Sixteenth Annual Scientific Congress

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• REVIEW ARTICLE
Infective Endocarditis Chemoprophylaxis for Adults: New Guidelines
Kelvin Kai-Wang To, Chu-Pak Lau, Cyrus-Rustam Kumana ..................1

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Infective Endocarditis Chemoprophylaxis for Adults: New Guidelines

KELVIN KAI-WANG TO,1 CHU-PAK LAU,2 CYRUS-RUSTAM KUMANA2

From 1Department of Microbiology, Queen Mary Hospital; 2Department of Medicine, The University of Hong Kong, Queen Mary Hospital, Hong Kong SAR

TO ET AL.: Infective Endocarditis Chemoprophylaxis for Adults: New Guidelines. The concept of infective endocarditis chemoprophylaxis has undergone dramatic changes in recent few years, as exemplified by the latest guidelines from the British Society for Antimicrobial Chemotherapy (BSAC) and the American Heart Association (AHA). Although there are minor differences between the two, both guidelines agree that having a dental procedure is not an important risk factor and that chemoprophylaxis is not required except for patients at high risk if they develop infective endocarditis. It is important for cardiologists, dentists and other health care professionals to be aware of this change in order not to overprescribe antimicrobial prophylaxis. (J HK Coll Cardiol 2008;16:1-4)

Infective endocarditis, new chemoprophylaxis guidelines

Abstract

Infective endocarditis (IE) is associated with significant morbidity and mortality. Traditionally, we were taught that for patients at increased risk of infective endocarditis (such as those with structural cardiac defects, including prosthetic valves), antibiotic prophylaxis was a requirement to cover dental procedures. This practice was based on the belief that high grade bacteraemia resulting from such procedures could give rise to IE and that bactericidal antibiotic concentrations in the blood at the relevant time could prevent this complication. Owing to the rarity of IE, clinical trial evidence for such interventions was always lacking. Nevertheless chemoprophylaxis guidelines for IE became enshrined in medical folklore, possibly driven by medicolegal considerations. Both British and American authorities therefore started to issue consensus IE chemoprophylaxis guidelines, to cover dental as well as other potentially bactericidal procedures (Table 1), and these were updated at intervals of 3-4 years. However, the most recent guidelines published by the British Society for Antimicrobial Chemotherapy (BSAC)1 and the American Heart Association (AHA)2 have challenged our traditional practices, particularly with respect to dentistry (Tables 2-5).

The pathogenesis of IE has been well described elsewhere. Briefly, turbulent flow created by structural
Table 1. Traditional risk factors warranting chemoprophylaxis against infective endocarditis

<table>
<thead>
<tr>
<th>Moderate risk</th>
</tr>
</thead>
<tbody>
<tr>
<td>Congenital heart &amp; great vessel abnormalities (not for uncomplicated atrial</td>
</tr>
<tr>
<td>septal defect or ligated patent ductus arteriosus)</td>
</tr>
<tr>
<td>Heart valve abnormality (especially regurgitation)</td>
</tr>
<tr>
<td>MV prolapse with regurgitation</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>High risk</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prosthetic (tissue or synthetic) heart valve</td>
</tr>
<tr>
<td>Implanted AV or VA shunt</td>
</tr>
<tr>
<td>Previous infective endocarditis</td>
</tr>
</tbody>
</table>

Table 2. According to latest guidelines, only the following high risk groups warrant prophylaxis

<table>
<thead>
<tr>
<th>BSAC guideline 2006</th>
<th>Previous infective endocarditis</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Cardiac valve replacement surgery</td>
</tr>
<tr>
<td></td>
<td>Surgically constructed systemic or pulmonary shunt or conduit</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>AHA guideline 2007</th>
<th>Prosthetic cardiac valve</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Previous infective endocarditis</td>
</tr>
<tr>
<td></td>
<td>Congenital heart disease (CHD)</td>
</tr>
<tr>
<td></td>
<td>Unrepaired cyanotic CHD, including palliative shunts and conduits</td>
</tr>
<tr>
<td></td>
<td>Completely repaired congenital heart defect with prosthetic material or device,</td>
</tr>
<tr>
<td></td>
<td>whether placed by surgery or by catheter intervention, during the first 6</td>
</tr>
<tr>
<td></td>
<td>months after the procedure</td>
</tr>
<tr>
<td></td>
<td>Repaired CHD with residual defects at the site or adjacent to the site of a</td>
</tr>
<tr>
<td></td>
<td>prosthetic patch or prosthetic device</td>
</tr>
<tr>
<td></td>
<td>Cardiac transplantation recipients who develop cardiac valvulopathy</td>
</tr>
</tbody>
</table>

Lesions damages the endothelium. Deposition of platelet and fibrin results in the formation of nonbacterial thrombotic endocarditis. Bacteria, which may be present in blood after every day activity (chewing, defaecation) or invasive procedures, can adhere to such traumatized sites and proliferate to form a vegetation.

Since antibiotic prophylaxis can reduce the magnitude of such bacteraemias, theoretically it could also reduce the incidence of IE. Moreover, animal experiments confirm that used in this way, antibiotics reduce the risk of developing endocarditis on damaged valves. Yet extrapolation of such animal data to man warrants caution, for a number of reasons. First, the bacterial inoculums used in these experiments (10^6-10^8 CFU/ml) far exceeded those resulting from dental and other procedures (<10^4 CFU/ml). Second, patients with periodontitis actually produce bacteraemia of similar magnitude to those ensuing after tooth brushing, chewing and scaling. In the same study, healthy controls (without periodontitis) were found to have a much lower chance of detectable bacteraemia after similar every day activities, indicating that good oral hygiene is paramount in reducing the extent of transient bacteraemia. It has been estimated that the cumulative exposure to such every day bacteraemia may be as high as 5-6 million times greater than after a single tooth extraction. Both British and American opinion leaders have therefore concluded that the risk from an individual dental procedure is minimal, compared to the cumulative risk of random bacteraemias from daily activities, (brushing the teeth and chewing). Third, with regard to clinical studies, it must be conceded that the results from case control studies were inconsistent. Finally, it appears that the risk of serious adverse effects from taking antibiotics could well outweigh the risk of IE after...
### Table 3. Adult – Dental procedures*

<table>
<thead>
<tr>
<th></th>
<th>BSAC guideline 2006</th>
<th>AHA guideline 2007</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Standard regimen (oral)</strong></td>
<td>Amoxicillin 3 g po 1 hour before procedure</td>
<td>Amoxicillin 2 g po given 30-60 min before procedure</td>
</tr>
<tr>
<td><strong>Special situation (oral)</strong></td>
<td>Clindamycin 600 mg po 1 hour before procedure</td>
<td>Cephalaxin 2 g po or Clindamycin 600 mg po or Azithromycin or clarithromycin 500 mg po given 30-60 min before procedure</td>
</tr>
<tr>
<td>Allergic to penicillin or ampicillin</td>
<td>If unable to swallow capsules: Azithromycin 500 mg po 1 hour before procedure</td>
<td>(Cephalosporins should not be used in an individual with a history of anaphylaxis, angioedema or urticaria with penicillins or ampicillin)</td>
</tr>
<tr>
<td>Recent use of amoxicillin or ampicillin</td>
<td>Amoxicillin 3 g po 1 hour before procedure</td>
<td>Amoxicillin 2 g po given 30-60 min before procedure</td>
</tr>
<tr>
<td><strong>Standard regimen (IV)</strong></td>
<td>Amoxicillin 1 g IV just before procedure or at induction of anaesthesia</td>
<td>Ampicillin 2 g IM/IV or Cefazolin or Ceftriaxone 1g IM/IV given 30-60 min before procedure</td>
</tr>
<tr>
<td><strong>Special situation (IV)</strong></td>
<td>Clindamycin 300 mg IV just before procedure or at induction of anaesthesia</td>
<td>Cefazolin 1g IM/IV or Ceftriaxone 1 g IM/IV or Clindamycin 600 mg IM/IV 30-60 min before procedure</td>
</tr>
<tr>
<td>Allergic to penicillin or ampicillin</td>
<td>Clindamycin 300 mg IV just before procedure or at induction of anaesthesia</td>
<td>(Cephalosporins should not be used in an individual with a history of anaphylaxis, angioedema or urticaria with penicillins or ampicillin)</td>
</tr>
<tr>
<td>Recent use of amoxicillin or ampicillin</td>
<td>Clindamycin 600 mg IV just before the procedure or at induction of anaesthesia</td>
<td>Cefazolin 1g IM/IV or Ceftriaxone 1 g IM/IV or Clindamycin 600 mg IM/IV 30-60 min before procedure</td>
</tr>
</tbody>
</table>

*All dental procedures that involve manipulation of gingival tissue or the periapical region of teeth or perforation of the oral mucosa

### Table 4. Adult – Genitourinary, gastrointestinal, respiratory or obstetrics/gynaecology procedures*

<table>
<thead>
<tr>
<th></th>
<th>BSAC guideline 2006</th>
<th>AHA guideline 2007</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>General</strong></td>
<td>Amoxicillin 1 g IV + Gentamicin 1.5 mg/kg IV given just before the procedure or at induction of anaesthesia</td>
<td>Not required</td>
</tr>
<tr>
<td><strong>Allergic to penicillin</strong></td>
<td>Tetracycline 400 mg IV + Gentamicin 1.5 mg/kg IV given just before the procedure or at induction of anaesthesia</td>
<td>Not required</td>
</tr>
</tbody>
</table>

*Cystoscopy, urethral dilatation, transurethral prostatic resection, transrectal prostatic biopsy, vaginal hysterectomy, Caesarian section

### Table 5. Adult – Nasal packing or nasal intubation

<table>
<thead>
<tr>
<th></th>
<th>BSAC guideline 2006</th>
<th>AHA guideline 2007</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>General</strong></td>
<td>Fluoxacillin 1 g IV given just before the procedure or at induction of anaesthesia</td>
<td>Not required</td>
</tr>
<tr>
<td><strong>Allergic to penicillin</strong></td>
<td>Clindamycin 600 mg IV given just before the procedure or at induction of anaesthesia</td>
<td>Not required</td>
</tr>
</tbody>
</table>
dental procedures; the risk of a fatal anaphylactic reaction may be as high as 1 in 40,000.\textsuperscript{10}

Thus, it is now agreed that antibiotics prophylaxis is only indicated in those who are at highest risk if they develop IE, in which case potential benefits may outweigh the risks. Moreover, by eliminating the moderate risk group, antibiotics regimens are much simpler.

For non-dental procedures, including gastrointestinal (GI) and genitourinary (GU) procedures, the AHA has abolished antibiotic prophylaxis altogether for all patients, including those at highest risk. Although these procedures may be associated with transient enterococcal bacteraemia, the evidence for a link between GI or GU tract manoeuvres and IE is weak, and there are no studies demonstrating that such measures were likely to be efficacious. By contrast, the BSAC has taken a more cautionary approach to the lack of evidence, and decided to retain antibiotic prophylaxis for both the moderate and high risk patients.

The latest guidelines are by no means gold standards, since there has never been a randomized controlled trial of outcome to address these issues. Indeed, British Guidelines published by different authorities are inconsistent. For example, in the September 2007 issue of the British National Formulary, the moderate risk group is retained.\textsuperscript{11} At the other extreme, the guideline published by NICE in March 2008 has proposed abolishing antibiotic prophylaxis for IE, even for the high risk group.\textsuperscript{12}

We believe that the changes in both the latest AHA and BSAC guidelines provide practical advice for patients undergoing dentistry. For all complex cases, expert opinion should be sought.

