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. 13. Saturday

Today's Highlights

Cross Specialty 3: Echo & Surgery
08:40-10:10 AM Rm. Theatre

VNHA-KSC Joint: Intervention
Complex PCI in Asia
08:40-10:10 AM Rm. Grand 1

Healthcare Policy
08:40 AM-17:10 PM Rm. Grand 4

Education Workshop
08:40 AM-17:10 PM Rm. Walker 2

New Frontiers in Cardiology 3
Listening from the Expert and Pioneer in Cardiology
10:20-11:50 AM Rm. Theatre

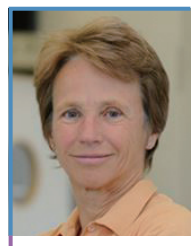
JCS-KSC Joint Symposium: AMI
2018 Update of Expert Consensus Statement on Antiplatelet Therapy in East Asian Patients with ACS or Undergoing PCI
14:00-15:30 PM Rm. Theatre

Meet the Editor-in-Chief
Publish or Perish - Insights from the Editors
14:00-15:30 PM Rm. Cosmos

Ethics Workshop
End-of-Life Care in Medicine
15:40-17:10 PM Rm. Theatre

New Frontiers in Cardiology 3

Sudden Cardiac Arrest (SCA) in Women and in Men



Vera Regitz-Zagrosek, MD
University Medicine Berlin, Germany

Sudden cardiac arrest (SCA) is more than twice as frequent in men than in women and has different disease associations in both sexes. In men, 80% is caused by coronary heart disease, whereas in women, this is less than half. In women, who survive an SCA, more often cardiomyopathies, structurally apparently healthy hearts as well as genetic causes, such as long QT syndromes (LQTS) are found. In LQTS, severe arrhythmic events and sudden cardiac death are equally common during childhood and adolescence among boys and girls; after puberty, however, the rate increases significantly in young women, but not in men. Shortening of QT interval by testosterone and its lengthening by estrogen have been reported to contribute to these phenomena. Furthermore, the influence of the localization of the mutation in the disease related gene, in a channel-forming loop or in another localization, has a much greater influence in men than in women.

Sudden cardiac death in sports is above all men's disease. 95% of SCA victims in sports, affected in large studies are men. Targeted examinations have shown that women are also protected against sudden cardiac death when they are subjected to a great deal of stress. Sex specific switches in adrenergic signaling under stress conditions could represent an endogenous protective mechanism in women. Furthermore, women may generate protective metabolites in the arachidonic acid pathways under the influence of estrogen, whereas men, under the influence of testosterone, generate more pro-arrhythmic and pro-hypertrophic metabolites.

In conclusions, Dr. Vera Regitz-Zagrosek suggests that although the mechanisms underlying protection in women are still unknown, women and men are not equally treated with defibrillators. Women receive less for the same indications, in primary as well as in secondary prevention and the reasons for this are not yet clear.

Interventional Stroke Reduction - the EP Perspective

Kyoung-Ryul Julian Chun, MD
Medizinische Klinik III, Markuskrankenhaus, Germany

Stroke represents the most devastating complication of atrial fibrillation (AF), and the latter increases the risk of stroke by almost fivefold. Therefore, prevention of thromboembolic complications is one of the major therapeutic goals in AF treatment. The recent update of the AF guidelines recommends initiation and lifelong maintenance of oral anticoagulation (OAC) with a vitamin K antagonist or preferably a novel oral anticoagulant (NOAC) in AF patients who are older than 65 years of age and/or have one additional risk factor for thromboembolic complications included in the CHA_2DS_2-VASc score. Interventional strategies to reduce stroke in AF include loop recorder implantation to increase AF recognition, catheter ablation aiming for AF suppression and left atrial appendage (LAA) closure to avoid thrombus formation and embolization may contribute to prevent stroke in AF patient. In this presentation, update of clinical data of these interventional strategies will be discussed.

New Techniques of AF Ablation

Catheter ablation has been established in the treatment of atrial fibrillation (AF). The cornerstone of an AF ablation procedure represents pulmonary vein isolation (PVI). The traditional "gold standard" utilizes radiofrequency (RF) current in conjunction with a 3-dimensional mapping system to create "point-by-point" lesions encircling the PVs. This RF ablation strategy is technically challenging and requires a long individual learning curve. Recent technological improvements included the ability to obtain catheter contact force (CF) readings from the tip of the RF catheter potentially allowing for optimized RF lesion formation. This CF information was further refined and resulted in the introduction of an ablation index (AI) aiming for transmural lesions. In contrast, anatomic PVI ablation technologies utilizing different balloons and energy sources (cryo, laser) may contribute to more reproducible ablation results. The recent prospective randomized Fire and Ice trial proved non-inferiority of the cryoballoon compared to the "gold standard" RF ablation. Therefore, further RF and balloon ablation strategies have been developed and under way to enter the clinical stage. In this presentation, insights into latest technological improvements will be provided.

Plaque Protrusion - the Risk Factor of Ischemic Complication During Carotid Artery Stenting: How to Predict and to Prevent Plaque Protrusion using MR Plaque Imaging

Plaque protrusion (PP) inside stents on angiography or intravascular ultrasound during carotid artery stenting (CAS) is closely associated with ischemic complications and a significant increase

Continued on page 4

Program at a glance: Day 3, Oct 13, 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	**Cross Specialty 3: Echo & Surgery**	****VNHA-KSC Joint (Intervention)** Complex PCI in Asia	**ACHD 1** ACHD with Problem	**Oral Abstracts Echo 2** 187-192	**Healthcare Policy 1** 미세먼지 심혈관의 새로운 적	**Oral Abstracts Arrhythmia 6** 193-198	**Arrhythmia 5** AF Summit	**Education Workshop 1: Arrthythmia** Atrial Fibrillation	**Hypertension 1** Understanding the 2018 Korean Society of Hypertension Guidelines	**Oral Abstracts CAD 9** 199-204	**Oral Abstracts Heart Failure 4** 205-210 (Case & Abstract Zone 1)	**E-Poster** 1-197
10:20 - 11:50	**New Froniters in Cardiology 3** Listening from the Expert and Pioneer in Cardiology	**Intervention 3** TAVR vs. SAVR	**ACHD 2** ACHD with Solution	**Echo 5** Symptom- or Sign-based Approaches	**Healthcare Policy 2** 운동과 심장	**Oral Abstracts Intervention 6** 211-216	**Arrhythmia 6** CIED Summit	**Education Workshop 2: Heart Failure** Monitoring of Congestion in Heart Failure	**Hypertension 2** Blood Pressure Measurement Post Mercury Sphgymo-manometer Erea	**Oral Abstracts CAD 10** 217-222	**Oral Abstracts Epidemiology & Prevention** 223-228 (Case & Abstract Zone 1)	
12:00 - 12:40		**Scientific Session [Hanmi]**			**Healthcare Policy** (12:00-12:50) Special Lecture		**Scientific Session [Amgen]**	**Scientific Session [Dong-A ST/ Takeda]**				
12:40 - 14:00											Mini Oral Zone 1 66-73 / Case Zone 1 57-63 / Mini Oral Zone 2 74-82 / Case Zone 2 64-70	Mini Oral Zone 3 83-92 / Case Zone 3 71-77 / Mini Oral Zone 4 93-102 / Case Zone 4 78-84
14:00 - 15:30	***JCS-KSC Joint (AMI)** 2018 Update of Expert Consensus Statement on Antiplatelet Therapy in East Asian Patients with ACS or Undergoing PCI	**Intervention 4** Coronary Imaging and Physiology Update 2018	**Pediatric Cardiology 3** Dealing with Borderline Ventricles	**Echo 6** Let's Focus on the Right-sided Heart	**Healthcare Policy 3** Smoking, Stress, Sleep	**Oral Abstracts Intervention 7** 229-234	**Oral Abstracts Arrhythmia 7** 235-240	**Education Workshop 3: Echo** Echocardiography and Its Friends in Cardiomyopathies / Pericardial Diseases	**Meet the Editor-in-Chief** Publish or Perish - Insights from the Editors	**Oral Abstracts CAD 11** 241-246	**전공의 Awards 구연** 1-7 (Case & Abstract Zone 1)	**E-Poster** 1-197
15:40 - 17:10	**Ethics Workshop** End-of-Life Care in Medicine (필수교육)	**Intervention 5** Intervention Transit: Tips and Tricks for CHIP	**Pediatric Cardiology 4** Other Cardiac Issues	**Echo 7** Interesting Cases from Diverse Institutions 2	**Healthcare Policy 4** Cardio-metabolic-renal Syndrome	**Oral Abstracts Arrhythmia 8** 247-252	**Arrhythmia 7** Sudden Cardiac Death Summit	**Education Workshop 4:** Interventional Therapy for Structural Heart Disease		**Oral Abstracts CAD 12** 253-258	**전공의 Awards Case** 1-9 (Case & Abstract Zone 1)	

