hwang will discuss about ablation of arrhythmia in patients with congenital heart disease. According to Dr. Hwang, a catheter ablation in these patients is not only feasible but also safe. Therefore, electrophysiologists should not fear of performing catheter ablation in patients with congenital heart disease.

Efficient and Smart Methods for Diagnosis of SVT

Byung Chun Jung, MD, PhD
Daegu Fatima Hospital, Korea

Electrophysiologic studies (EPS) have dramatically influenced the diagnosis and treatment of supraventricular tachycardia (SVT). Intracardiac recordings have helped to map accessory pathways and reentry circuits in patients, and they have also assisted electrophysiologists in understanding the mechanisms behind these tachyarrhythmias. In a prospective registry, Lauschke et al. compared the prevalence of inducible arrhythmias and the clinical outcome in 525 patients with and without electrocardiogram (ECG) documentation. Results showed that a substantial proportion of patients with suspected paroxysmal tachycardia, but without ECG documentation, had inducible SVTs and clinically benefited from an EPS. At present, EPS is generally performed in combination with radiofrequency catheter ablation. Dr. Jung will present efficient and smart methods for diagnosis of SVT.

Arrhythmia 4
Guideline Session & PSVT
›› Friday, Oct 12, 14:00-15:30 PM / Walker 1

Echocardiography

Diagnostic and Treatment Issues of Cardiac Sarcoidosis

Lori A. Blauwet, MD
Mayo Clinic, USA

Cardiac sarcoidosis is considered to be a relatively rare disease, but is likely not as rare as it has been reported. The presence of non-necrotizing non-caseating granulomas on endomyocardial biopsy confirms the diagnosis, but the current diagnostic yield of endomyocardial biopsy (EMB) is at most 50%, even with advanced imaging and electrophysiological (EP) guidance.

The Heart Rhythm Society (HRS) criteria for the diagnosis of cardiac sarcoidosis, published in 2014, include two pathways: 1) histologic diagnosis from myocardial tissue and 2) clinical diagnosis from invasive and non-invasive studies (provided there is histological diagnosis of extra-cardiac sarcoidosis). The Japanese Circulation Society (JCS) first published guidelines for the diagnosis of cardiac sarcoidosis in 2006. These guidelines list major and minor criteria to be used to confirm the diagnosis via either a histologic or clinical pathway. The JCS published an update to these guidelines in 2017 which elevate the importance of cardiac MRI and 18F-FDG PET imaging and, most importantly, for the first time list criteria for the diagnosis of isolated cardiac sarcoidosis.

Incorporating the HRS and JCS criteria into clinical practice remains challenging, as the presentation and progression of cardiac sarcoidosis is quite variable. It often takes a high degree of suspicion to pursue the appropriate work-up necessary to make the diagnosis in a timely fashion. It is critically important to diagnose cardiac sarcoidosis in the early stages of the disease, as early diagnosis and treatment may potentially prevent serious complications. Collaboration between clinicians, pathologists, and imaging specialists is essential for clinching the diagnosis of cardiac sarcoidosis which, in turn, will likely improve outcomes.

There currently are no therapies for cardiac sarcoidosis which have been proven to be effective. Although corticosteroids are the mainstay treatment for patients with cardiac sarcoidosis, there is a paucity of data to support the effectiveness of this therapy. Optimal doses and duration of corticosteroid therapy have not been systematically studied. In addition, there are no clear guidelines regarding when to

Continued on page 9

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initiate corticosteroid therapy, although one small study has suggested that the best outcomes are achieved with early initiation of immunosuppression. Steroid-sparing agents are often used for refractory cases or when patients experience adverse effects from steroid therapy. A number of medications have been used as second-line agents with varying degrees of success in individual patients. Some centers, including the Mayo Clinic, have routinely introduced a steroid-sparing agent when corticosteroid therapy is initiated rather than waiting to determine responsiveness to steroid therapy before adding a second agent, allowing a more rapid steroid taper so as to minimize the potential for steroid-induced weight gain, diabetes, and osteoporosis.

As many patients with cardiac sarcoidosis present with high grade atrioventricular (AV) block, pacemaker implantation is frequently indicated per standard device guidelines. Decisions regarding Implantable cardioverter-defibrillator (ICD) implantation in patients with cardiac sarcoidosis are not always clear-cut, although there is consensus that ICD implantation is indicated in patients who have history of spontaneous sustained ventricular arrhythmias or who have left ventricular ejection fraction (LVEF) ≤35% despite optimal medical therapy and a period of immunosuppression if inflammation is present.