References

10. Ahlstedt S. Penicillin allergy--can the incidence be reduced? Allergy 1984;39:151-64.
Hong Kong College of Cardiology

Sixteenth Annual Scientific Congress

May 2-4, 2008
Sheraton Hong Kong Hotel and Towers
Hong Kong

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Scientific Programme

Friday, May 2, 2008

08:00  Registration

08:30-10:30  Free Paper Session
Coronary Artery Disease
Electrophysiology and Cardiac Arrhythmia

Hands-on Workshop on Cardiac Computed Tomography
Workshop 1

10:30-11:00  Coffee Break
Visit Exhibits

11:00-13:00  Free Paper Session
Hypertension and Hyperlipidemia
Heart Failure

Hands-on Workshop on Cardiac Computed Tomography
Workshop 2

13:00-14:15  Light Lunch

14:15-16:15  Free Paper Session
Percutaneous Coronary Intervention
Valvular Heart Disease

Hands-on Workshop on Cardiac Computed Tomography
Workshop 3

Paediatric Cardiology Symposium I
What's New in Devices and Other Fun Stuff
John P. Cheatham

Vasovagal Syncope in Children
Junbao Du

Genetic Basis of Congenital Heart Disease
Guoying Huang

Pulmonary Stent Implantation: New Era for the Treatment of Congenital Heart Disease in Infants and Young Children
Kun Sun

Experimental Study of New Type Atrial Septal Defect Occluder Surface Modified by TiN Ceramic Film
Zhiwei Zhang

Oscillometrically Measured Blood Pressure in Hong Kong Chinese Children and Associations with Anthropometric Parameters
Rita Yn-tz Sung

16:15-16:45  Coffee Break
Visit Exhibits
16:45-18:45  **Free Paper Session**  
Cardiac Imaging  
Cardiac Surgery  
Miscellaneous  

19:00-20:30  **Plenary Lectures**  
Recent Advances in Cardiac Computed Tomography  
*Michael Poon*  
Clinical Roles of Cardiac MR & CT in Everyday Clinical and Advanced Applications  
*Michael Poon*  

20:30-22:00  **Welcome Dinner**  

**Saturday, May 3, 2008**  

08:00  **Registration**  

08:30-09:30  **Best Paper Oral Presentation**  

08:30-10:30  **Hands-on Workshop on Cardiac Computed Tomography**  
Workshop 4  

09:30-10:30  **Plenary Lectures**  
IVUS Guided Left Main Stenting  
*Jianfang Luo*  
Cardiovascular Risk Factors in Chinese Population  
*Yong Huo*  

09:30-10:30  **Allied Cardiovascular Health Professionals Symposium**  
Management of Cardiac Emergencies  
Latest Guidelines on Cardiopulmonary Resuscitation  
*Andy Wai-kwong Chan*  
Highlights on Use of Intra-aortic Balloon Pump and Percutaneous Cardiopulmonary Bypass  
*William Chi-kin Chan*  

10:30-11:00  **Coffee Break**  
Visit Exhibits  

11:00-12:00  **Plenary Lectures**  
How to Evaluate the Vulnerable Plaque  
*Yundai Chen*  

What is the Best Treatment for AMI Patients?  
*Harry Suryapranata*
Current DES Issues and Future Platforms
*Rosli Mohd Ali*

**Allied Cardiovascular Health Professionals Symposium**
**Management of Cardiac Emergencies**
Recognition and Treatment of Life-threatening Arrhythmias
*Ngai-yin Chan*

Management of Hypertensive Emergencies
*Kin-ming Tam*

**Hands-on Workshop on Cardiac Computed Tomography**
Workshop 5 (1st session)

12:00-13:30  
**Lunch**

13:30-14:30  
**OrbusNeich Symposium**
Latest Clinical Update on Genous Technology
*Federico Piscione*

Selection of Stents in AMI Patients
*Harry Suryapranata*

**Hands-on Workshop on Cardiac Computed Tomography**
Workshop 5 (2nd session)

14:30-15:15  
**Opening Ceremony**

15:15-16:45  
**Medtronic Symposium**
New Horizons in Interventional Cardiology
*Alan C. Yeung*

Optimal Late Loss May Be Desirable for Neointimal Healing Following Stenting: Angioscopic Comparison Between Sirolimus- and Zotarolimus-eluting Stents
*Masaki Awata*

Technical Aspects in CTO Intervention
*Junbo Ge*

**Paediatric Cardiology Symposium II**
Hybrid Procedures for Complex Congenital Heart Disease
*John P. Cheatham*

Postoperative Interventional Catheterization for Congenital Heart Disease
*Adolphus Kai-tung Chau*

15:15-17:15  
**Hands-on Workshop on Cardiac Computed Tomography**
Workshop 6

16:45-17:15  
**Poster Session (Paediatric)**
Coffee Break
Visit Exhibits
17:15-18:45  **Plenary Lectures**  
Cardiovascular Risk and Atherosclerosis: Implications from Recent Imaging Trials  
*Anton F.H. Stalenhoef*

Are We Misunderstanding Beta-blockers  
*John Malcolm Cruickshank*

New Trends of Angiotensin Receptor Blocker Therapy in the Cardiovascular Continuum  
*Cheuk-man Yu*

17:15-19:15  **Free Paper Session**  
Paediatric Cardiology III & IV

19:00-20:30  **Plenary Lectures**  
Proton Pump Inhibitors and the Use of Anti-platelet Therapy  
*Francis Ka-leung Chan*

Stent Selection for AMI PCI in 2008 – DES or BMS?  
*Chung-seung Chiang*

20:30-22:00  **Dinner**

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**Sunday, May 4, 2008**

08:00  **Registration**

08:30-10:30  **Hands-on Workshop on Cardiac Computed Tomography**  
Workshop 7

08:45-10:40  **Plenary Lectures**  
Treatment for AMI Patients  
*Huay-cheem Tan*

Consensus and Controversies in the Treatment of Coronary Bifurcation Lesions  
*Yves Louvard*

Update the Management of ACS & STEMI with the Recent Guidelines – Putting Evidence into Clinical Practice  
*Yuk-kong Lau*

Experience in Next Generation DES  
*Ashok Seth*

10:40-11:00  **Coffee Break**  
Visits Exhibits

11:00-13:00  **PCI Cases Discussion**  
**Prize Presentation**
11:00-13:00  Hands-on Workshop on Cardiac Computed Tomography
Workshop 8

13:00-14:30  Lunch

14:30-16:00  Plenary Lectures
New Therapeutic Approach on Achieving Goal in Hypertension Management
Chung-yin Chen

CRT-D in Isolated Ventricular Noncompaction in Adults
Akihiko Nogami

Selective Site Pacing in Atrial Arrhythmia Prevention
Ngai-yin Chan

14:30-16:30  Hands-on Workshop on Cardiac Computed Tomography
Workshop 9

16:00-17:00  EPS Cases Presentation
Ngai-shing Mok
Steve Wai-keung Lai

17:00-17:30  Coffee Break
Visit Exhibits

17:30-18:30  Symposium on Automated External Defibrillator (AED) Programme in Hong Kong
Experience of Hong Kong College of Cardiology
Kathy Lai-fun Lee

Experience of Hong Kong St. John Ambulance
Peter Cho-yiu Wong

18:30-19:30  Cardiac CT & MRI Cases Presentation
Anna Kin-yin Chan
Carmen Wing-sze Chan

19:30-21:00  Farewell Dinner
ABSTRACTS

Abstracts for Free Paper Session:

CORONARY ARTERY DISEASE

1. Clinical profile of young patients (<45 years old) having coronary angiogram for suspected or known coronary artery disease in a regional hospital

John T Wung, CK Chan, KF Longa, CS Yue. Division of Cardiology, United Christian Hospital, Hongkong.

Introduction: Coronary artery disease (CAD) is the second commonest cause of death in Hong Kong and 1000 people die of the disease annually. Although the burden of CAD in the community is increasing and the mean age of the people affected is getting younger, there are scarce local data regarding those with CAD younger than 45 years.

Method: All patients aged below 45 years with suspected or known CAD who had undergone invasive coronary angiography (ICA) in a cardiac catheterisation laboratory of UCH during the period of November 2006 to December 2007 were included. Data concerning their baseline demographics and clinical characteristics, treatment modalities, and outcomes were collected throughout the CMS for analysis.

Results: ICA was performed on 42 patients during the study period. Their mean age was 41 ± 4.2 years. The majority of them were males (88%). 25 patients (60%) underwent ICA for the assessment of chronic stable angina, while the others were for that of acute coronary syndrome (8 had ST elevation myocardial infarction (MI), 8 had non-ST elevation MI and 1 had unstable angina). The prevalence of hypertension, hyperlipidemia (LDL > 2.4 mmol/L), current smoking, diabetes mellitus (DM) and obesity (BMI > 30) was 31%, 37%, 38%, 21% and 12% respectively. Two patients (4.7%) had prior history of MI and 6 patients (14%) had percutaneous coronary intervention (PCI) performed previously. Thirty-six patients (86%) had normal left ventricular ejection fraction (LVEF) > 50%. 5 patients had LVEF between 35-50% and only 1 patient had LVEF less than 35%. About half of them (52%) of patients had significant disease (14 patients had normal coronary, 7 had mild diffuse disease and 10 had eccentric vessels) and twenty patients (48%) had significant disease (luminal diameter stenosis > 70% in any vessel). Fourteen patients (70%) had single vessel disease and 2 patients (4.7%) had triple vessel disease. Almost all patients (98%) with significant CAD had PCI performed. Each patient had a mean of 1.2 vessels and 1.5 lesions treated. Mean follow-up period was 201 ± 97 days. There was one sudden death (2.4%) few months after PCI, which occurred in a female patient who had unsuccessful stent implantation by end-stage renal failure, significant peripheral arteriosclerotic disease and had multiple recurrent MIs. Otherwise there were no recurrent MIs or repeated revascularization in this cohort of patients.

Conclusion: Although the number of patients in this study was small, it provided some useful information in regard to this particular group of relatively young CAD patients. Overall, about half of them (82% of ACS and 24% of chronic stable angina patients) had ICA would have significant CAD that required treatment.

2. Follic acid and vitamin B12 supplementation improves arterial function and structure in subjects with subnormal intake

TWC Yang, P Cheok, SK Kwong, YJ Hu, HS Hang, GG Wang, MJ Wu, YM Liu, CWK Lam, DS Cheung, KS Wai

Yau Chai Hospital, The Chinese University of Hong Kong; Alice Ho Miu Ling Nethersole Hospital, Chinese University of Medical Science; Guangdong Provincial Cardiovascular Institute, Fu Wai Hospital, Sun Yat San University Second Affiliated Hospital, the University of Sydney.

Background: Folate and vitamin B12 deficiency is prevalent in northern rural China and is associated with atherosclerosis.

Methods: To further test the impact of folate acid (FA) and vitamin B12 (B12) supplementation for atherosclerosis prevention, 207 asymptomatic subjects (127 males, 80 females) in rural Shanxi (Yu County) were randomised to receive oral B12 (500mg/day), FA (5mg/day), B12+FA, or image-matched placebo in a double-blind, 2x2 factorial trial for 6 months, followed by open label B12-FA for 6 more months. Brachial flow-mediated dilatation (FMD) and carotid intima-media thickness (IMT) were measured by B-mode ultrasound and automated edge-detecting software.

Results: Mean age was 45 ±5.3 years and total cholesterol 4.170 ±0.54 mmol/L. Blood B12 and folate values were low at baseline, but significantly increased at 6 months after FA, B12, and B12+FA (p<0.001), and not after placebo treatment, associated with a significant decrease in fasting blood homocysteine (HC) and blood pressure (p<0.01).

FMD increased significantly at 6 months after the 3 active treatments but not after placebo. Further improvement in FMD (6.8±1.4% to 8.2±1.4%, p<0.001) and a trend towards improvement in IMT (0.71±0.13mm to 0.69±0.14mm, p=0.05) at 12 months were seen after additional B12+FA open late treatment.

Conclusions: B12 and FA supplementation, either alone or in combination, improves arterial endothelial function and carotid IMT in northern rural Chinese, suggesting a novel and affordable atherothrombotic prevention strategy potentially in China.