*JCS: Japanese Circulation Society
**VNHA: Vietnam National Heart Association

Scientific Session

Scientific Session 8 [Hanmi]

The Benefit of Intensive BP Control Focus on Amlodipine/Losartan FDC

›› Oct 13, 12:00-12:40 PM Rm. Grand 1

Scientific Session 9 [Amgen]

The Evolving Future of PCSK9 Inhibitors

›› Oct 13, 12:00-12:40 PM Rm. Walker 1

Scientific Session 10 [Dong-A ST/Takeda]

Hypertension Paradox and New ARB Azilsartan

›› Oct 13, 12:00-12:40 PM Rm. Walker 2

Cross Specialty Session 3: Echocardiography & Surgery

Decision of Surgical Timing in Degenerative MR; from LV Ejection Fraction to LV strain

Seonghoon Choi, MD
Hallym University Kangnam Sacred Heart Hospital, Korea

Severe primary mitral regurgitation (MR) is a progressive condition engendering significant mortality and morbidity if left untreated. Surgical indications in patients with severe primary MR include development of symptoms, asymptomatic left ventricular (LV) systolic dysfunction (left ventricular ejection fraction [LVEF] <60%), new-onset atrial fibrillation (AF) or pulmonary arterial hypertension. In chronic MR, although LV dilatation should result in an increase in afterload, this is reduced by ejection of much of its volume into the low-impedance left atrium (LA). Over time, the hemodynamic burden of volume overload eventuates in LV dysfunction, impaired ejection and increased filling pressure. Eventually, symptoms of pulmonary congestion, reduced cardiac output and pulmonary hypertension supervene develop, sometimes abruptly with the onset of atrial fibrillation. LV dysfunction can occur in the absence of symptoms. LV dysfunction is masked by enhanced ejection force due to the combination of increased preload and reduced afterload, and LV contractility may already be irreversibly impaired in asymptomatic state, even though LVEF remains in the normal range.

There are so many proposed parameters to predict subclinical LV dysfunction in asymptomatic or compensatory period, such as forward LVEF and global longitudinal strain (GLS). Current evidence show that GLS is elevated in chronic degenerative MR and normal range of GLS mean LV systolic dysfunction. LV systolic dysfunction has already been set in asymptomatic MR if their GLS is in normal range (-20%). Pre-operative reduction of strain can be predictive of depressed LVEF postoperatively and postoperative GLS < -19.9 or -18.1% to be independently predictive long-term EF reduction and increased cardiac events including mortality.

The patients with asymptomatic severe degenerative MR, who is not indicated surgical correction, should be monitored with regular work-up by echocardiography not only LVEF, LA or LV chamber dimension but also subclinical LV dysfunctional parameters like as GLS for timely optimal surgical correction.

When Intraoperative Echocardiography Can Change Surgical Decision

Transesophageal echocardiography (TEE) has been introduced into clinical practice in the 1980s, and it is widely used during perioperative period. Now, intraoperative TEE is an essential diagnostic and monitoring tool for cardiac surgery. It can provide many valuable information that cannot be obtained by any other modality in the operative suite. Intraoperative TEE can recognize undetected or changing pathophysiology in real-time. Moreover, it can provide information in a way that is requested by the surgeon during surgery. During CPB (cardiopulmonary bypass), TEE can be used to guide and monitor the CPB cannula location and function. This is especially important during minimal invasive surgery which limits visibility of the surgical field. After CPB, TEE is used to evaluate the surgical outcome. For example, after valve repair or replacement, TEE could detect and quantify complications, such as paravalvular leaks, outflow tract obstruction, and acute prosthetic valve obstruction.

Yunseok Jeon, MD, PhD
Seoul National University Hospital, Korea

Although intraoperative TEE plays an essential role during cardiac surgery, it requires a skilled interpreter to be correctly used. This is especially true in special settings like operation requiring general anesthesia, positive pressure ventilation, hypovolemia by bleeding, and use of inotropics agents. Due to time gap between last preoperative echocardiography and surgery, there could be functional and anatomical changes. These factors should be considered not only before CPB, but also after CPB-TEE exam. Thus, the surgical decision based on the appropriate use of intraoperative TEE is frequently challenging.

In conclusion, TEE provides valuable information for cardiac surgeons and influences surgical decisions during various cardiac surgeries. However, intraoperative TEE exam may be variably influenced by many perioperative factors. Moreover, interpretation of intraoperative TEE could be extremely challenging. Therefore, for safe and successful cardiac surgery, the collaboration between the surgeons, cardiologists and cardiac anesthesiologists is essential.

Surgical Treatment of Constrictive Pericarditis; Practical Tips

Wook Sung Kim, MD, PhD
Sungkyunkwan University Samsung Medical Center, Korea

Constrictive pericarditis is a condition in which the pericardium is fibrotic and stiff. Diastolic filling of the heart is limited, resulting in right sided heart failure. There are several etiologies of the disease. Tuberculosis was a leading etiology for the last 20 years, but idiopathic or iatrogenic causes are now the leading ones. Prognosis of pericarditis long after mediastinal irradiation is grave.

General preoperative planning for pericardiectomy is similar to other major cardiac procedures, with a special attention to associated tricuspid valve regurgitation and adequacy of hepatic function. Echocardiography is the first-line diagnostic imaging modality of choice to diagnose constrictive pericarditis, and it can also provide hemodynamic information, which is especially important for evaluation of constrictive pericarditis. Cardiac catheterization has been considered a gold standard for diagnosis of constrictive pericarditis, but now echocardiography has replaced its position. Before surgery, coronary angiogram is mandatory in case that a patient is over 40 or 45 years old. It can also provide valuable information and might show fixation of the distal coronary arteries. Computed tomography (CT) can be used as a 'helper' to support the diagnosis of constrictive pericarditis by evaluation of pericardial thickness. However, we need to keep in mind that pericardial thickness can be within normal range in 12-18% of the patients with constrictive pericarditis.