Left ventricular assist device (LVAD) implantation is occasionally indicated in patients with cardiac sarcoidosis due to advanced heart failure symptoms refractory to medical management. Several studies have reported that a small number of patients are diagnosed with isolated cardiac sarcoidosis based on analysis of left ventricular (LV) core samples obtained at the time of LVAD implantation for previously unexplained cardiomyopathy.

Orthotopic heart transplant is occasionally indicated for patients with cardiac sarcoidosis who experience intractable arrhythmias or end-stage heart failure. The outcomes, including intermediate and long-term survival, for these patients with cardiac sarcoidosis are better than for patients undergoing heart transplant for all other diagnoses.

Echo 3
New Insights Provided by USA Experts
›› Friday, Oct 12, 08:40-10:10 AM / Walker 2

Biomedical Engineering Society for Circulation

Computational Hemorheology and its Visualization Using Lattice Boltzmann Method

Joon Sang Lee, PhD
Yonsei University, Korea

In today's talk, Dr. Lee will present his study to examine rheology of a suspension of red blood cells (RBCs) in microfluidic channels with hydrophobic and hydrophilic surfaces and predict the flow in these channels. Rheological behaviors are observed with respect to several variations in parameters such as channel diameter, volume fraction of RBCs, and surface properties. A model that combines the three-dimensional lattice Boltzmann method and the immersed boundary method is used to simulate these suspension systems. The surface properties of the channel are changed using the tangential momentum accommodation coefficient on the channel boundary to set up hydrophobic surface in the simulation. The relative apparent viscosity is used to calculate systematic flow resistance. The results of this study indicate that the flow rate and flow profile varied with respect to the surface property under a constant pressure gradient. Transient analysis is used to investigate the relative apparent viscosity of the RBC suspension, concentration of the RBCs, and thickness of the cell-free layer of the suspension as a function of the surface property. This study revealed that the relative apparent viscosity decreases in the hydrophobic channel **(Figure 1)**. In addition, it was observed that a thinner cell-free layer was formed in the hydrophobic channel than the hydrophilic channel. These have implications for research in fundamental biological, biomedical, and homological applications.

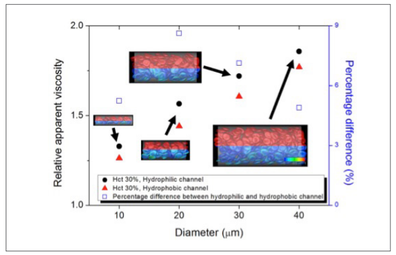


Figure 1. Relative apparent viscosity of hematocrit (Hct) = 30% RBC flow in the hydrophobic and hydrophilic surface channels at 1.5x10^{4} Pa/m

BESCO 1
Biomedical Engineering Society for Circulation 1
›› Friday, Oct 12, 14:00-15:30 PM / Grand 3

Ultrasonic Measurement of Hemorheology in the Carotid and Coronary Arteries

Dong-Guk, Paeng, PhD
JeJu National University, Korea

Blood flow is complicated due to the biconcave shape and characteristics of red blood cells (RBCs) flowing in plasma in the vessel. Red blood cell aggregation is one of the most important factors for non-Newtonian blood flow. High viscosity at low shear rate is a well-known hemorheological phenomenon, mainly due to RBC aggregation at low shear rate. However, this inverse relation of viscosity and shear rate is all measured from steady flow, which is different from the physiological arterial flow.

Dr. Paeng will give a lecture on the role of ultrasound measurement of RBCs and their aggregation in terms of screening and diagnosis of disease related with RBC aggregation. Ultrasound is one of the most appropriate techniques to observe blood flow in large arteries due to its non-invasive and real-time characteristics. In addition to obtain blood flow profile and patterns using Doppler principle, RBCs and their aggregates can be also measured since they are Rayleigh scatters up to a certain MHz frequency range. The relationship between viscosity and shear rate can easily be verified by the exponential decrease of the ultrasonic backscattering coefficient with shear rate under steady flow.

However, this inverse relation between viscosity and shear rate was not enough to explain the experimental results measured from in vitro pulsatile flow with porcine blood and in vivo physiological flow on human and rat arteries. Therefore, flow acceleration was hypothesized to enhance red blood cell aggregation due to compressional force during systole, and the combined effects of shear rate and flow acceleration were suggested as explanation of the cyclic and spatial variation of echogenicity and red blood cell aggregation. During measurements of the echogenicity variation during a pulsatile cycle, the 'bright collapsing ring (BRCR)' phenomenon was observed, where the bright echogenicity ring near the periphery of the artery or tube was shrinking down to its center during systole in the cross-sectional view. This BRCR phenomenon was observed as a parabolic profile in B-mode and M-mode images.