3. Impact of cold and very hot weather warnings on hospitalization and mortality from acute myocardial infarction in a regional hospital in Hong Kong

Dr. LK Chan, Dr. CW Cheng, Dr. KY Lee, Dr. KT Chan, Dr. D Ho, Dr. KC Ho, Dr. CS Cheung

Purpose: Hong Kong experiences both hot and cold seasons. Hong Kong Observatory would post cold and very hot weather warnings according to the weather changes. This study tried to set any association between the occurrence of hospitalization and mortality from acute myocardial infarction and the weather warning in Queen Elizabeth Hospital.

Methods: Retrospective study. Identification of AMI, mortality from AMI during weather warnings and warning free periods from 01/04/2007 to 20/02/2009 at Queen Elizabeth Hospital were retrieved from CDARS electronic medical registry. The latest age-specific population sites in the region of Yau Tsim Mong district was retrieved from the Census department. Poisson regression models were tried to evaluate associations between warming and hospitalization, mortality considering 6-7-day lag periods. Data version 9.0 was used.

Results: A total of 99 patients (93 patients (49%) >70 years old) were admitted to the hospital and was diagnosed to have AMI as principal diagnosis in the registry during cold weather warning and 21 patients (10 patients (96%) >70 years old) during very hot weather warning. 28 (28%) died during cold weather warning while 5 (5%) during hot weather warning (6-7 day lag). A total of 695 patients were admitted due to AMI during the whole study period. Strong association was observed in 6-7 day lag analysis in which the incidence rate ratio (IRR) of hospitalisation during cold warning vs normal period was 1.77 (95% CI 1.56-1.98) IRR under hot warning vs normal was 1.13 (95% CI 1.02-1.26). IRR of group>75 yrs vs <75 yrs old was 40.91 (95% CI 37.87-44.16), goodness-of-fit p = 0.59. Similar but weaker association was observed between cold warning and normal time in 6-7 day lag period, (IRR = 1.52 for hospitalization, 1.51 for mortality) both IRR for hospitalisation and mortality during hot warning vs normal were 0.53 and 0.45 respectively in 6-7 day lag period, increased to 1.13 and 1.47 respectively in 6-7 day lag period.

Conclusion: Hospitalization and mortality rate were significantly increased during cold weather warning with a 6-7 day lag in our community. Inverse association during very hot weather warning in 6-7 day lag period and vice versa at 6-7 day lag period might be due to real situation or lack of sufficient data. IRR of hospitalisation of elderly >70 years old, current smoking, diabetes mellitus (DM) and obesity (BMI > 30) was 31%, 37%, 38%, 21% and 12% respectively. This information could be used by hospitals to plan staffs utilization and bed allocation. In addition, special care to the elderly during weather warning should be alerted by the appropriate authority. A further detailed prospective study with different time periods and longer study times might be more accurate to determine the association of weather warning at different time.

Pitfall: Data might be due to retrospective data collection from the electronic registry. Data may not be truly accurate in view of diagnosis coding.

4. Effect of Climate factors on Onset of Acute Myocardial Infarction

Zhang SW, Fong QA. Department of Cardiology, First Hospital, Shanshi Medical University. Tianyuan, Shanshi, China.

Purpose: To investigate effect of climate factors on onset of acute myocardial infarction (AMI) in Tianyuan, China.

Methods: A total of 1,668 consecutive patients (pts) with AMI admitted to 4 coronary care units from Jan 1999 to Dec 2003 were collected for retrospective studies. Generalized Additive Model (GAM) was used to reveal the relation between AMI and atmospheric pressure, temperature, relative humidity, rainfall and wind speed.

Results: Atmospheric pressure: When atmospheric pressure at 950-9500pa, there was no relation between the atmospheric pressure and the onset of AMI. But when the atmospheric pressure increased above this range, the onset of AMI raised. The onset of AMI were relative to atmospheric pressure significantly (p=0.023). Temperature: When the temperature between 15-20°C, there was no relation between the temperature and onset of AMI, and when T<15°C there was a negative relation. If T>20°C, there was a tendency with a high onset of AMI (p=0.003). The relative humidity (p=0.035) and wind speed (p=0.065) were related with the onset of AMI significantly. The weather factors with lag effect in 5 day was atmospheric pressure (p=0.077) and temperature (p=0.035).

Conclusions: The results suggested that the onset of AMI was significantly influenced by climatic factors including the atmospheric pressure, temperature, relative humidity and wind speed in the day.

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ABSTRACTS

Abstracts for Free Paper Session:

5. Circumcision of acute myocardial infarction
Feng QA, Zhang SW. Department of Cardiology, First Hospital, Shaxi Medical University, Taiyuan, Shanxi, China

Purpose: To investigate circumcision and season variant of acute myocardial infarction (AMI) in Taiyuan region and evaluate the effect of age, sex, hypertension and diabetes

Methods: A total of 1668 consecutive patients (pts) with AMI admitted to 4 coronary care units from Jan 1999 to Dec 2003 were collected for retrospective studies. Circumcision, week and season variant were analyzed with the circular distribution. The influence of age, sex, by ptension and diabetes were analyzed.

Results: There was a marked circumcision variant of the onset of AMI (p < 0.001). The median was at 7:00 am. There were no significant difference between the younger group (≤ 60 years old) and the older group (≥ 60 years old) for circumcision variant of the onset of AMI (p > 0.05).

The median for the former was at 7:21 am, the latter was at 6:51 am. The circumcision variant was more pronounced in male than that in female (p < 0.05). The onset in pts with hypertension was one hour earlier than that in pts without hypertension (p < 0.05). There was no marked circumcision variant of the onset of AMI (p > 0.05) in pts with diabetes. There were significant yearly variation (0.005 < p < 0.01) in the events and the median was in Jan 1. The yearly variation was more pronounced in the older group than that in the younger group (p < 0.05).

Conclusion: The analyses demonstrated that there was marked circumcision variant in the occurrence of AMI in Taiyuan region. There was no significant circumcision variant in female.

There was significant yearly variation in pts in elderly group, pts with hypertension and pts with diabetes.

6. An audit of use of aspirin, B-blockers, ACEIs and statins in patients with acute myocardial infarction in a regional hospital in Hong Kong
Dr. LR Chan, Dr. CW Cheng, Dr. KY Lee, Dr. KT Chan, Dr. D Hua, Dr. KC Hua, Dr. CS Chiang

Purpose: A, B-blockers, ACEIs, statins were proven to be useful in many RCTs in decreasing mortality in patients with AMI. However, good compliance to the drugs is essential in order to have the target outcome. This article reviews the rate of usage of these drugs in Queen Elizabeth Hospital and suggests any improvement.

Methods: Retrospective study. Incidence of AMI, mortality from AMI, use of aspirin, B-blockers, ACEIs, statins from 01/01/2002 to 31/12/2002 and 01/01/2003 to 31/12/2003 in Queen Elizabeth Hospital were retrieved respectively from CDARS electronic medical registry. Chi-square test, State version 9.0 was used to compare the differences 2002 and 2003.

Results: A total of 749 patients were diagnosed to have AMI as principal diagnosis in the registry in 2002 and 710 patients in 2003. 172 of 749 patients (23%) were labelled AMI as cause of death in 2002 whereas 197 out of 710 in 2003 (28%) (no significant difference, p > 0.14). Majority of the mortality were patients aged ≥75 years old (37% of total AMI death in 2002 vs 33% of total AMI death in 2001 (p = 0.482). 344 (47%) who were diagnosed with AMI were ≥75 years old in 2002 whereas 393 (55%) in 2003 (significant increase, p = 0.005, elder age: 99 in 2002 vs 102 in 2003). For the use of aspirin, a total of 654/799 patients (83%) were given aspirin in 2002 compared with 786/710 (107%) in 2003 (p = 0.009). B-blockers usage (55/799 (8%) in 2002 vs 96/710 (14%) in 2003 (p = 0.045)). There was no significant difference between 2002 and 2003 with regard to other drugs.

Conclusion: Incidence and mortality rate were similar in 2002 and 2003 respectively with no significant difference. Most of the mortality were in patients aged ≥75 years old. High rate of use of aspirin in 2003. Reasons might be due to increase use of other anti-platelet agent, clopidogrel (which may not be documented in the registry) or other indication of usage of anti-platelet bleeding (not investigated in this study). Usage rate of B-blockers (20-45%). ACEIs (65-55%). Usage of statins may need further evaluation in 2002 and 2003. it might be related to decrease in awareness of the prescription of co-morbidities (eg, age, renal failure). Although there was a significant increase in use of aspirin from 2002 to 2003. Reasons might be due to increase in use of other anti-platelet agent, clopidogrel (which may not be documented in the registry) or other indication of usage of anti-platelet bleeding (not investigated in this study)

7. Risk Factors Profiles and Extent of Coronary Artery Disease in Chinese women
WJ Hsu,a; YH Chen,b; MCheng,a; STChu,a; KKCChen,a; LINChen,a; CYWong,a; HSMa; LYTam,c; CWCChen,c; CWCheng,c; WYLee,c; JHSCH; SCChiang,c

From the Division of Cardiology, Department of Medicine, Queen Elizabeth Hospital, Hong Kong

Purpose: Prevalence status has been shown to decrease the risk of coronary artery disease in women. However, there are still premenopausal women who suffer from coronary artery disease and yet both local and international data are scarce in this group of patients.

Method: A retrospective study to compare the risk factors of premenopausal and postmenopausal Chinese women with coronary artery disease admitted to Queen Elizabeth Hospital between 2003 and 2007. The records of 40 premenopausal women were successfully retrieved, reviewed and were statistically compared with another randomized group of 47 postmenopausal women with coronary artery disease.

Results: There was a significant prevalence of coronary artery disease (DM, HT, hyperlipidemia, smoking) are similar between premenopausal and postmenopausal women, which also compose a large prevalence in both groups. However, impaired renal function and family history of premature CAD are significant risk factors in premenopausal women, who tend to present with more severe coronary artery disease, namely three vessel disease or critical left main disease (47.5% vs 19.5%, p < 0.01).

Conclusion: Conventional risk profiles of coronary artery disease (DM, HT, hyperlipidemia, smoking) are similar between premenopausal and postmenopausal women, which also compose a large prevalence in both groups. However, impaired renal function and family history of premature CAD are significant risk factors in premenopausal women, who tend to present with more severe coronary artery disease, namely three vessel disease or critical left main disease (47.5% vs 19.5%, p < 0.01).

8. A study on the correlation between the microorganisms in coronary atherosclerosis plaques and periodontal pathogenic bacteria
Zhang Yuanming, He Bingxian, Liang Feng, Zhen Yong, Liang Lianxiang. Department of Cardiology, The First Affiliated Hospital of XiangJing Medical University, Anhuji 200054, China

Purpose: The aim of this study was to identify the microorganisms detected in coronary atherosclerosis plaques of different patients and to compare them with periodontal bacteria from subgingival plaque samples of the same patients.

Methods: A total of 51 patients scheduled for coronary artery bypass graft were enrolled in this study. Coronary atherosclerosis plaques were harvested during surgical procedure for each patient and then sent to the biochemical laboratory. A sample of subgingival plaque was collected from the deepest pocket of each patient. Subgingival plaque samples and atheroma plaques specimens were examined using the polymerase chain reaction (PCR) technique by means of specific primers for periodontal bacteria. PCR products were sequenced and were compared with the GenBank to ensure their alignment. The DNA concentration was estimated by measuring absorbance at a wavelength 260 nm using a spectrophotometer.