Some surgeons prefer minimal paralysis during anesthesia with use of short-acting muscle blockade agents to facilitate identification of phrenic nerves and low energy electrocautery settings. Adjunct nerve stimulation may be useful to avoid or identify nerve injury early on. The most common approach is a median sternotomy, followed by anterior thoracotomy. The main advantage of the anterior thoracotomy is that it is easy to find the phrenic nerve and remove the pericardium behind the left phrenic nerve without hemodynamic instability.

Cardiopulmonary bypass can also be used. The main disadvantage of cardiopulmonary bypass is a systemic inflammation, which can induce major organ dysfunction and abnormal vascular tone. The extended pericardiectomy is to get rid of the pericardium behind the left phrenic nerve and on the diaphragmatic surface, in addition to the anterior pericardiectomy. The extended pericardiectomy can be done without hemodynamic instability with cardiopulmonary bypass. Recently the extended pericardiectomy with cardiopulmonary bypass showed good long-term outcomes.

Cross Specialty 3
Echo & Surgery
›› Saturday, Oct 13, 08:40-10:10 AM / Theatre

Healthcare Policy Symposium

미세먼지의 건강영향에 대한 근거

권호장
단국대학교 의과대학 예방의학교실

철강공장들이 몰려있던 미국 도노라 지역에서 1948년 10월 말 발생한 스모그로 수십 명이 목숨을 잃고 수천 명이 질병에 걸렸다. 1952년 12월 영국 런던에서 발생한 스모그로 수천 명이 목숨을 잃었고 그 후유증으로 사망한 사람까지 합치면 만 명이 넘었다. 도노라와 런던의 스모그가 막대한 건강피해를 일으켰다는 사실은 자명해서 많은 연구가 필요하지 않았고, 이후 미국과 영국, 그리고 전세계 국가들이 대기오염방지법을 제정한 계기가 되었다.

재난적 상황을 초래하는 극심한 스모그가 아니라 일상적 수준의 공기오염도 건강에 영향을 미친다는 것을 입증하기는 쉽지가 않았다. 1970년 미국의 계량경제학자인 레이브와 세스킨은 다중회귀모형을 이용하여 미국 전역의 카운티에서 대기오염과 사망의 관련성을 분석하였다. 이후 통계모형을 이용한 분석이 대기오염의 건강영향에 대한 근거를 만드는 일차적인 수단이 되었고, 일상적인 대기오염도 건강에 영향을 미친다는 인식을 갖게 되었다.

미세먼지, 특히 지름 2.5 마이크론 이하인 초미세먼지가 건강에 해롭다는 결정적 근거는 하버드대학 연구팀이 6개 도시를 대상으로 시행한 코호트 연구에서 나왔다. 이 연구를 통해 그 당시까지는 안전한 수준으로 여겨지던 대기오염 농도에서도 사망위험이 증가한다는 사실과 대기오염물질 중에는 초미세먼지가 건강과의 연관성이 가장 높다는 사실이 확인되었다. 이후에 대기환경기준에 초미세먼지가 추가되고, 가장 우선적으로 관리하는 대기오염물질이 되었다.

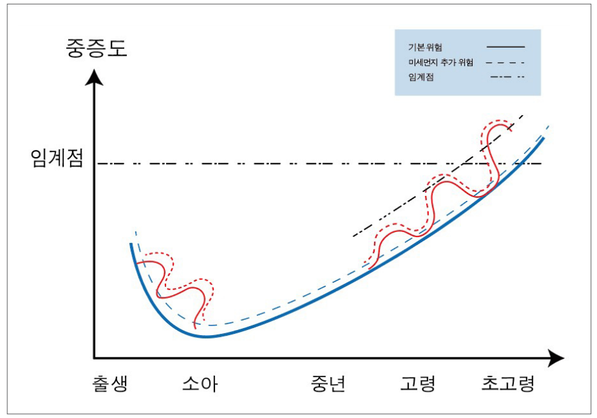


그림 1. 미세먼지가 급·만성 건강피해를 일으키는 기전에 대한 개념적 모형

하버드대학의 6대 도시 연구가 발표된 후에 미세먼지의 건강영향을 밝히기 위한 역학 연구가 전세계적으로 활발히 진행되었고, 비교적 일관된 결과들이 나오면서 미세먼지의 건강영향은 확고한 근거를 갖게 되었다. 미세먼지의 건강영향은 단기 농도 상승에 따른 급성영향과 미세먼지 농도가 높은 지역에 거주하면서 장기간 노출되어 발생하는 만성영향으로 구분되고, 건강에 영향을 미치는 방식은 기존의 위험도에 미세먼지의 위험이 추가되는 방식으로 이해되고 있다**(그림 1)**.

미세먼지의 건강영향을 더 정확하게 평가하려는 시도는 주로 두 가지 측면에서 이루어지고 있다. 첫째는 미세먼지의 노출 평가의 정확성을 높이는 것이다. 대기오염 측정망에서 초미세먼지를 측정하기 시작한 것은 비교적 최근이고 측정지역이 제한적이기 때문에, 인공위성자료와 미세먼지배출량 모델링 결과를 종합한 노출평가가 시도되고 있다. 둘째는 미세먼지 농도 증가에 따른 건강영향의 변화를 정확하게 평가하는 것이다. 예전에는 미세먼지의 장기영향을 볼 수 있는 코호트 연구가 미세먼지 농도가 낮은 북미와 유럽지역에 한정되어 있었는데, 최근 중국 등 아시아지역 연구 결과가 발표되면서 낮은 농도에서 높은 농도에 이르는 전체 범위를 아우르는 양-반응 함수가 산출되고 있다. 미세먼지의 건강영향을 평가하는 방법이 정확해지고 표준화되면서 미세먼지로 인한 피해자 수에 대한 안정적인 통계가 산출될 것으로 기대된다.

Healthcare Policy 1
미세먼지; 심혈관의 새로운 적
›› Saturday, Oct 13, 08:40-10:10 AM / Grand 4

Continued from page 1

Katsutoshi Takayama, MD, PhD
Ishinkai Yao General Hospital, Japan

in PP susceptibility with open cell stent (OS) use and unstable plaque. It was reported PP incidence was 2.6% and ischemic stroke rate among PP patients was 66.7%. In this presentation, how to predict and to prevent plaque protrusion using MR plaque imaging from analysis of 308 consecutive carotid atherosclerotic stenoses in 289 patients (men, 285; women, 43; symptomatic, n=126; mean age, 73.8 [range, 51-91] years; mean stenosis rate, 81.0%; range, 50-99%) who underwent CAS and preoperative MR plaque imaging between will be presented. Signal intensity ratios (SIR) of carotid plaque relative to adjacent muscle were measured by MR plaque imaging (2D T1WI Black blood methods) **(Figure 1)**.

(CS) groups (n=102), respectively, and significantly higher at 1.935±0.234 in the group with PP than without PP. The cutoff was 1.62 in the PP group. SIRs >1.62 in MR plaque images indicated a high risk of PP. In such cases, CS instead of OS should be used to avoid PP during CAS. In the presentation, Dr. Katsutoshi Takayama concluded that plaque protrusion was the most important risk factor of ischemic complication during carotid artery stenting and SIR using MR plaque imaging might guide the stent selection strategies in the patients undergoing CAS.