This BRCR and parabolic profile has recently been investigated through numerical simulation of RBC particle model by traveling sinusoidal flow in a 2-dimensional tube based on depletion model. The RBC aggregation and its parabolic profile were in agreement with the experimental results. The Newton's 2nd law by the interactional forces (elastic and aggregation forces which are dependent on the distance between two RBCs) and pseudo-steady Stokes drag force of the traveling sinusoidal pulsatile flow drive RBCs and their aggregation as the parabolic profile of rouleaux and its breaking **(Figure 2)**. The numerical simulation also computed the optimal flow acceleration to enhance RBC aggregation.

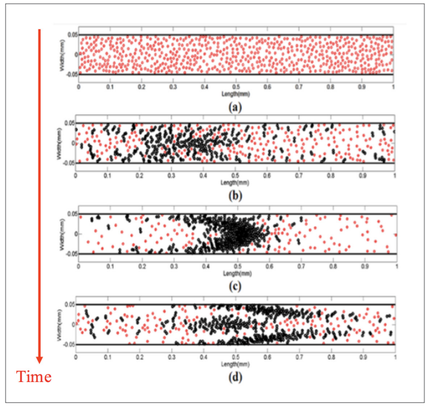


Figure 2. Four processes of RBC aggregation under sinusoidal pulsatile flow at 0, 0.1, 0.5, and 1 s representing random RBC distribution at initial time, small rouleaux formation, parabolic shape, and broken parabolic shape, respectively

BESCO 2
Biomedical Engineering Society for Circulation 2
›› Friday, Oct 12, 15:40-17:10 PM / Grand 3

14:00-17:00, Walker 2

Nurse & Technician Session

Special Lecture

Nurse & Technician Session 1

14:00-14:20	Congenital Disease Treatment in Children and Adults
14:20-14:40	Application and Method of Right-sided Heart Catheterization by Disease

Congenital & Valvular Disease Intervention

Nurse & Technician Session 2

14:50-15:05	New Device Introduction and Case Review Related to ASD
15:05-15:20	Planning and Performing PDA Step by Step
15:20-15:35	Planning and Performing PMV Step by Step
15:35-15:50	Understanding of Percutaneuse Paravalvular Leakage Closure

Interesting TAVI Case

Nurse & Technician Session 3

16:00-16:15	Interesting TAVI Case - Severely LVOT Calcification
16:15-16:30	Interesting TAVI Case - Valve in Valve
16:30-16:45	Interesting TAVI Case - Other Access Route
16:45-17:00	Interesting TAVI Case - Minimally Invasive TAVI

Late Breaking & Featured Research from Korea

Identification on Preventive Mechanism of Sodium-Glucose Cotransporter 2 (SGLT-2) Inhibitor for Atherosclerosis in Normoglycemic Rabbit Model

Jung-Sun Kim, MD, PhD
Yonsei University Severance Hospital, Korea

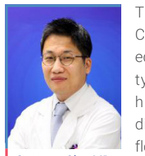
The purpose of this study was sought to investigate an anti-atherosclerotic and anti-inflammatory effect of sodium-glucose cotransporter 2 (SGLT-2) inhibitors in normoglycemic atherosclerotic rabbit model. However, the anti-atherosclerotic effect in normoglycemic status has not been clearly elucidated.

A total 26 male New Zealand white rabbits were fed a 1% high-cholesterol diet for 7 weeks followed by changed normal diet of 2 weeks. Endothelial denudation was performed using a balloon catheter on aorta arteries. The experimental group (n=13) was treated with dapagliflozin 1 mg/kg/day for 8 weeks after developing atherosclerotic model and compared to control group (n=13). All lesions were assessed with angiography and optical coherence tomography (OCT) and aorta was harvested for histological assessment.

SGLT-2 inhibitor treatment group decreased in the atheromatous plaque (38.5±3.2% vs. 21.9±1.2%, p<0.05) and lipid accumulation (16.9±3.6% vs. 10.9±2.3%, p=0.18) compared to control group. The SGLT-2 inhibitor group showed lower macrophage infiltration (20.2±1.9% vs. 12.7±1.9%, p<0.05) as well as inflammatory expression (31.2±4.4% vs. 19.5±2.1%, p<0.05). The growth of the plaque was suppressed, which was a therapeutic effect of SGLT-2 inhibitor group (32.1±1.2% vs. 22.8±0.9%, p<0.05) using OCT analysis of percent area stenosis.