Results: The presence of periodontal bacterial DNA in coronary atherosclerotic plaques and the subgingival plaque samples of the same patients could be confirmed by this study and thus a correlation could be established between species associated with periodontal disease and putative bacteria contributing to atheromatous plaques. In coronary atherosclerotic plaques of 51 patients, Porphyromonas gingivalis (31.3%), Tannella forsythia (formerly fusobacterium forsythia) (31.1%), Prevotella intermedia (18%), and Fusobacterium nucleatum (24%) were found. In subgingival plaque samples of 51 patients, T. forsythia (84%), F. nucleatum (78%), P. intermedia (59%), P. gingivalis (39%) and A. actinomyctetemcomitans (22%) were found.

Conclusion: The presence of T. forsythia, F. nucleatum, P. intermedia, P. gingivalis in coronary atherosclerosis plaques and the subgingival plaque samples of the same patients could indicate a role for periodontal pathogenic bacteria in the atherosclerosis disease process. 

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9. Do Congenital Anomalies of the Coronary Circulation Predispose to Coronary Artery Disease?
Dr. TS Chung, Dr KF Leung, Dr CK Chau, Dr TH Wong, Dr CS Yue. Division of Cardiology, Department of Medicine and Geriatrics, United Christian Hospital, Kowloon, Hong Kong.

Background: Anomalous origin of coronary arteries and coronary fistulae are 2 common anomalous findings during coronary angiogram in adults. There are scarce local data of the clinical characteristics and relationship of coronary artery disease (CAD) and congenital coronary anomalies.

Methods: Cardiac catheterization reports of patients having coronary angiogram done in United Christian Hospital from 1996-2006 were reviewed. A total of 6997 patients were reviewed. Their first cardiac catheterization reports were reviewed and those with documented anomalous coronary artery origin and coronary fistula were selected. Their cines were reviewed. A reference group of 100 patients were randomly selected by computer program from remaining patients with no congenital coronary anomalies. We focused on coronary fistula and coronary anomalous origin from opposite aortic cusp. The severity of stenosis of anomalous arteries were compared with the patient’s own other two congenitally normal coronary arteries. Further statistical analysis was performed for those two groups of patients.

Result: A total of 96 patients (1.3%) had documented coronary artery anomalous origin and 45 patients (0.65%) had coronary fistula. Forty-nine (51.0%) had anomalous coronary arteries from opposite aortic cusp. Forty-two anomalous coronary origin from opposite aortic cusp (85%) were Right Coronary Artery (RCA). RCA anomalous origin was associated with significantly more severe coronary artery stenosis when compared with LAD or LCx ( p < 0.001). The difference of severity of stenosis between different coronary arteries was not significant in the reference group.

Conclusion: Among local Chinese, congenital anomalies of the coronary circulation are not uncommon (2%). RCA anomalous origin from opposite cusp was more likely to have coronary artery disease than congenitally normal LAD and LCx.

10. Outcome of Patients with Low Prettest Clinical Score for Coronary Artery Disease Referred for Exercise ECG Test
Lung-lung Chung, Kwok-fai Leung, Chiu-sun Yue, Division of Cardiology, Department of Medicine and Geriatrics, United Christian Hospital, Hong Kong SAR, China.

Aim: Exercise prettest nomogram has widely been used as a way to stratify patients with symptoms of suspected coronary artery disease (CAD) and it was well known for its prognostic value. Prettest score was not routinely calculated most of the time, however its accuracy in estimating probability of CAD has been well studied. The purpose of the study was to explore whether prettest score could help in risk stratification of patients before exercise treadmill test.

Methods: Between January 2004 and June 2004, we screened the treadmill reports of all patients ≥18 years of age referred for assessment of symptoms suggestive of CAD. We excluded asymptomatic patients, those receiving digitalis, those with history of CAD (prior myocardial infarction or CAD confirmed with either other stress test or coronary angiography), and those with resting ECGs that were considered unreliable (pre-excitation syndrome, electrolytically paced rhythms, >2mm ST depression and complete LBBB). We collected baseline clinical information from patients during pre-exercise ECG interview. Validated prettest clinical scoring and exercise prettest nomogram using Duke treadmill score were utilized for risk stratification. Clinical outcome data was collected from patients’ record for analysis.

Result: A total of 586 treadmill reports were reviewed, among which 50% were males. In patients with low prettest score (115 patients), their post treadmill prognostic risk was low in 87% (94%), intermediate in 13% (6%), high in 4% (5%). In patients with intermediate prettest score (329 patients), their post treadmill prognostic risk was low in 62%, intermediate in 21%, high in 16%. In patients with high prettest score (121 patients), their post treadmill prognostic risk was low in 40%, intermediate in 32%, high in 22%. At about 3.5 years after treadmill exercise ECG test, among 115 patients with low prettest score, 13 of them underwent further investigation of CAD (post treadmill risk: low 5/94, intermediate 4/16, high 4/15). 4 have normal cardiac scan (1 from low and 3 from intermediate post treadmill risk category), 10 have normal coronary angiogram (3 from low, 5 from intermediate and 2 from high post treadmill risk category). The remaining patient came from the low prettest score and low post treadmill risk category. His treadmill report reviewed inadequate stress and therefore cardiac scan was carried out which showed LAD stenoma. Coronary angiogram showed there was an 80% mLAD lesion which was then tackled with PCI. Among all those with low prettest score, there was no reported cardiovascular/ cerebrovascular events or all-cause mortality.

Conclusion: Among 80% of patients with low prettest clinical score was stratified by treadmill as low risk (i.e. annual mortality < 1%). Their clinical outcome was good. Even those with low prettest score stratified by treadmill as intermediate or high risk, the clinical outcome was also good. It appears that to manage conservatively and defer the treadmill exercise ECG in this group of patients is safe. Further larger scale survival study is warranted to confirm this observation.

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11. Intermediate follow up of patients undergoing catheter ablation for atrial fibrillation

Sze WK, Lau, Simon L Chow, YH Chan, KL, Chau, ML, Wong, KC Ko, KK Teo. Department of Medicine & Geriatrics, Tuen Mun Hospital

Background: Catheter ablation for atrial fibrillation (CAAF) currently evolves as an important therapy for patient with symptomatic drug refractory atrial fibrillation (AF). Short-term efficacy of this procedure is promising. However, intermediate and long-term result is unclear.

Method: Fourteen consecutive patients undergoing CAAF were reviewed. Procedure records and subsequent follow up notes were studied from the clinical management system.

Results: Altogether, there were 2 procedures. They included 8 males (57.1%) with mean age of 57.1 ± 5.9 years. Twelve patients (85.7%) suffered from paroxysmal atrial fibrillation and 2 patients suffered from persistent atrial fibrillation. Seven patients (50%), and 2 patients (13.5%) had hypertension and diabetes mellitus respectively. One patient (7.1%) suffered from stroke with good recovery and 2 patients (14.2%) had history of congestive heart failure. Two patients suffered from sick sinus syndrome had dual chamber pacemaker implanted before their procedures. Six patients (42.9%), 4 patients (29.2%), and 9 patients (64.3%) had an ablation catheter and 3 patients (21.4%) respectively. The mean duration of AF prior to their first CAAF was 4.9 ± 3.1 years (0.7–10 years). Eight patients (57.1%), 3 patients (21.4%) and 3 patients (21.4%) underwent 1, 2, and 3 procedures respectively. The mean follow up duration from their first procedure was 19.5 ± 5 months (2.2–33 months). Four patients (28.6%), 2 patients (14.3%) and 2 patients (14.3%) remained asymptomatic without AAD, and with 1 AAD respectively. Five patients (35.7%) had more than 90% symptom improvement. One patient (7.1%) had only partial symptom improvement. One patient (7.1%) remained asymptomatic 3 months after his second procedure but he defaulted follow up afterwards.

Four patients (28.6%), 4 patients (28.6%), and 3 patients (21.4%) had discontinued anti-arrhythmic therapy, continued to take aspirin, and continued to take warfarin respectively. One patient was complicated by transient ischemic attack and had complete recovery and. 1 patient suffered from urinary tract infection primarily due to faulty catheter insertion during the operative period. No patient was complicated by thromboembolic event, significant pulmonary vein stenosis nor cardiac tamponade. No patient suffered from thromboembolic event after discontinuation of anti-thrombotic therapy

Conclusion: Intermediate outcome of CAAF is satisfactory. There is incremental benefit from repeated CAAF procedure.

12. Optimization of Left Ventricular Lead Implantation During Cardiac Resynchronization Therapy Procedure by Echocardiography

Ngai Yin Chan, Chan Leung Lai, Ying Keung Lo, Kar Chun Cheang, Chi Chung Choy, Pui Shan Chan, Ho Chun Yuan, Suei Ting Lai, Yuen Choi Choi. Department of Medicine & Geriatrics, Princess Margaret Hospital

Introduction: Acute hemodynamic improvement, chronic clinical benefits and LV reverse remodeling in CRT patients has been shown to be dependent on location of implanted LV lead. Feasibility of detailed mapping of resynchronization effects (Re) of all accessible LV sites for CRT optimization, during implant procedure by transesophageal echocardiography (TTE) has not been studied.

Method: Patients with NYHA Class III/IV heart failure, LVEF≤35%, QRS≥120ms and septal-lateral delay (α)≥50ms on TDI, underwent CRT implant with TTE mapping of Re by acquiring apical 2, 3 and 4-chamber views during biventricular pacing at each accessible LV site (apical, mid and proximal part of different cardiac veins). SLV α α at each site was obtained. Synchronicity gain index (Sg) is defined as 1-(αRe-α), LV lead was then implanted at an empirical site. Concordance between implant site and site with positive resynchronization (Re, Sg>1 or highest Sg was reviewed.

Results: TTE mapping was attempted in 14 patients (11M, age 66.8±9.0) and performed successfully in all, with 73 sites mapped. R+ was achieved in 68.5% (53/73) of all sites, 68.8% (11/16) posterior cardiac vein (PCV), 80% (4/5) posterolateral cardiac vein (PLCV), 56.2% (16/29) lateral cardiac vein (LCV), 100% (2/2) anterolateral cardiac vein (ALCV), 56.3% (9/16) great cardiac vein (GCV) and 62% (8/13) middle cardiac vein (MCV) sites. R+ was achieved in 83.3% (10/12) apical, 71% (22/31) mid and 63% (19/30) basal LV sites. R+ was more likely to be achieved at apical than mid or basal LV sites (p=0.001) and at PCV/PLCV/ALCV/GCV sites (p=0.001). The sites with highest Sg were at PCV/PLCV/ALCV/GCV in 10 (71.4%) and at GCV/MCV in 4 (29.6%) patients. A significantly higher Sg was achieved in the best than the worst site in a particular TTE site (1.65±0.19 vs 0.87±0.5, p<0.001). Empirical LV lead implantation sites correspond to sites with highest Sg in 5 (35.7%) and sites with R+ in 10 (71.4%) patients.

Conclusion: Acute Re quantified by Sg in CRT is dependent on LV lead location. TTE for LV lead implant site optimization during CRT procedure is both feasible and essential for localization of pacing sites with R+ or preferably with highest Sg.

13. DNA-based diagnosis of familial cardiac arrhythmias in the post-genomic era

Chung-Wan Lam, Department of Chemical Pathology, The Chinese University of Hong Kong, Prince of Wales Hospital, Hong Kong, China

DNA-based diagnosis of genetic disease is the preferred method because the fundamental abnormalities in genetic diseases are DNA sequence changes—the genotypes. Approximately half of the disease-causing mutations actually affect the DNA sequences rather than affecting the gene products—the encoded proteins. Varrét all these mutations will mostly produce a null phenotype. For most genetic testing, few milliliters of whole blood are sufficient for PCR-based genetic analysis. In the past few years, we have performed mutational analysis of a number of genes related to familial cardiac arrhythmias, e.g. catecholaminergic polymorphic ventricular tachycardia, long QT syndrome and Jervell and Lange-Nielsen syndrome. For DNA-based diagnosis of these genetic diseases, a direct mutation detection and identification was employed. A diagnostic method based on direct detection of genetic mutation is: 1) definitive 2) 100% sensitivity and 100% specificity in distinguishing heterozygotes from normal individuals; 4) crucial for reproductive and genetic counseling. If the disease-causing gene is known for a monogenic disease, simply giving the chance of 0.25 for recurrence of an autosomal recessive disease probably cannot satisfy our patients in the post-genomic era. For autosomal dominant disease, the chance of recurrence is 0.5 for a full-penetrant disease and this figure is too high to be accepted by most patients or parents. For clinicians, DNA-based testing of genetic disease can prevent misdiagnosis and increase confidence in diagnosing rare diseases.