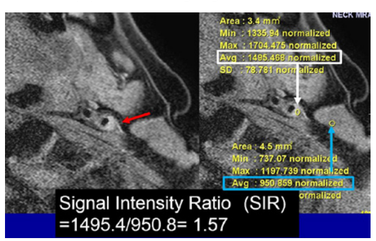


Figure 1. Plaque Protrusion during CAS

Dr. Katsutoshi Takayama and his team retrospectively analyzed PP occurred in 12/308 (3.9%) patients only in the OS group (n=206). The SIRs were 1.219±0.296 and 1.435±0.332 in the OS and closed cell stent

New Frontiers in Cardiology 3
Listening from the Expert and Pioneer in Cardiology
›› Saturday, Oct 13, 10:20-11:50 AM / Theatre

Yesterday's Hot Lives

Endovascular Treatment of Infrapopliteal Arteries in a Patient with Critical Limb Ischemia

Operator: Pil Hyung Lee, Katsutoshi Takayama, Kyu-Sub Lee

A 54-year-old male suffered from a rapidly progressing gangrene in the right forefoot that abruptly started 8 days ago. The patient was under hemodialysis and had diabetes, a history of myocardial infarction, and stroke. He already received below-the-knee amputation in the left extremity one year ago. The wound was combined with serious infection, thus the patient underwent urgent open trans-metatarsal amputation at the time of admission. Baseline angiogram showed significant diffuse stenosis at mid-level of SFA and tibioperoneal (TP) trunk, and total occlusion of the anterior tibial artery (ATA) and posterior tibial artery. The SFA was treated with a drug-coated balloon (Lutonix 5.0×150 mm) leaving less than 10 mmHg of a pressure difference between the proximal and distal portion of the lesion. The ATA was selected as the target vessel because relatively intact reconstituted lumen at the distal level was demonstrated. Because the ostium of ATA was ambiguous, and it was difficult to choose the correct vessel **(Figure 1)**, the operators decided to move on to a retrograde approach. With angiographic guidance, distal ATA was punctured with a 21 gauge, 4 cm micropuncture needle. The 0.014-inch Regalia CX guidewire was introduced with support of CXI microcatheter. After successful subintimal tracking at the occluded proximal ATA segment with a knuckle wire technique, the ostium of ATA was confidently identified according to the location of the retrograde wire. With the use of JR diagnostic catheter to overcome the steep angle of ATA stump, a 0.014-inch Command ES guidewire was successfully introduced in the same space of the retrograde guidewire. Wire rendezvous technique was successfully applied, and the antegrade wire was repositioned toward the true lumen at the distal ATA and dorsalis pedal artery. ATA was successfully recanalized, and the hemostasis of distal puncture site was achieved using the Amphirion DEEP 2.0×40 mm and Nanocross 2.0/2.5×210 mm balloons. The procedure was finished after further balloon angioplasty of TP trunk and peroneal artery, and the final angiography showed good distal flow **(Figure 2)**.

Figure 1

Figure 2

LAD CTO with Multiple Options for Different Strategies

Operator: Seung-Whan Lee, Pil Hyung Lee, Sang Yong Om

A 62-year-old male was admitted due to effort-related chest pain. He had a history of dyslipidemia and was an ex-smoker. Echocardiogram showed normal left ventricular systolic function without regional wall motion abnormality. Treadmill test demonstrated positive result at stage 1. The initial coronary angiogram showed triple vessel disease combined with chronic total occlusion (CTO) at left anterior descending artery (LAD) and left circumflex artery (LCX). After successful PCI at LCX and right coronary artery (RCA), a staged PCI was planned for the mid-LAD CTO lesion **(Figure 1)**. The CTO segment had a blunt stump and medial calcification. There was a lesion with moderate stenosis at the proximal LAD, and the septal to septal and RCA to septal collateral connections mainly supplied the LAD distal of the CTO segment. The right coronary artery was engaged with a 7 Fr AL1 guiding catheter, and left coronary artery was positioned with an 8 Fr XB 3.5 guiding catheter through the bi-femoral approach. A 0.003-inch SUOH guidewire was introduced into the distal LAD through the septal collateral channel. Heavy calcification at the CTO stump was identified by IVUS evaluation, thus a 0.014-inch Gaia second wire with Corsair® microcatheter support was selected for the antegrade approach. After successful penetration of the stump, the wire was de-escalated to the 0.014-inch Fielder XT wire. The Fielder XT wire was successfully introduced to the distal true lumen in guidance with the pre-existing SUOH wire. After several balloon dilatations at the CTO segment using Emergy 2.5 x 15 mm balloon, two Xience Sierra stents (2.5x28 mm and 3.5x28 mm) were deployed sequentially. IVUS guided landing zone selection, and stent optimization (using Lacrosse 3.5 x 15 mm noncompliant balloon) was performed. The final angiogram showed a good result without any complication **(Figure 2)**. By IVUS, diffuse narrowing at the far distal LAD was predominant due to negative remodeling, and was left without any procedure.

Figure 1

Figure 2

Minimalist TAVR in Severe AS with Heavily Calcified Leaflets

Operator: Seung-Jung Park, Duk-Woo Park, Yoon-Seok Ko

An 89-year-old male was admitted due to progressing shortness of breath (NYHA functional class II). He had a history of hypertension and diabetes, and was taking an oral anticoagulant for paroxysmal atrial fibrillation. Severe degenerative aortic stenosis combined with moderate aortic regurgitation was diagnosed based on the echocardiography **(Figure 1)**. Left ventricle systolic function was in normal range. The aortic valve was tricuspid in morphology, and the valve area was calculated to be 0.50 cm^2 by the continuity equation. Peak velocity and mean pressure gradient across the aortic valve was 6.5 m/s and 99 mmHg, respectively. The patient could be classified as an intermediate surgical risk candidate based on the STS score (6.77%). In CT measurement, the mean annulus diameter was 26.8 mm, the annular area was 520 mm^2 and the perimeter was 83.0 mm. The total amount of calcium was high up to 973 mm^3, predominantly located at the non-coronary cusp (618 mm^3). Distance from annulus to left main and right coronary artery ostium was 16.5 mm and 21.1 mm, respectively. According to the CT algorithm for sizing criteria of device selection, 26 mm Sapien 3 device corresponded to 99.8% and 29 mm device corresponded to 124.8% of the annulus area. Considering heavily calcified leaflets, 26 mm device with 2 cc overfill was selected rather than the 29 mm device for safety.

Under monitored anesthesia care, a temporary pacemaker was inserted through left femoral vein. 7 Fr sheath and 6 Fr pigtail catheter were inserted through the left femoral artery. 8 Fr sheath was inserted through the right femoral artery and replaced with 14 Fr expandable sheath under angio-guided puncture technique. Straight coil wire under back-up with an AL1 diagnostic catheter was successfully crossed through the stenotic aortic valve. Thereafter, straight coil wire was changed to the SAFARI pre-shaped TAVI guidewire. The aortic valve was pre-dilated with a 20 mm Edwards balloon. The device was placed at an optimal position under contrast angiography and was successfully deployed **(Figure 2)**.

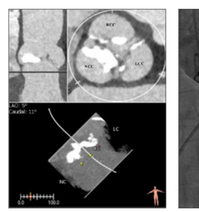


Figure 1

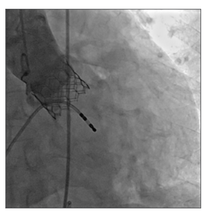


Figure 2

Because angiography and transthoracic echocardiography showed mild to moderate paravalvular regurgitation, post-balloon was applied with additional 1 cc overfilling (corresponding to 113.0% of the annulus area). The amount of paravalvular leakage was trivial, and the procedure was finished without any complications.