These results suggest that SGLT-2 inhibitor may be associated with the preventive effect for the development of atherosclerosis through the reduction of inflammation in normoglycemic rabbit model.

Cardioprotective Potential of a SGLT-2 Inhibitor Against Doxorubicin-Induced Heart Failure



Sungsoo Cho, MD
Dankook University, Korea

The EMPA-REG OUTCOME trial demonstrated that in patients with type 2 diabetes with high cardiovascular disease risk, empagliflozin (EMPA, an SGLT-2 inhibitor) reduced cardiovascular mortality by 38% and hospitalization for heart failure (HF) by 35%. Despite these surprising results, the exact mechanisms of these cardiovascular benefits remain to be determined. We focused on the whole-body metabolic shift in fuel energetics induced by sodium-glucose cotransporter 2 (SGLT-2) inhibition because SGLT-2 inhibition promotes ketone body, such as beta-hydroxybutyrate (βOHB) utilization as an energy source in the heart and this shift might provide an energy advantage to the failing heart. Therefore, we wanted to examine whether the SGLT-2 inhibitor reduces oxidative stress and improves cardiac function by βOHB by increasing blood concentration in the doxorubicin (Dox)-induced HF model. Mice that were fed NCD with empagliflozin showed improved heart function and reduced fibrosis. These effects were indirect because there is no SGLT-2 in mouse cardiomyocytes. In vitro studies showed similar results. βOHB showed a protective effect against doxorubicin in H9C2 cells and in doxorubicin-treated mice. In summary, our study showed that a SGLT-2 inhibitor could reduce Dox-mediated LV dysfunction. This protective effect is mediated by elevated βOHB levels. Our findings suggested that cardioprotective role of SGLT-2 inhibitor indicates a new strategy to prevent heart failure in patients receiving Dox.

Late Breaking & Featured Research from Korea
›› Thursday, Oct 11, 15:40-17:10 PM / Theatre

Pediatric Cardiology

Perioperative Management in Neonates with Duct-dependent Pulmonary Circulation

Hye Won Kwon, MD
Seoul National University Children's Hospital, Korea

Congenital heart defects with ductus-dependent pulmonary circulation are defined as abnormalities, in which the patency of the ductus arteriosus is mandatory in order to maintain pulmonary circulation because of severe restriction of pulmonary blood flow (e.g. pulmonary atresia) and postnatal constriction of the ductus causes severe hypoxemia, cyanosis, and death.

If a ductus-dependent pulmonary circulation is diagnosed by echocardiography in a newborn with cyanosis, prostaglandin E1 (PGE1) should be administered promptly to maintain the ductus arteriosus. Oxygen may constrict the ductus and should be given only to newborns with severe cyanosis. Once PGE1 is administered, the stabilized infant will undergo palliative or definite surgery in the neonatal period.

The palliative surgery to relieve cyanosis is a systemic-pulmonary artery shunt, modified Blalock-Taussig shunt or central shunt. Perioperative physiologic monitoring should include an arterial line in the left upper extremity (avoiding the ipsilateral systemic pulmonary artery shunt side), central venous line, and near-infrared spectroscopy. Maintaining systolic blood pressure at 70 mg or higher is desirable early in the postoperative course to promote pulmonary blood flow and coronary perfusion. Careful attention must be paid to balance pulmonary and systemic blood flow (Qp/Qs) and appropriate preload. Nitric oxide (NO) may be beneficial to assist in pulmonary vasodilation until the neonatal pulmonary vascular bed adapts to the altered flow dynamics.

Definite surgery can be performed with pulmonary valvotomy or right ventricular to pulmonary artery connection, either via conduit or via transannular patch augmentation of the right ventricular outflow tract. For those patients undergoing RV decompression, proper postoperative preload should be maintained, and dobutamine and milrinone may be administered to support RV function, and NO may be required to reduce RV afterload.

Neonates with ductus-dependent pulmonary circulation have a high perioperative mortality rate, but intensive and delicate management can increase the survival of the patients.

Pediatric Cardiology 1
Management Strategy for the Neonate Associated CHD
›› Friday, Oct 12, 14:00-15:30 PM / Grand 2

2019 Annual Spring Scientific Conference of the KSC
in conjunction with KHRS, KSIC, KSE, KSoLA, BEC and KHFS

2019년 춘계심혈관통합학술대회

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일시: 4.19(Fri) ~ 20(Sat)

장소: 부산벡스코 (BEXCO)

KSC 2019

대한심장학회 제63차 추계학술대회

The 63rd Annual Scientific Meeting of The Korean Society of Cardiology

Oct. 18 Fri. - 20 Sun.

Grand Walkerhill

Seoul, Korea