14. Amiodarone Induced Thyrototoxicosis is Associated with Adverse Cardiovascular Outcome

Kai-Hang Yiu1, Chung-Wah Sul1, Chi-Ho Lee1, Michelle Yuen2, Maggie Moh1, Yuet-Fung Cheu1, Wai-Luen Le1, Man-Hong Fung2, Katherine Fan3, Hung-Tat Tse2, Wing-Hing Chow2

1Division of Cardiology, Department of Medicine, Queen Mary Hospital, University of Hong Kong. 2Cardiac Medical Unit, Grantham Hospital, Hong Kong

Introduction: Amiodarone induced thyrototoxicosis (AIT) is a common clinical condition which is difficult to manage, however, cardiovascular outcome of these patients comparing to those without AIT is unknown. We sought to determine the major adverse cardiovascular outcome (MACE) in these patients.

Methods: We performed a retrospective review in patients taking amiodarone at a tertiary referral center. Baseline clinical characteristics, laboratory parameters and events during follow up were evaluated. MACE was defined as cardiovascular mortality, myocardial infarction, stroke and ventricular arrhythmias requiring hospitalization.

Results: A total of 354 patients (61.8±14 years; 64.7% male) taking amiodarone for more than 3 months were studied. The most common indication requiring amiodarone was atrial fibrillation (74.8%) followed by ventricular arrhythmia (20.6%). About 35% of patients suffered from underlying ischaemic heart disease. The average dosage of amiodarone was 1735.6±1341.6 mg with daily dosage of 178.0±49.5 mg per day. Fifty-seven patients (13.4%) suffered from AIT and 73 patients (20.6%) had amiodarone induced hypothyroidism (AIH). No differences in baseline characteristics were noted in patients with or without amiodarone induced thyroid dysfunction. Patients were followed up for 48±26.7 months after commencing amiodarone. MACE occurred in 47 patients (13.3%); 18 out of 57 patients (31.6%) with AIT developed MACE which was significantly higher compared to those without (9.8%) AIT (p<0.001). Cox-regression multivariate analysis reviewed in addition to impaired left ventricular ejection fraction (Hazard Ratio [HR] 1.81, CI 1.03–3.09, p=0.03), AIT remained an independent predictor for development of MACE (OR 3.89; CI 2.15–7.06; p<0.01).

Conclusions: Among patients taking amiodarone, the occurrence of AIT is associated with nearly 4 fold higher risk of MACE compared to those without. It is therefore important that clinicians should provide close clinical monitoring in this group of patients.
Abstracts for Free Paper Session:

15. The effect of phallolidin on electrophysiologic changes induced by stretch of infarcted hearts in rats.
FU Lu*, CAO Jun-Xian, XIE Rong-Sheng. Department of cardiology, the First Hospital of Harbin Medical University, Harbin, Heilongjiang province, China.

**Purpose:** To explore whether the stretch of ischemic myocardium could modulate the electrophysiologic characteristics via mechanoelectric feedback (MEF), as well as the effect of phallolidin on the electrophysiologic changes.

**Methods:** 32 Wistar rats were randomly divided into four groups: normal control group (n=9), phallolidin group (n=7), myocardial infarction (MI) group (n=9), MI + phallolidin group (n=7). The acute myocardial infarction was conducted by ligation of the left anterior descending branch (LAD) for 30 min in isolated rat heart. The volume alternation of a water-filled latex balloon in left ventricle produced the stretch of myocardium. After perfused on Langendorff preparation, the isolated hearts were stretched for 5 s by an inflation of 0.1 ml 0.2 ml and 0.3 ml separately. After being stretched, the effect of stretch was observed for 30 s, including LVSP, LVEDP, dp/dtmax, 90% monophasic action potential duration (MAPD90), premature ventricular beats (PVB) and ventricular tachycardia (VT).

**Results:** The stretch caused an increase of MAPD90 in both normal control and MI groups (P < 0.05 or P < 0.01). Moreover, the MAPD90 in the MI group had increased more significantly than that in the control group at the same degree of the stretch (P < 0.01). A concentration of 1 μmol/L phallolidin had no influence on MAPD90 of basal state (both P > 0.05). After stretch, MAPD90 in phallolidin group was slightly increased compared with that in the normal control group (P > 0.05). However, phallolidin reduced the length of MAPD90 in infarcted myocardium, especially at △V=0.3 ml (P < 0.05). The incidence rate of PVB and VT in the MI group was higher than that in the control group (both P < 0.01). And the incidence rate of PVB and VT showed a slightly increase in phallolidin group compared with normal control group (P > 0.05). Phallolidin inhibited the occurrence of PVB and VT in infarcted hearts (both P < 0.01). LVSP and -dp/dtmax in MI group were obviously decreased compared with those in the normal control group (P < 0.01).

With application of phallolidin, LVSP was slightly increased compared with infarcted hearts (P > 0.05), while -dp/dtmax showed a significant increase (P < 0.01).

**Conclusion:** Myocardial infarction could facilitate the generation and maintenance of malignant arrhythmias, while phallolidin could obviously inhibit the occurrence of arrhythmias.
ABSTRACTS

Abstracts for Free Paper Session:

16. Hypertension Control in the Community

ST. A, LAI, Y.H. CHOW, M. CHAN, PT. TSHI.

Kowloon City Community Health Centre, Hong Kong SAR

Background: Hypertension is the most well-known risk factor for cardiovascular disease. Though the methods of detection, monitoring and treatment are available, it is notorious that hypertension is not well controlled.

Method: Community health promotion and screening program were conducted in 16 housing estates in collaboration with the local District Council in 2006-2007. A well-structured questionnaire with demographics, known history and treatment of hypertension, hypercholesterolemia, diabetes mellitus and smoking history were recorded. Body weight, height, blood pressure, spot sugar and cholesterol were taken. Counseling, health talk and distribution of educational pamphlets were given by healthcare personnel supported by volunteers.

Results:

<table>
<thead>
<tr>
<th>Total participants</th>
<th>Number</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male/Female</td>
<td>839471</td>
<td>75%</td>
</tr>
<tr>
<td>Age ≥ 60 years</td>
<td>5489</td>
<td>65%</td>
</tr>
<tr>
<td>History of HT</td>
<td>662</td>
<td>25%</td>
</tr>
<tr>
<td>High blood pressure (≥140/90 mmHg)</td>
<td>987</td>
<td>40%</td>
</tr>
<tr>
<td>Unknown history</td>
<td>426</td>
<td>17%</td>
</tr>
<tr>
<td>Known history</td>
<td>456</td>
<td>20%</td>
</tr>
<tr>
<td>Known history treated</td>
<td>56</td>
<td>2%</td>
</tr>
<tr>
<td>Known history treated</td>
<td>56</td>
<td>2%</td>
</tr>
<tr>
<td>Hypertension off target - Male</td>
<td>96477</td>
<td>54%</td>
</tr>
<tr>
<td>Hypertension - DM (≥140/90 mmHg) - Female</td>
<td>4463</td>
<td>70%</td>
</tr>
</tbody>
</table>

Conclusion: The prevalence of high blood pressure is high. There is room for improvement in detection monitoring and treatment of hypertension for prevention of cardiovascular diseases. The government, physicians and the public should be aware of the unmet treatment targets in hypertension and collaborate to combat this threat to our health.

17. HYPERTENSION AND HYPERLIPIDEMIA

18. The Impact of Adjunctive Dauners-genes Treatment on Endothelial Progenitor Cell Activity in Hypertensive Subjects

TWC Yip CK Wong, PK Chockl, SW Lam, SK Wong, CWR Lam, KP Fung, PC Leung, KSW Liu

Yau Chi Hospital, The Chinese University of Hong Kong, Alice Ho Miu Ling Nethersole Hospital

Introduction: Blood endothelial progenitor cell (EPC) is associated with cardiovascular disease, predictive of cardiovascular morbidity and mortality. Traditional Chinese medicine Danvers and Genes (D&G) can prevent atherosclerosis in hypertensive subjects, but the exact mechanism remains uncertain.

Methods: To evaluate the impact of D&G treatment on peripheral blood EPC, 19 hypertensive patients (16 males) with stable blood pressure control while on standard antihypertensive medications, were randomized to take low D&G (1g/day) dosage, high D&G (2g/day) dosage and image-match placebo for 6 months, in double-blind parallel fashion. Peripheral blood EPC counts were analyzed by flow cytometry, at baseline and at 6 months.

Results: Mean age was 53.27 years. There were no significant changes in their blood pressure and lipid profiles in 3 treatment groups. EPC counts at baseline were significantly higher in low D&G (1g/day) (p=0.05), but were significantly increased after 6 months in both placebo (p<0.01) and high D&G (2g/day) (p<0.02), and not in low D&G (1g/day) treatment.

<table>
<thead>
<tr>
<th>Endothelial Progenitor Cell Counts</th>
<th>Baseline</th>
<th>6 months</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Placenta (n=8)</td>
<td>4.122</td>
<td>18.72</td>
<td>0.01</td>
</tr>
<tr>
<td>D&amp;G (1g/day)</td>
<td>10.925</td>
<td>12.685</td>
<td>0.53</td>
</tr>
<tr>
<td>D&amp;G (2g/day)</td>
<td>3.522</td>
<td>12.857</td>
<td>0.02</td>
</tr>
</tbody>
</table>

Conclusion: Traditional Chinese medicine Danvers-genes adjunctive treatment has no significant effect in blood endothelial progenitor cells in hypertensive subjects. Other mechanisms has to be look to account for its vascular-protective effects.

19. The bioeffective of aggressive statin lipid-lowering therapy in early dialysis nephropathy

TWC Yip, KY Li, AV Leung, CC Seet, MC Chan, PK Chockl, HK Heng, CH Chung, AWH Chan, MKL Tong, KSW Liu

Department of Medicine, Yau Chi Hospital, University Pathology Service Department of Medicine and Therapeutics, Department of Biochemistry, The Chinese University of Hong Kong, Department of Chemical Pathology, Department of Medicine and Geriatrics, Princess Margaret Hospital

Hypertensive-HMGCoA reductase inhibitor, astatin lowers the progression of atherosclerosis of diabetic nephropathy (DN) through its lipid and non-lipid effects.

Methods: 81 patients at their mean age of 38.5 ± 10.7 and 37.6 were randomly assigned to astatin (5 mg daily) or placebo in double-blinded fashion, and were followed up prospectively for lipid profiles and non-lipid factors, including high sensitivity C-Reactive protein (hsCRP), monoclonal cholesterol protein (MCP-1), and tumor necrosis factor alpha (TNF-alfa) for 16 months, in addition to urinary microalbumin excretion up to 24 months.

Results: After 15 months as compared with baseline, there were no significant differences in blood pressure, glycemic control, use of antihypertensive or statin treatment and creatinine therapy.

Hypertension treated group, when compared with placebo group, significantly lowered LDL-cholesterol (1.8 ± 3.5 mmol/L, with p=0.0063), apoB 0.68 ± 0.6 vs 0.62 ± 0.6 with p=0.0053), hsCRP (0.9 ± 1.5 vs 1.1 ± 1.3, with p=0.01) at 6 months and not at 15 months, apo A (1.3 ± 0.4), apo A (0.67) and MCP-1 (p=0.54) on general linear model tested for repeated measures. TNF-alfa in this patient cohort is not elevated.