Vietnam-KSC Joint Symposium

Bifurcation PCI: Expert Tips and Data

Young Bin Song, MD, PhD
Sungkyunkwan University Samsung Medical Center, Korea

The side branch (SB) compromise during the procedure is associated with the increased risk of peri-procedural myocardial infarction and cardiac mortality. SB ostial disease and lesion length, proximal mitral valve (MV) stenosis, acute coronary syndrome, and narrow bifurcation angle are known to be independent predictors of SB compromise. Recent analysis of COBIS II registry found that jailed wire technique, SB predilatation, and intravascular ultrasound imaging (IVUS) guidance were not predictors of SB compromise. However, jailed wire technique is helpful to reopen the occluded SB. So, Dr. Song strongly recommend that you start with 2 guidewires when bifurcation lesion is complex. The most difficult branch is wired first. Then, the second wire is inserted while limiting the rotation maneuver to prevent wire-cross over because wire cross-over makes it difficult to deliver balloon or stent. In cases of difficult SB wiring, hydrophilic intermediate wire can be useful in avoiding wire prolapse, and microcatherter is helpful for better torquability and better curve formation. Ballooning main branch is also important step for successful SB wiring. The MV stent should be sized according to the distal MV reference diameter using IVUS to avoid SB compromise by plaque and carina shift. Adequate stent apposition in the proximal MV should be achieved by the proximal optimization technique (POT), which is a method of expanding the MV stent from the proximal stent edge to just proximal to the carina, using a non-compliant balloon. The POT might also facilitate the passage of a wire and a balloon into the distal struts on MV stent. The ostium of SB could be jailed by the stent struts across the MV, frequently along with SB ostial stenosis. Final kissing ballooning (FKB) is mandatory after SB ballooning because FKB can correct stent deformation caused by dilation through the side of the MV stent. Recently, POT-side-POT has been proposed as alternatives to FKB. First POT is performed just after MV stenting for facilitating the wire crossing and ballooning. If SB treatment is needed, SB is rewired and treated with SB ballooning. SB ballooning will result in the MV stent deformation and stent carina shift into MV, which can be corrected by second POT, instead of FKB. Compared to conventional FKB, POT-side-POT (also known as re-POT) is simpler and can be done through a smaller guiding catheter.

The SMART-STRATEGY trial sought to compare conservative and aggressive strategies for non-left main (LM) bifurcations and LM bifurcation lesions in order to determine the optimal indications for SB ballooning and/or stenting in the provisional approach. The SMART-STRATEGY trial found that conservative strategy for provisional SB intervention, compared with the aggressive strategy, provides better long-term clinical outcomes, mainly due to lower crossover rate to the 2-stent technique. Therefore, provisional approach with conservative strategy for SB intervention should be considered for most bifurcation lesions.

Broad Complex Tachycardia in Emergency Room: Treatment Strategies

Phong Phan Dinh, MD, PhD
Vietnam National Heart Institute, Vietnam

Broad QRS complex tachycardia is a rhythm with a rate of ≥100 beats/min and QRS duration of ≥120 ms. If the rhythm is regular (or relatively regular), monomorphic ventricular tachy-cardia or supraventricular tachycardia (SVT) with pre-existing bundle branch block (BBB), aberrancy (BBB due to heart rate), intraventricular conduction disturbance, antidromic atrioventricular reentrant tachycardia (AVRT) should be differentiated. If the rhythm is irregular, atrial fibrillation/flutter/tachycardia with abberancy/bundle branch block/pre-exitation (WPW) or polymorphic ventricular tachycardia or torsades de pointe should be differentiated.

The differential diagnosis of a broad QRS complex tachycardia (BCT) mechanism represents a great diagnostic dilemma commonly encountered by the practicing physician at the emergency room, which has important implications for acute arrhythmia management, further work-up, prognosis and chronic management as well. ECG remains the cornerstone of BCT differential diagnosis with the use of different ECG criteria and algorithms; however, it's not always the case.

Broad complex tachycardias can be VTs (80%) or SVTs with aberrancy (20%). In emergency room, assume and manage a broad complex tachycardia as VT is recommended until proven otherwise. A pulseless or hemodynamically compromised patient with a BCT requires cardiac arrest management and prompt cardioversion to restore sinus or background rhythm. A stable patient with BCT can be treated with antiarrhythmic infusions. Emergency radiofrequency catheter ablation and other specific managements can be consider in some circumstances. The practicing physician should follow the algorithms.

VNHA-KSC Joint
Complex PCI in Asia
›› Saturday, Oct 13, 08:40-10:10 AM / Grand 1

Case

Successful Pulmonary Arterial Stenting in Peripheral Pulmonary Arterial Stenosis in RNF-213 Mutation Related Vasculopathy

So Ree Kim, MD
Sungkyunkwan University Samsung Medical Center, Korea

A 26-year-old man with previous diagnosis of suspicious pulmonary arterial hypertension, chronic thromboembolism, and Behcet's disease was referred to our hospital. He had history of carotid artery stenosis, mesenteric artery stenosis, and renal artery stenosis and represented severe pulmonary hypertension with right ventricular systolic dysfunction. His pulmonary angiography demonstrated multiple pulmonary arterial stenosis with beaded appearance. His genetic diagnosis was finally revealed as nonsyndromic peripheral pulmonary artery stenosis associated with homozygosity of RNF213 p.Arg4810Lys which is an associated gene of Moyamoya disease.

Due to severe pulmonary hypertension and symptoms of right ventricular failure, pulmonary balloon angioplasty was tried to relieve peripheral pulmonary arterial stenosis. Elastic recoil was found immediately after pulmonary arterial balloon angioplasty, therefore, pulmonary arterial stenting was performed after balloon angioplasty (Left A1, A8, A9, A10, and Right A8, A1) **(Figure 1).**

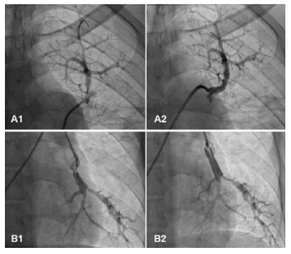


Figure 1. A. Left A1 pulmonary artery before (A1) and after (A2) stenting.
B. Left A9 pulmonary artery before (B1) and after (B2) stenting.

Mean pulmonary arterial pressure was 47 mmHg before stenting and 31 mmHg after stenting. Patient's symptom was improved and NT proBNP was decreased (from 1,173 pg/mL to 168 pg/mL). Walking distance in 6 minutes walk test was also increased from 443 m to 516 m. Aspirin and clopidogrel was prescribed for a month and aspirin was maintained.

This is the first case of multiple stenting to peripheral pulmonary arterial stenosis in RNF213 mutation related vasculopathy.

Case Zone 3
Intervention
›› Friday, Oct 12, 12:40-13:50 PM / Vista B3

Hypertension

Definition of Hypertension

Il Suk Sohn, MD, PhD
Kyung Hee University Gangdong Hospital, Korea

Hypertension is one of the leading causes of the global burden of non-communicable disease. Approximately one third of adults worldwide have hypertension. Hypertension doubles the risk of cardiovascular diseases, including coronary heart disease, heart failure, stroke, renal failure, and peripheral arterial disease. In adults, there is a continuous, incremental risk of cardiovascular disease, stroke, and renal disease across levels of both systolic and diastolic blood pressure (BP). Results of a meta-analysis involving almost 1 million participants indicate that ischemic heart disease mortality, stroke mortality, and mortality from other vascular causes are directly related to the height of the BP, beginning at 115/75 mmHg, with cardiovascular disease risk doubling for every 20 mmHg increase in systolic and 10 mmHg increase in diastolic pressure.