Conclusion: Astatin reduces inflammatory markers, but has a trend to slowing the urinary microalbumin excretion (p=0.05) in the placebo group.
20.

Cholesterol lowering in Patients who have PCI performed - is the side-effect different among patients with impaired renal function? Man SY, Kong CM, Yip TWC, Yuen CM, Kwong WP, Yan KM, Law TC, Kwan WK, Noo KS. Department of Medicine, Yan Chai Hospital, Hong Kong, China.

Background: Cholesterol lowering treatment either HMGCoA Reductase Inhibitors or statin may have adverse events in renal impaired patients as compared with patients with normal renal function.

Methods: To evaluate the clinical and biochemical outcome during lipid lowering treatment, we analyzed the patients who have percutaneous coronary intervention (PCI) in year 2005 and followed them up to 2006-2007. 143 YCH patients undergoing 171 PCI procedures at PMHI in the year 2005 were included. 3 patients died and 2 patients defaulted follow up in year 2005-2006. The remaining 138 patients were analyzed. The categories of renal function were grouped for comparison: <50 mL/min/1.73 m², 50-75 mL/min/1.73 m² and >75 mL/min/1.73 m².

Results: Most patients received statin dose tolerated at normal dose. However, there are significant changes in lipid levels in patients with impaired renal function. Among the patients with impaired renal function, the LDL-C levels were significantly higher in patients with severe impairment compared to mild impairment.

Baseline renal impairment

<table>
<thead>
<tr>
<th>Category</th>
<th>Severe(n=16)</th>
<th>Moderate(n=60)</th>
<th>Mild(n=60)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baseline LDL-C</td>
<td>4.01 ± 0.1</td>
<td>2.96 ± 0.2</td>
<td>2.58 ± 0.3</td>
</tr>
<tr>
<td>HDL-C</td>
<td>1.04 ± 0.2</td>
<td>1.05 ± 0.1</td>
<td>1.02 ± 0.1</td>
</tr>
<tr>
<td>triglycerides</td>
<td>1.10 ± 0.2</td>
<td>1.05 ± 0.1</td>
<td>1.00 ± 0.1</td>
</tr>
</tbody>
</table>

21.

Common Variants in CETP do not affect HDL-cholesterol levels or the HDL-cholesterol response to rosvastatin.

M. Hu, S. S. Li, R. T. W. Chiu, L. Bauman, B. Tomlinson. Department of Medicine & Therapeutics. The Chinese University of Hong Kong, The Chinese University of Hong Kong, Shatin, Hong Kong.

Introduction: Cholesterol ester transfer protein (CETP) plays an important role in lipid metabolism. Some functional single nucleotide polymorphisms (SNPs) in CETP may modulate serum HDL-cholesterol concentrations and possibly the lipid responses to statins. We investigated whether 2 common SNPs; G279A and C-629A in CETP could influence baseline lipids and responses to rosvastatin in Chinese patients with elevated cholesterol.

Methods: Chinese patients with increased cardiovascular risk and high cholesterol, including those with familial hypercholesterolemia (FH), who had lipid levels available on no treatment and after treatment with rosvastatin 10 mg daily for at least 4 weeks, were selected for the CETP G279A and C-629A polymorphisms.

Results: In 236 patients with self-reported good compliance (113 male; 98 with FH; 87 with diabetes) and mean (+ SD) age 55.6 ± 1.7 years, rosvastatin was well tolerated and mean reduction in LDL-cholesterol was 51.8% and mean increase in HDL-cholesterol was 1.9%. The frequencies of the variant alleles of G279A and C-629A were 41.6% and 48.4%, respectively, and the genotype distribution of each SNP was consistent with Hardy-Weinberg equilibrium. The CETP polymorphisms did not affect the baseline level of HDL-cholesterol and other lipid parameters or the lipid responses to rosvastatin. Patients with FH had higher baseline levels of HDL-cholesterol than those without (1.72 ± 1.1 vs. 1.47 ± 0.4, p = 0.05). Gender did not affect the lipid responses, but patients with lower baseline HDL-cholesterol or without diabetes had greater increases in HDL-cholesterol than those with higher baseline values or with diabetes (p < 0.005).

Conclusion: No significant relationship was found between the polymorphisms examined in CETP and CETP baseline levels or the lipid responses to rosvastatin. Lower baseline HDL-cholesterol levels and not having diabetes were independently associated with greater increases in HDL-cholesterol levels in response to rosvastatin treatment.
ABSTRACTS

Abstracts for Free Paper Session:

HEART FAILURE

23.

Effects of carvedilol on ventricular remodeling in diabetic rats after myocardial infarction
ZHANG Rui-sing, WANG Fei, YU Ping, SHEN Jing-xia, Department of Cardiology, First Hospital of Harbin Medical University, Harbin, China

Purpose: The study was to observe the changes of structure and function of heart in diabetic (DM) rats complicating myocardial infarction (MI), and the effects of carvedilol to them.

Methods: Male wistar rat was fed with diet enriched with sucrose, fat and cholesterol for six weeks, then a small dose of streptozotocin (STZ, 30mg/kg) was injected intraperitoneally to induce type 2 DM. Then MI in rats was made by ligating the left anterior descending coronary artery. Survival rats were randomly divided into three groups: twenty-four hours after operation: placebo (PL), carvedilol (CA). Furthermore, sham operation with diabetes (DS). And rats fed with normal diet were divided into normal rats sham operated (NS) and normal rats with myocardial infarction (NM). Rats in CA group was intragastrically administrated with carvedilol solved in water (10mg/kg d⁻¹) and rats in PL group were infused with parties aequor water. After six weeks, echocardiographic and hemodynamic studies were performed, ventricular weights were weighed.

Results: Six weeks after operation, there were no significant differences in MI size among the three MI groups. Compared with NS and NM group, in PL group, left ventricular end diastolic dimension (LVEDd) and left ventricular weight index (LVWI) were all significantly increased (p<0.01, p<0.05), systolic function was significantly decreased (p<0.01 or p<0.05). Compared with PL, LVEDd and LVWI were significantly decreased (p<0.01) and ventricular dysfunction was significantly improved (p<0.01) in CA group.

Conclusion: The structure and function of heart appeared significant inflout changes in diabetic rats complicating myocardial infarction. And it appeared to be more serious compared to either of the two individual disease alone, however, carvedilol can effectively improve these changes.

24.

CHF-HOME (Congestive Heart Failure - Home, Community, Monitoring and Exercise) Program: Role of Cardiac Nurse in improving the outcome of patients with Congestive Heart Failure
SH Yeung, S F Hui, T F Law, G Y Cheung, K K Ho, Y M Yeung, K K Yuen, K Y Au, K K Chan, K K Lo, Department of Medicine, Pamela Youde Nethersole Eastern Hospital

Introduction: Congestive heart failure (CHF) is a growing public health problem in Hong Kong, it is one of the leading causes of hospitalization in individuals older than 65 years of age. Readmission rate for CHF is very high, with 33% of patients readmitted or died within 60 days. There are numbers of preventable causes of readmission for CHF, including noncompliance with medications or diet, inadequate discharge planning or follow-up, failure to recognize early symptom of disease, and failure to seek medical attention promptly when symptoms recur.

Objective: Through patient education and nursing intervention to improve the clinical outcome of patients with CHF, and reduce hospital admissions and resources utilization.

Method: A multidisciplinary heart failure management team was established in October 2007 to identify, assesses, intervene and monitor selected patients admitted with CHF. Cardiac Nurse will provide pre-discharge education, telephone follow up and enquiry service, which identifies patients with early feature of CHF, check diet and drug compliance, and provides psychological support. Early intervention e.g. medication titration will be offered to patients with early feature of CHF, to prevent further deterioration and unplanned hospital admissions. Level of awareness of heart failure disease was assessed through questionnaires given to patients pre-education and 2 months after initiating CHF program.

Results: A total of 50 patients were enrolled between 3rd October and 28th December 2007. Their mean age was 71.6±4.7 yrs. A total of 264 telephone follow up and 49 telephone enquiry service were provided. 35 episodes of early evidence of CHF were recognized, which were settled without hospital admissions. Drug and dietary advice, awareness of CHF disease and symptoms, importance of home care and self-assessment were reinforced through these services. Level of awareness of heart failure disease was markedly improved in this group of patients.

Conclusion: Cardiac Nurse plays a crucial role in CHF program, which improves the level of awareness of disease, enables identification of patients with early symptom onset and provides timely intervention to prevent the rehospitalization.

25.

CHF-HOME (Congestive Heart Failure - Home, Community, Monitoring and Exercise) Program: Role of Cardiac Nurse in improving the outcome of patients with Congestive Heart Failure
SH Yeung, S F Hui, T F Law, G Y Cheung, K K Ho, Y M Yeung, K K Yuen, K Y Au, K K Chan, K K Lo, Department of Medicine, Pamela Youde Nethersole Eastern Hospital

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Conclusion: Cardiac Nurse plays a crucial role in CHF program, which improves the level of awareness of disease, enables identification of patients with early symptom onset and provides timely intervention to prevent the rehospitalization.

26.

Predictor of Mortality in Heart Failure patients referred for Phase II Cardiac Rehabilitation
RCY Deng, KF Leung, YMW Mak, CS Yue. Division of Cardiology, Department of Medicine and Geriatrics, United Christian Hospital, Hong Kong

Purpose: This was a representative study on heart failure patients referred for phase II (out-patient) cardiac rehabilitation program. Patients admitted for congestive heart failure who had rehabilitation potential were selected by our cardiologists for rehabilitation. The aim of the study was to determine if there was any predictor for mortality after phase II rehabilitation.

Methods: Demographic data were retrieved from our heart failure registry and the clinical records. Patients baseline parameters including age, gender, functional class, causes of heart failure, history of myocardial infarction, ECG pattern (scar formation, QRS pattern, ST change), left ventricular ejection fraction (after phase II rehabilitation), were assessed at the time when they were referred for the program. Survival outcome was retrieved from the computer based clinical record. The cumulative endpoint was determined using the Kaplan-Meier method.

Conclusion: Several factors were further analyzed by using a Cox proportional hazards model.

Results: A total of 200 heart failure patients referred for cardiac rehabilitation between Jan 2005 and Sep 2006 were included. The mean follow up duration was 30±6.0 months. One hundred and three of the patients (51.1%) were males. Thirty (222%) patients had ECG with abnormal intraventricular conduction delay. Sixty-seven (33.5%) patients died at the end of the study. Univariate analysis showed that baseline ECG with intraventricular conduction delay (left bundle branch block or right bundle branch block or intraventricular conduction delay or pacing rhythm) (39.3% vs 12.6%, P<0.05) and a left ventricular ejection fraction of <0.40% (55.6% vs 26.7%, P=0.002) were associated with all-cause mortality. By Cox proportional-hazards regression model, only left ventricular ejection fraction of ≤40% (hazard ratio [HR] 4.0 [95% CI 1.4-10], p=0.005) independently predicted a higher mortality after rehabilitation.

Conclusion: Although ECG with intraventricular conduction delay patients was associated with a higher mortality, only a low ventricular ejection fraction independently predicted a higher mortality in heart failure patients referred for cardiac rehabilitation in our study.
Abstracts for Free Paper Session:

27. Sildénafıl for pulmonary hypertension

Title: Sildénafıl for pulmonary hypertension

Dr ML Ma, Dr CY Wang, Dr Boves CW Cheng, Dr Minnoi Ky Lee, Dr KT Chan, Dr MH Laiung, Dr SY Chan, Dr TY Lee, Dr NL Ho, Dr CL Chuang, Department of Medicine, Queen Elizabeth Hospital

Purpose: To evaluate the clinical efficacy of sildénafıl in pulmonary hypertension patients in QEHHK COLLEGE OF CARDIOLOGY, SIXTEENTH ANNUAL SCIENTIFIC CONGRESS

Methods: Patients, who were labeled as primary pulmonary hypertension, were searched through the clinical data analysis and report system (CDARS) in our hospital from Jan, 2005 to June, 2007. Those who were taking sildénafıl were recruited for analysis.