In adults, normal BP is defined as a systolic pressure below 120 mmHg and a diastolic pressure below 80 mmHg (120/80 mmHg) **(Figure 1)**. Hypertension is defined as the BP threshold above which antihypertensive drug therapy has shown to have clinical benefit in reducing cardiovascular events based on the evidence of randomized clinical trials. It affects around 29% of adults in the South Korea. Traditionally, the threshold for systolic BP has been 140 mmHg. However, the updated guideline in the United States classifies hypertension as a BP reading of 130/80 mmHg or higher.

Current clinical criteria for defining hypertension generally are based on the average of two or more seated BP readings during each of two or more outpatient visits. Home BP and average 24-h ambulatory BP measurements are generally lower than clinic BPs. Because ambulatory BP recordings yield multiple readings throughout the day and night, they provide a more comprehensive assessment of the vascular burden of hypertension than do a limited number of office readings. Increasing evidence suggests that out-of-office BP, including home BP and 24-h BP recordings, more reliably predict target organ damage than do office BPs.

Target Blood Pressure for Specific Conditions

Sang -Hyun Ihm, MD, PhD
Catholic University Bucheon St. Mary's Hospital , Korea

Until the 2017 American College of Cardiology/American Heart Association (ACC/AHA) Hypertension (HTN) Guidelines were released, the target blood pressure (BP) for adults with HTN was 140/90 mmHg in most HTN guidelines. Although there were differences among guidelines, more intensive BP lowering had been recommended for those with proteinuric chronic kidney disease (CKD) (target BP: 130/80 mmHg) or diabetes. The 2017 ACC/AHA guidelines recommend target BP levels below 130/80 mmHg in all hypertensive patients independently of comorbid disease or age. However, the new 2018 European Society of Hypertension/European Society of Cardiology (ESH/ESC) HTN guidelines have maintained <140/90 mmHg for the primary target BP in all patients and if tolerable, and encourage reduction to <130/80 mmHg except elderly and CKD patients (not systolic BP <120 mmHg or diastolic BP <70 mmHg). Recently, 2018 Korean Society Hypertension (KSH) guidelines have been released.

In HTN patients with low to moderate risk, evidence from randomized controlled trials (RCTs), meta-analyses, and post hoc analysis of large-scale RCTs all showed no obvious incremental benefit of lowering BP to <130/80 mmHg. Therefore, 2018 KSH HTN guidelines recommend an office BP target of <140/90 mmHg in low to moderate risk HTN patients. However, for adults with confirmed HTN and known cardiovascular disease (CVD: ≥50 years old patients with coronary artery disease [CAD], peripheral artery disease [PAD], aortic disease, heart failure and left ventricular hypertrophy [LVH]), or a 10-year CVD risk of 15% or more, a BP target of 130/80 mmHg is recommended according to the Systolic Blood Pressure Intervention Trial (SPRINT) and recent meta-analysis. In elderly HTN patients, systolic BP goal of <140 mmHg is recommended for noninstitutionalized ambulatory community-dwelling adults (≥65 years of age) but diastolic BP should not be below 60 mmHg. Most patients with diabetes (DM) and HTN should be treated to a BP goal of <140/85 mmHg. However, for adults with confirmed HTN and known CVD, a BP goal of <130/80 mmHg is recommended according to the recent post hoc analysis of Action to Control Cardiovascular Risk in Diabetes (ACCORD) study.

Recent major RCTs failed to show any beneficial effect of strict BP control in non-proteinuric CKD patients. Accordingly, CKD patients without albuminuria are recommended to maintain BP <140/90 mmHg. On the other hand, RCTs suggested that a lower target may be beneficial in proteinuric CKD patients. Thus, we recommend that CKD patients with albuminuria should be treated to maintain BP <130/80 mmHg independently of the presence of DM. In the HTN patients with previous stroke, BP goal is recommended to maintain the BP <140/90 mmHg. But patients with lacunar infarction, a BP goal of <130/80 mmHg may be reasonable.

Category		Systolic BP (mmHg)		Diastolic BP (mmHg)
Normal blood pressure		<120	AND	<80
Elevated blood pressure		120~129	AND	<80
Prehypertension		130~139	OR	80~89
Hypertension	Stage 1	140~159	OR	90~99
	Stage 2	≥160	OR	≥100
Isolated systolic hypertension		≥140	AND	<90

Figure 1. Classification of blood pressure in the Korean Society of Hypertension Guideline.

Hypertension 1
Understanding the 2018 Korean Society of Hypertension Guidelines
›› Saturday, Oct 13, 08:40-10:10 AM / Cosmos

JCS-KSC Joint Symposium: AMI

2018 Update of Expert Consensus Statement on Antiplatelet Therapy in East Asian Patients with ACS or Undergoing PCI

Young-Hoon Jeong, MD, PhD
Gyeongsang National University Changwon Hospital, Korea

East Asians are the most populous race in the world, and their health status is an important global issue. Compared with the Western populations, East Asian patients have different benefit/risk ratio during antithrombotic treatment **(Figure 1)**.

Despite this observation, treatment strategies in East Asian patients are mostly based on American and European guidelines. In spite of a lower platelet inhibitory response to clopidogrel, East Asian patients show a similar or even a lower rate of ischemic event occurrence and higher bleeding risk compared with Caucasian patients. For potent P2Y12 inhibitors (ticagrelor and prasugrel), East Asian patients have shown less favorable net clinical benefits compared with Caucasian patients, which may be related to differences in pharmacokinetic/pharmacodynamic profiles and therapeutic zone of antiplatelet agents. This updated consensus mainly focuses on state-of-the-art and current controversies in the East Asian population. In addition, when potent P2Y12 receptor inhibitors are administered in East Asian patients, the strategies and ongoing trials to overcome the related hurdles are discussed.

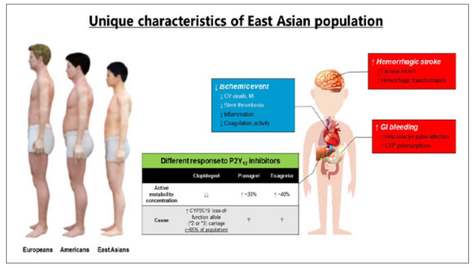


Figure 1. Unique characteristics of East Asian population

Coronary Intervention and Antiplatelet Therapy in Aging Society of Japan; Lessons from Nationwide Real-world Database of the Japanese Acute Myocardial Infarction Registry (JAMIR)

Satoshi Yasuda, MD, PhD
National Cerebral and Cardiovascular Center, Japan

Antiplatelet therapy is a cornerstone of treatment following acute myocardial infarction (AMI). Recently, a new and potent antiplatelet agent has been introduced in clinical practice. The Japanese AMI registry (JAMIR) is a multicenter, nationwide registry enrolling patients with AMI. Retrospective JAMIR consisted of 20,462 AMI patients (mean age, 68.8±13.3 years; 15,281 men [74.7%]) hospitalized between January 2011 and December 2013. The rates of ambulance use and emergency percutaneous coronary intervention (PCI) were 78.9% and 87.9%, respectively. The median door-to-balloon time was 80 min (interquartile range, 53-143 min). Overall in-hospital mortality was 8.3%, including 6.6% due to cardiac death. JAMIR included 4,837 patients aged ≥80 years (23.6%). In this age group, patients who underwent PCI (79.9%) had significantly lower in-hospital mortality than those who did not (11.1% vs. 36.9%, p<0.001). Prospective JAMIR started enrollment in December 2015. By the end of July 2017, a total of 3,425 patients (mean age 68.1±13.2 years, 23.4% female) were registered from 50 sites. ST elevation myocardial infarction (STEMI) accounted for 77% of patients with AMI. 8.9% of patients had a history of atrial fibrillation, and 9.8% of patients had malignancy. Of note, 97% of patients underwent emergent coronary angiography and primary PCI was performed in 93% of patients overall. During hospitalization, almost all patients were treated with aspirin (99.1%). The most frequent P2Y12 inhibitor used was prasugrel (82.1%), followed by clopidogrel (17.5%). Warfarin and direct oral anticoagulants (DOACs) were administered to 6.2% and 7.4% of patients, respectively. In conclusion, JAMIR could provide important information regarding contemporary practice patterns of AMI in the aging society of Japan.

JCS-KSC Joint Symposium: AMI
2018 Update of Expert Consensus Statement on Antiplatelet Therapy in East Asian Patients with ACS or Undergoing PCI
›› Saturday, Oct 13, 14:00-15:30 PM / Theatre

Abstracts

Twenty-Year Experience with Truncus Arteriosus Repair: Changes in Risk Factors in the Current Era

Yoonjin Kang, MD
Seoul National University Children's Hospital, Korea

The clinical outcomes of truncus arteriosus (TA) repair have been improving and few data are available on long-term survival and freedom from reoperation after TA repair. The aim of this study was to evaluate long term outcome and associated risk factors after repair of TA in the modern era.

Fifty-one patients underwent total correction of TA from April 1982 to June 2018. Since 2003, perioperative strategy has changed toward minimal priming volume, routine modified ultrafiltration, and early total repair. Patients were divided into two groups. Group I included patients underwent operation before 2003 (n=24), and group II included those after 2003 (n=27). Mortality and reoperation rate (conduit change or truncal valve [TV] repair/replacement) were analyzed.

Mean age at initial total repair was 7 months. There were 8 hospital deaths after initial operation all before 1997. During the mean follow-up of 9.8 years, there were 2 late deaths. The Kaplan-Meier estimate of survival among all hospital survivors was 94.7% at 5 years and 88.0% at 20 years. An independent risk factor for early mortality was operation before 2003 (p=0.024) and REV procedure (p=0.042). Forty-three patients underwent reoperations (TV repair/replacement (n=11), pulmonary artery angioplasty (n=27), and conduit change (n=35)). Freedom from any reoperation was 88.3% and 41.0% at 1 and 5 years, respectively. Age at operation, conduit size, and initial TV regurgitation were significant risk factors in group I. However, larger conduit size was the only risk factor in group II (p=0.033). The independent risk factor for conduit related reoperation were low body weight (p=0.015) in group I and younger age at operation (p=0.003) and choices of the conduit (p=0.005) in group II. Freedom from reoperation for TV at 1 and 5 years was 96.2% and 85.4%, respectively. Initial TV regurgitation was a significant risk factor for sequential TV repair or replacement only in group I (p=0.028).

Technical modifications and improved perioperative management altered risk factors for outcomes after TA repair. However, most of the patients require reoperations, with larger initial conduit size, younger age at operation, and choices of conduit being an additional risk factor.

Oral Abstracts
Pediatric Cardiology 1
›› Friday, Oct 12, 08:40-10:10 AM / Calla

Continued on page 9

Meet the Editor-in-Chief: Publish or Perish-Insights from the Editors

Arteriosclerosis, Thrombosis, and Vascular Biology

Alan Daugherty, PhD
University of Kentucky, USA

Arteriosclerosis, Thrombosis, and Vascular Biology (ATVB) is one of the five core journals of the American Heart Association. Since its inception in 1981, it has been a published home for basic, translational, clinical, and population research in a broad spectrum of vascular physiology and pathology. Papers are accepted from laboratories across the globe. Submitted manuscripts are evaluated by an international group of editors who represent the countries that are the source of the majority of submissions. The breadth of expertise of these editors means that all manuscripts are shepherded through the evaluation process by subject experts who are dedicated to identifying the optimal reviewers that provide fair and balanced critiques in a timely manner. Currently, the mean interval of submission to first decision is 14 days.

ATVB is primarily focused on publishing high quality original research articles. To maintain the quality of published research, the editors are complying with widely accepted guidelines for basic, clinical, and population research. The most recent focus is complying with the United States National Institutes of Health guidelines on rigor and reproducibility for preclinical research. These guidelines focus on optimizing study design, validation of reagents, statistical analysis, and complete reporting. In addition to original research articles, ATVB also publishes brief reviews, theme based review series, and research guidelines.

In this session, Dr. Alan Daugherty will summarize editors' visions that readers will find ATVB to be a comprehensive source of high quality information in vascular diseases.

JACC: Cardiovascular Interventions - Year 1 of Version 2.0

David J. Moliterno, MD
University of Kentucky, USA

Academic year 2018 was the inaugural year for the new editorial board for JACC: Cardiovascular Interventions. Between July 2017, when the new groups started, and June 2018, we received 2,527 manuscripts (including de novo resubmissions) or about 10 papers processed and handled each weekday. This number includes original research papers, editorials, viewpoints, image cases, and research correspondences. Considering calendar year 2017, we accepted 579 papers, of which 177 were original research papers (acceptance rate for original research papers was 14.4%). Of these original research papers, the distribution was 56% coronary artery interventions, 32% structural heart interventions, and 12% peripheral interventions. Of the 24 issues published over the last year, 18 had a focused section or were a focused issue, while the remaining covered a range of topics in coronary, peripheral, and structural interventions.

As in prior years, the majority (70%) of papers come from outside the United States, with the leading countries being Canada, China, France, Germany, Italy Japan, Korea, the Netherlands, Spain and the United Kingdom. Regarding scientific works submitted from Korea, the number has increased roughly 5% each year. In 2014, the journal received 48 manuscripts from Korea and during 2017, we received 55 (so, on average more than 1 per week!). The numbers are on track to be even higher in 2018. During this same interval (2014-2017), the average acceptance rate for papers submitted from Korea was 17.2%.

Publishing high-quality papers that are of interest and value to our readers is among our top priorities. And among the markers for high-value papers are those cited by other publications—which translates into the journal's impact factor and the journal's citation ranking among cardiovascular journals. Both remain quite impressive for JACC: Cardiovascular Interventions. The impact factor (number of times papers published in the 2 prior years are cited relative to all original papers published by the journal) for 2017 increased substantially from 8.84 to 9.88 evidencing the top-quality papers being received and published in the journal. Dr. King left us with great momentum, and he was hopeful they will continue the upward trajectory. The editorial team for JACC: Cardiovascular Interventions has been terrific and busy for more than a decade. The team with Dr. King was successful and enjoyed having Dr. Seung-Jung Park as an Associate Editor. Likewise, version 2.0 is very fortunate to have Dr. Bon-Kwon Koo as an Associate Editor. Going forward, there is a lot on the horizon for the editors, and we have a long-term vision on how to improve the journal for its readers.

Meet the Editor-in-Chief
Publish or Perish - Insights from the Editors
›› Saturday, Oct 13, 14:00 - 15:30 PM / Cosmos

Continued from page 8

A Prospective Survey of the Persistence of Warfarin or NOAC in Nonvalvular Atrial Fibrillation: a Comparison Study of Drugs for Symptom Control and Complication Prevention of Atrial Fibrillation (CODE-AF)

Hyeongsoo Kim, MD
Yonsei University Severance Hospital, Korea

Efforts to reduce stroke in patients with atrial fibrillation (AF) have focused on increasing physician adherence to oral anticoagulant (OAC) guidelines; however, the high early discontinuation rate of vitamin K antagonists (VKAs) is a limitation. We compared the persistence of NOAC and VKA treatment for AF in real-world practice.