Results: During the study period, 39 patients were diagnosed to have pulmonary hypertension. Of them, 4 were having idiopathic pulmonary arterial hypertension (IPAH) & 8 were having pulmonary hypertension secondary to connective tissue disease (CTD). The male to female ratio was 3:7 with a mean age of 43.1 years old (10-79). Echocardiograms were performed in all patients and the mean TVPG before and after sildénafıl treatment were 84.1 mmHg and 85.4 mmHg respectively. Mean pulmonary arterial pressure was 58.1 mmHg. 6-minute-walk showed that there was an average increase in 81m. after 4-6 months of sildénafıl treatment.

Conclusions: After sildénafıl treatment, there was both subjective and objective improvement in exercise tolerance and symptoms.

28. Reverse Remodeling in Heart Failure Patients Received Cardiac Contractility Modulation Therapy

Chin-Peng Chan, Joseph Yat-Sun Chan, Qing Zhang, Anna Kin-Yin Chan, Chun-Yan Ma, Jeffrey Wing-Hong Fung, Cheuk-Man Yu, Division of Cardiology, Department of Medicine and Therapeutics, Institute of Vascular Medicine, The Chinese University of Hong Kong

Purpose: Cardiac Contractility Modulation (CCM) is a new form of device based therapy for advance heart failure patient even with normal QRS width and therefore not a candidate for cardiac resynchronization therapy. Previous studies showed that CCM improved left ventricular (LV) ejection fraction (EF) and clinical parameters of heart failure patients. However, data from comprehensive echocardiographic assessment and structural reverse remodeling is lacking.

Methods: 26 patients (mean age: 58.69±10.46 years, 21 males) with NYHA class III heart failure, QRS <120msec and already on optimal medical therapy received CCM. Real-time 3D echocardiography (RT3DE) (IE33,Philips) and tissue Doppler imaging (TDI) (Vivid 7,GE) were performed at baseline and 3 months after CCM.

Results: LV reverse remodeling with reduction in volumes and gain in EF was observed by RT3DE at 3 months. TDI also showed improvement of regional systolic function resulting in an increase in peak systolic velocity by measuring 12 (Mean Sm-12) or 6 basal (Mean Sm-6) LV segments (Table).

Conclusions: CCM improves both global and regional LV contractility leading to LV reverse remodeling.

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Baseline</th>
<th>3 months</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>EF, %</td>
<td>28.1±6.3</td>
<td>33.4±6.1</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>LV end-systolic volume, ml</td>
<td>113.3±35.3</td>
<td>99±35.1</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>LV end-diastolic volume, ml</td>
<td>156.2±40.5</td>
<td>146.5±40.6</td>
<td>0.003</td>
</tr>
<tr>
<td>Mean Sm-12, cm/sec</td>
<td>2.5±0.6</td>
<td>2.5±0.7</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Mean Sm-6, cm/sec</td>
<td>2.3±0.6</td>
<td>2.9±0.7</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Myocardial performance index</td>
<td>0.76±0.25</td>
<td>0.62±0.17</td>
<td>0.002</td>
</tr>
</tbody>
</table>

J HK Coll Cardiol, Vol 16 April 2008 19
ABSTRACTS

Abstracts for Free Paper Session:

PERCUTANEOUS CORONARY INTERVENTION

29.

Gender and Atherosclerotic Plaque Composition: Insights from Virtual Histology.
MKY Lee, WKT Huy, KT Chan, D Ho, CW Chung, CT Fu, MC Chan, CS Chang
Division of Cardiology, Queen Elizabeth Hospital, Hong Kong.
*Department of Physiology, Institute of Cardiovascular Research and Medicine,
The University of Hong Kong, Hong Kong.

Purpose: When compared to men, women with coronary artery disease have a higher risk for adverse outcomes after conventional coronary interventions. This suggests that gender differences in cardiovascular disease may differ according to the plaque morphology. The purpose of this study was to use Virtual Histology (VH-VIVUS) to investigate whether there are sex-based differences in plaque composition of a culprit lesion in a left anterior descending artery (LAD).

Methods: Patients who had angiographically visible LAD lesions were selected for assessment with a commercially available VH-VIVUS console (Volcano Corp.). VH-VIVUS allows reliable characterization of atherosclerotic plaques into four different types: fibrous, fibrofatty, dense calcium and necrotic core. All VH-VIVUS studies were performed using a 20MHz solid-state catherer (EagleEye, Volcano Corp.) with an automated pullback speed of 1.0 mm/s. VIVUS frames with the largest plaque burden from each culprit lesion were grabbed for analysis. Differences in means between the groups were analyzed by the two-sample t test. All values were expressed as mean ± SD, and p values < 0.05 were considered significant.

Results: Twenty-two patients were enrolled in the study (Mean age 66.25 ± 8.67 years; 12:10 men:12:1 with diabetes). Overall relative findings and plaque composition are presented below:

<table>
<thead>
<tr>
<th>Male</th>
<th>Female</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>65.67 ± 8.58</td>
<td>70.12 ± 7.24</td>
</tr>
<tr>
<td>Lumen Diameter (mm)</td>
<td>7.26 ± 0.25</td>
<td>7.28 ± 0.26</td>
</tr>
<tr>
<td>Lumen Area (mm²)</td>
<td>40.82 ± 0.96</td>
<td>42.34 ± 1.53</td>
</tr>
<tr>
<td>Vessel Diameter (mm)</td>
<td>4.52 ± 0.29</td>
<td>4.18 ± 0.64</td>
</tr>
<tr>
<td>Vessel Area (mm²)</td>
<td>16.92 ± 2.67</td>
<td>14.26 ± 3.13</td>
</tr>
<tr>
<td>% Plaque Burden</td>
<td>74.29 ± 6.73</td>
<td>64.18 ± 11.75</td>
</tr>
<tr>
<td>% Fibers</td>
<td>66.64 ± 1.64</td>
<td>50.36 ± 34.52</td>
</tr>
<tr>
<td>% Fibrous</td>
<td>3.44 ± 2.31</td>
<td>4 ± 6.9</td>
</tr>
<tr>
<td>% Calcium</td>
<td>15.89 ± 7.53</td>
<td>11.3 ± 11.91</td>
</tr>
<tr>
<td>% Vascularized Core</td>
<td>19.78 ± 14.72</td>
<td>24.21 ± 37.68</td>
</tr>
</tbody>
</table>

Conclusions: Men were younger with a larger reference vessel size and plaque burden compared to women. On the other hand, women had lesser fibrous tissue and more necrotic core in their plaque content suggesting women with coronary artery disease to have a substantially higher risk of clinical events than men.

30.

Virtual Histology by Intravascular Ultrasound Study on Degenerative Aortocoronary Saphenous Vein Grafts
MH Jim, WK Hsu, RL Ko, CW Shiu, IHI Ho, HK Yiu, WH Chew
Grantham Hospital & Queen Mary Hospital

Purpose: Virtual histology (VH–intravascular ultrasound (IVUS)) provides a real-time, panoramic assessment of plaque composition which determines the clinical presentations and behaviors during coronary intervention. However, data on aortoarterial saphenous vein grafts (SVG) is lacking. This study sought to report the VH-VIVUS findings in degenerative aortocoronary SVG lesions and correlate various types of plaque (fibrous, fibro-fatty, dense calcium, and necrotic core) with different clinical and lesion characteristics.

Methods: VH-VIVUS was performed on SVG in 38 symptomatic patients with history of coronary artery bypass grafting, who underwent percutaneous coronary intervention on native vessels or SVG. Measurements were made at the image slice with the smallest lumen.

Results: A total of 54 SVG lesions were analyzed, the mean graft age was 13 ± 4 years. The mean vessel size was 5.9 ± 1.0mm, plaque area was 13 ± 7 mm², and plaque burden was 60.2 ± 15.8%. Fibrous tissue represented the major plaque component (62.1 ± 17.1%). More calcium deposition was detected at the site of maximal disease in diabetic patients (13.9 ± 12.7% vs 7 ± 10.2%, p = 0.048). Thrombus-containing lesions and lesions with a plaque burden of > 70%, which represented unstable plaques, were associated with larger vessel size, higher % of fibro-fatty tissue but lower % of dense calcium. Plaque burden was found positively correlated with the amount of fibro-fatty tissue (T = 0.49, P = 0.001) but negatively correlated with % of dense calcium (T = -0.31, P = 0.03).

Conclusion: The severity of SVG atherosclerosis paralleled with a proportional increase in fibro-fatty tissue. Unstable plaques in SVG were associated with positive remodeling, lipid-rich atheroma, and less calcium deposition, similar to the VH-VIVUS findings in native coronary arteries.

31.

Late outcome of Bare metal versus Drug eluted Stenting in Primary percutaneous coronary intervention for ST segment elevation myocardial infarction
KCG Chan, MKY Lee, LC Chan, CY Wong, HS Ma, LV Tam, CL Fu, CW Cheung, CW Chung, HK Lee, KT Chan, KC Ho, CC Cheung, Department of Medicine, Queen Elizabeth Hospital, Hong Kong.

Purpose: Primary percutaneous coronary intervention (PCI) has proven to be effective in acute treatment of ST segment elevation myocardial infarction. Short term outcome data are available showing that drug eluted stent (DES) is safe in this clinical setting. We evaluated the late outcome of the use of DES in a local regional hospital in Hong Kong.

Methods: We retrospectively analysed 146 patients admitted to our medical unit for ST elevation myocardial infarction who were treated with primary PCI with clinical follow up longer than one year after the index procedure. Baseline characteristics, procedural details, late outcome were recorded and were compared between both bare metal stent (BMS) and drug eluted stent group.

Results: The baseline characteristics, including age, sex, presence of diabetes, hypertension, hyperlipidaemia, smoking status, use of thienopyridine, dual protection device, direct stenting, length and size of stent, number of stents used were all similar between the two stent groups. More glycoprotein IIb/IIIa inhibitors were used in DES group (68% in DES vs 30% in BMS, p=0.012). There were 52 patients (70.3%) and 22 patients (29.7%) were treated with BMS and DES respectively. Mean follow up duration was 832 days. There was no event of definite stent thrombosis. There was one event of possible late stent thrombosis in the bare metal stent group. There were 6 cases of target vessel revascularisations (TVR; 6.9% in BMS group and 4.9% in DES group; p=0.556). There were 5 deaths during the follow up period (5.6% in BMS and 1.4% in DES; p=0.687).Older age (74 vs 61; p=0.029), longer stent length (Mean vs Mean, p=0.022) and greater number of stents (1.64 vs 2.80; p=0.015) are associated with higher late mortality.

Conclusions: DES is safer and not associated with increased mortality as compared to BMS in primary PCI for ST elevation myocardial infarction in an average of 2.6 years of follow up. No definite late or very late stent thrombosis occur in both groups. It shows a trend towards reduce TVR and mortality. Older age, long stent and greater number of stents predict higher mortality for patient undergoing primary PCI.

32.

Paclitaxel-Eluting Stent: Long Term Outcome in Percutaneous Saphenous Vein Graft Intervention (PELOPS) Study
Ho HH, Ko RL, Chow WH, Jim MH
Cardiac Medical Unit, Grantham Hospital, Hong Kong.

Objective: The role of drug-eluting stent in the treatment of saphenous vein graft (SVG) disease is not well defined. The aim of this study was to examine the long term clinical and angiographic outcomes of paclitaxel-eluting stent (PES) in percutaneous SVG intervention.

Method: From January 2004 to September 2007, 70 consecutive patients with 97 SVG lesions were treated with PES. Patients were followed-up regularly at 1.3 and 9 months. Angiographic follow-up was performed at 9 months.