In a prospective observational registry (CODE-AF registry), 7,013 patients with nonvalvular AF (mean age 67.2±10.9 years, women 36.4%) were consecutively enrolled between June 2016 and June 2017 from 10 tertiary hospitals in Korea. This study included 3,381 patients who started OAC 30 days before enrollment (maintenance group) and 572 patients who newly started OAC (new-starter group). The persistence rate of OAC was evaluated.

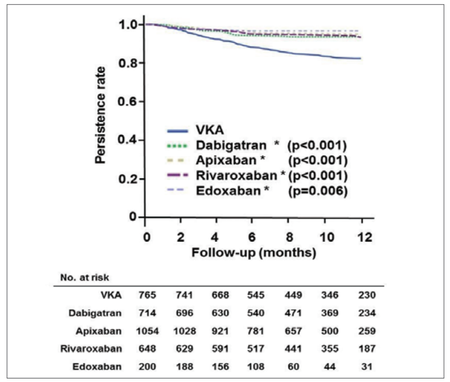


Figure 1. Persistence rate in the maintenance group

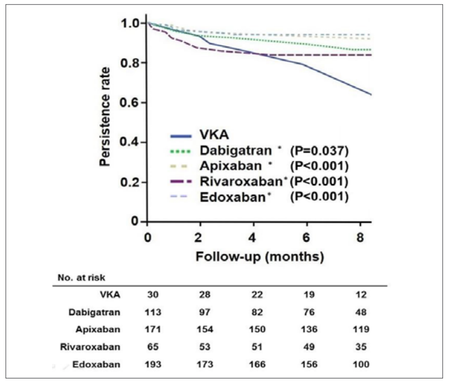
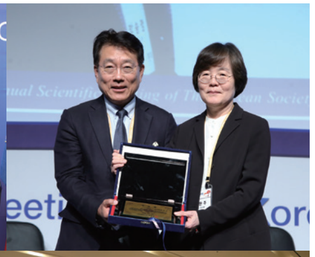


Figure 2. Persistence rate in the new-starter group

In the maintenance group, persistence to OAC declined during 6 months, to 88.3% for VKA and 95.5% for NOAC (p<0.0001) **(Figure 1)**. However, the persistence rate was not different among NOACs. In the new-starter group, persistence to OAC declined during 6 months, to 78.9% for VKA and 92.1% for NOAC (p<0.0001) **(Figure 2)**. The persistence rate was lower for rivaroxaban (83.7%) than apixaban (94.6%, p<0.001) and edoxaban (94.1%, p<0.001). In the new-starter group, diabetes, valve disease, and cancer were related to nonpersistence of OAC.

Nonpersistence was significantly lower with NOAC than VKA in both the maintenance and new-starter groups. In only the new-starter group, apixaban or edoxaban showed higher persistence rates than rivaroxaban.

Oral Abstracts
Arrhythmia 4
›› Friday, Oct 12, 10:20-11:50 AM / Grand 4




ACHD Symposium

Failing Fontan Hemodynamics and Its Management

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Hong Kong University, China

Fontan-type procedures are palliative for patients with functional single ventricles. Since its first report in 1971, the initially described operation has undergone several modifications, from atriopulmonary connection through lateral tunnel to extracardiac conduit procedures. With volume unloading of the systemic ventricle after Fontan-type procedures, acquired myocardial hypertrophy and progressive ventricular remodeling occur and impact on cardiac function and mechanics. Ventricular diastolic abnormalities are characterized by early impairment of relaxation in association with incoordinate myocardial relaxation and late worsening of ventricular compliance. Progressive systolic ventricular dysfunction, related to multifactorial etiologies including an increased systemic afterload, atrioventricular regurgitation, and alteration of myocardial architecture, may eventually occur. Alterations of cardiac mechanics in Fontan circulation are characterized by reduced systolic and diastolic ventricular myocardial deformation, ventricular mechanical dyssynchrony, and abnormal pulmonary venous atrial deformation consistent of impaired atrial pump, conduit, and reservoir function. Beyond the heart, the systemic and pulmonary vascular beds also exhibit hemodynamics that may adversely affect the Fontan circulation. Increase in the pulsatile and nonpulsatile components of the arterial load may contribute to abnormal ventriculo-arterial coupling, while the lack of pulsatile pulmonary flow may lead to progressive increase in pulmonary vascular resistance with reduction of shear stress-mediated release of endothelium-derived vasodilators and capillary recruitment, pulmonary thromboembolism, pulmonary arterial distortion, and pulmonary venous obstruction. These unfavorable cardiac mechanical and hemodynamic factors, coupled with the development of cardiac arrhythmias, herald the failure of the Fontan physiology. Failing Fontan is clinically evidenced by exercise intolerance, abdominal distension, diarrhea, physical findings of fluid retention, cardiomegaly, and hepatomegaly, and laboratory findings of hypoalbuminaemia, thrombocytopenia, hyperbilirubinaemia, and coagulopathy. Management of the failing Fontan circuit would be discussed from three perspectives; (1) medical therapies in terms of the use of pulmonary and systemic vasodilators, warfarin and aspirin therapy, and management of protein losing enteropathy and plastic bronchitis, (2) catheter-based interventions for tackling residual obstructive lesions, occlusion of collaterals, creation of fenestration, and valve implantation, and (3) surgical interventions including Fontan conversion, use of mechanical circulatory support, and cardiac transplantation.

ACHD 1
ACHD with Problem
›› Saturday, Oct 13, 08:40-10:10 AM / Grand 2

What are the Criteria for Fontan versus One-and-a-Half Ventricle versus Biventricular Repair?

In structural congenital heart disease, the success of complete cardiac septation results in a biventricular repair, while at the other end of the spectrum, failure of septation requires Fontan-type procedures to channel systemic venous blood directly to the pulmonary circulation. There are situations in which the right heart may be considered from the morphological and/or physiological perspectives to be insufficient to support the pulmonary circulation. One-and-a-half ventricular repair, introduced by Billingsley et al in 1982, has hence been applied to situations in which the subpulmonary right ventricle is considered inadequate and requires partial offloading by a cavopulmonary anastomosis. The inadequacy may be due to the smallness of the right ventricle as in pulmonary atresia with an intact ventricular septum or a dilated poorly functional right ventricle as in the setting of Ebstein's anomaly. Additionally, there are situations in which certain degree of surgical septation is possible but may result in a smallish subpulmonary ventricle that constitutes a concern for biventricular repair. These include inlet ventricular septal defects with straddling tricuspid valve, multiple muscular ventricular septal defects with a hypoplastic right ventricle, complete transposition of the great arteries with ventricular septal defect and small tricuspid valve and right ventricle, and complete atrioventricular septal defect in

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association with tetralogy of Fallot, double-outlet right ventricle and left ventricular dominance. Evidence to date suggests that one-and-a-half ventricular repair can be performed relatively safely with patients doing reasonably well clinically in the early to intermediate terms. Nonetheless, more pertinent questions would need to be answered: What size or level of functioning of the subpulmonary ventricle should this approach be considered? Have the theoretical and perceived benefits of one-and-a-half ventricular repair over the biventricular approach, and at the end of the other spectrum, over Fontan-type procedures been defined? What are the long-term issues of the one-and-a-half ventricular repair? Would this approach constitute the destination therapy for selected congenital heart patients? In this talk, these issues would be debated and discussed.

ACHD 2
ACHD with Solution
›› Saturday, Oct 13, 10:20-11:50 AM / Grand 2

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