Results: The mean age of patients was 71 years old male predominance(73%). The mean age of the SVG was 13 ± 4 years. Diabetes mellitus was present in 35(50%) of patients. Embolic protection devices were used in 53(55%), and glycoprotein IIb/IIIa inhibitors was given in 25(26%) of lesions. The majority were body lesions(87%). On average 1.5 stents was implanted per lesion, the mean stent size was 3.4 ± 0.2 mm and stent length was 40 ± 32 mm. Four patients developed cardiac enzyme rise post procedure. In hospital major adverse cardiovascular events(MACE) which was defined by death, non-fatal myocardial infarction(3MII) and target vessel revascularisation was 6%. Nine-month clinical follow-up was performed on 59 patients, the MACE was 15%(death,0; NFMII,0; TVR,9). Restudy angiography was performed on 62 lesions. The overall binary restenosis rate was 14.5%(9 lesions).

Conclusion: PES is very effective and safe in the treatment of SVG lesions compared with historical control using bare metal stents.
ABSTRACTS

Abstracts for Free Paper Session:

33. The e-HEALING Registry at Queen Mary Hospital – Results from 1-year follow-up
Dr. Kelvin Kw Chan, Dr. Michael PH Chan, Dr. Simon CC Lam & Dr. Jojo SH Ha, Dr. Linda Lam, Dr. Raymond Chan, Dr. Stephen WL Lee, Division of Cardiology, Dept of Medicine, Queen Mary Hospital

Purpose
The purpose of this Registry is to ascertain the clinical safety and efficacy of the anti-CD34 antibody coated, Endothelial Progenitor Cell (EPC) capturing, bio-engineered GENIUS® Stent for patients undergoing elective percutaneous coronary intervention (PCI) in Queen Mary Hospital

Methods
All results collected were based on reporting from Queen Mary Hospital as part of the international e-HEALING Registry. Patient demographics, lesion characteristics, patients' follow-up and outcomes, e.g. major adverse cardiac events (MACE), bleeding, etc. at 12 months were analysed. All results were non-adjudicated and non-core lab QCA data.

Results
30 patients were enrolled in QMH e-HEALING Registry, with average age of 65.1 years, 72% were male, 34% had diabetes mellitus & 38% with history of previous PCI. All patients were on aspirin plus 1-month duration of clopidogrel 75mg daily after 300mg loading dose for PCI. 94.9% were de novo lesions while 5.1% were restenotic lesions. Average lesion length was 21.1 ± 7.6 mm and the reference vessel diameter was 29 ± 0.4 mm. Number of lesions per patient was 1.6 with majority Type B lesions (B1 29.1% & B2 40.5%) and number of stents per patient was 1.9. At 12 months, there was 1 case of unrelated death (2%) and no case of myocardial infarction, CABG or stent thrombosis (0%). Concerning target vessel failure (TVF), there were total of 4 patients (8%). 11 patients (22%) experienced other serious adverse events but there was no case of bleeding or vascular complication (0%). The overall MACE was 8% and was driven totally by the 8% TVF rate.

Conclusion
The EPC-capturing, bio-engineered GENIUS® Stent showed excellent results in primary success, MACE and stent restenosis rate, through the concept of accelerated endothelial healing and establishment of functional endothelium.

34. 9-Months Clinical and Angiographic Outcomes of Coronary Bifurcation Lesions Treated with the ‘Sleeve Technique’
Ryan L-Y Ko, H-H Ho, W-H Chew, M-H Jim Cardiac Medical Unit, Grantham Hospital

Purpose: Different stenting techniques for coronary bifurcation lesions have been developed with varying degree of procedural complexity and side branch coverage. 'Sleeve Technique' is a modified version of the well-published 'Crush Technique'. It was developed to reduce procedural complexity by facilitating side branch access and improving the rate of final 'Kissing-balloon inflation'. We report the long term clinical and angiographic outcome of patients treated with the ‘Sleeve Technique’.

Method: From July 2005 to June 2006, 34 symptomatic patients with non-left main coronary bifurcation lesions requiring a 2-stent strategy were treated with Drug-Eluting stents using the ‘Sleeve Technique’. These patients were followed up prospectively with 9-months follow-up data and re-study angiogram completed in 30 (88%) patients.

Results: The mean age of the cohort were 66 ±12 years with 37% suffering from Diabetes Mellitus. 77% of the lesions involved a Left anterior descending artery (LAD) and a Diagonal branch bifurcation. Final ‘Kissing-balloon inflation’ was successful in 100% of the cohort. Cumulative Device-oriented MACF at 9 months was 13.3% with 1 patient suffering from an acute stent thrombosis while in-hospital. Binary restenosis rate of the main vessel and the side branch was 6.9% and 3.5% respectively giving an overall target lesion revascularization (TLR) rate of 10.0% at 9 months.

Conclusion: ‘Sleeve Technique’ for bifurcation stenting with Drug-Eluting stents is associated with favorable long-term outcomes. The 9-months TLR rates are comparable with those published results achieved with the ‘Crush Technique’. Procedural success and side branch luminal patency was greatly enhanced by the 100% achievement of Final ‘Kissing-balloon inflation’; a critical part of the ‘Crush Technique’ that significantly reduces side branch late lumen loss.

35. Safety of clopidogrel standalone therapy in patients implanted with drug-eluting stents
PT Tsai, CW Wu, NS Mok, NY Chan, CL Lau, YK Lo, WS Leung, ST Lau Department of Medicine and Geriatrics, Princess Margaret Hospital, HK SAR

Methodology: Dual antiplatelet therapy is essential to prevent stent thrombosis in patients implanted with drug-eluting stents (DES). However, some patients may not tolerate aspirin because of drug allergy or gastrointestinal (GI) side effects. This is a retrospective observational cohort study on safety of clopidogrel standalone therapy in 42 consecutive patients implanted with DES at cardiac intervention centre of Princess Margaret Hospital. Define stent thrombosis is defined as angiographic confirmation of stent thrombosis. Probable stent thrombosis is defined as target vessel myocardial infarction without angiographic confirmation or unexplained death within 30 days. Possible stent thrombosis is defined as unexplained death after 30 days.

Results: 31 males and 11 females of age ranged from 40 to 88 (mean±SD=64±12) were followed up for 3 to 44 months (mean±SD=20±14) after percutaneous coronary intervention. Cardiovascular risk profile was as follows: diabetes (38%), smoking (50%), hyperlipidaemia (62%). Reasons of aspirin intolerance were: allergy (15), GI bleeding (13), GI ulcer or pain (11) and unknown (2). Among the 25 patients with GI intolerance, none of them developed clinical GI bleeding (15 on proton pump inhibitor 6 on H2 blocker), 93 DES (56 paclitaxel, 23 sirolimus, 10 zotarolimus, 4 everolimus) were implanted in LAD (41), LCX (27) and RCA (25). The average number and length of stent per patient was 2.2 and 23 mm respectively. 43 (46%) stents implanted were less than 3.0 mm in diameter. There was no definite, probable or possible stent thrombosis (acute, subacute or late) in this cohort. One patient died of bowel perforation.

Conclusion: Clopidogrel standalone therapy appeared safe in patients with aspirin intolerance and DES implanted. Concurrent proton pump inhibitor or H2 blocker might prevent clinical GI bleeding.

36. Experience with Tornus® in balloon-uncrossable coronary lesions
CK Chan, JWong, XF Leung, D Lo, LL Cheung, TS Chong, R Fung, CS Yuen Division of Cardiology, United Christian Hospital, HK SAR

Background and Objective: Fibrocalcific coronary lesions occasionally cannot not be crossed even with the lowest profile balloons. Among other techniques or devices, Tornus®, Asahi Intecc Co Ltd (2.1 Fr) may help drill a lumen to facilitate balloon passage. Experience with the use of this device is reviewed on its safety and efficacy.

Method and Results: All percutaneous coronary intervention (PCI) procedures (n=299) were analyzed from PCI reports during the period from Jun 07 to Jun 08. Tornus® was required in 2.3% (n=7). Demographics and cine-angiograms of these seven patients were analyzed. All were males with mean age of 74±8 years. Arterial access was femoral in 3 patients and radial in 4. All 7 cases involved the right coronary artery (RCA). Angiographically, moderate amount of calcium was present along the lesions but there was no excessive tortuosity of the artery. Two lesions were genuine chronic total occlusion and the rest were subtotal occlusions. Tornus® was used after the lowest profile balloons (1.25mm or 1.5 mm monorail/over-the-wire) failed to cross the lesions. Five cases could be successfully crossed with Tornus® and then balloon-dilated and stented. 2 cases remained uncrossable with Tornus® and procedures had to be adjourned. There were no complications associated with the use of Tornus® viz. uncoiling, breaking or entrapment within the lesion.

Conclusions: Balloon uncrossable lesions are infrequently encountered and usually occur along the RCA in our cohort of patients. Use of Tornus® catheter appears safe in our study and can be considered in selective cases to improve the success rate of the procedures.
ABSTRACTS

Abstracts for Free Paper Session:

37. 

Renal Outcome in Patients who Have PCI Performed – is the renal deterioration transient?
Yip TW, Man SY, Kong CM, Tam KM, Law TC, Yuen CM, Kwong NP, Kwan WK, Woo KS.
Department of Medicine, Yan Chai Hospital, HK SAR, China

Background: During the first year follow-up in 2008, there was significant proportion of patient with normal to moderate renal impairment having renal deterioration after PCI. To answer the question, we look into the database again in 2007.

Methods: To evaluate the renal outcome after percutaneous coronary intervention (PCI), 143 YCH patients undergoing 173 PCI procedures at PMRI in the year 2005 were studied. 4 patients died and 2 patients defaulted follow up in year 2005-2006. The remaining 136 patients were analysed.

3 categories of renal function were grouped for comparison - <50, 50-75, >75 ml/min/1.73m². Drop in renal function was defined by the reduction of 10 ml/min/1.73m².

Results: Renal function deterioration is still noted among patients at moderate to normal groups.

<table>
<thead>
<tr>
<th>Baseline renal impairment</th>
<th>Moderate to</th>
<th>Mild to Moderate</th>
<th>Mild to</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ccr(ml/min/1.73m²)</td>
<td>Severe(n=16)</td>
<td>(n=56)</td>
<td>Normal(n=64)</td>
</tr>
<tr>
<td>Baseline Ccr</td>
<td>40.4±9.4</td>
<td>64.1±6.5</td>
<td>89.5±13.6</td>
</tr>
<tr>
<td>Age (years)</td>
<td>69±12.8</td>
<td>68±13.8</td>
<td>60±26.8 **</td>
</tr>
<tr>
<td>Sex (male)</td>
<td>83(50%)*</td>
<td>37(66.1%)</td>
<td>48(75.0%)</td>
</tr>
<tr>
<td>DM (%)</td>
<td>7(43.8)</td>
<td>28(66.4)</td>
<td>27(42.2)</td>
</tr>
<tr>
<td>HT (%)</td>
<td>10(62.5)</td>
<td>32(57.1)</td>
<td>32(50.0)</td>
</tr>
<tr>
<td>Ex./Smoker (%)</td>
<td>2(50)</td>
<td>27(48.2)</td>
<td>27(42.2)</td>
</tr>
<tr>
<td>TC (mmol/l)</td>
<td>4.1±1.6</td>
<td>4.1±1.08</td>
<td>4.1±1.08</td>
</tr>
<tr>
<td>TG (mmol/l)</td>
<td>1.3±0.69</td>
<td>1.2±0.56</td>
<td>1.2±0.56</td>
</tr>
<tr>
<td>LDL-C (mmol/l)</td>
<td>2.4±0.55</td>
<td>2.4±0.73</td>
<td>2.4±0.73</td>
</tr>
<tr>
<td>HDL-C (mmol/l)</td>
<td>1.0±0.23**</td>
<td>1.3±0.26</td>
<td>1.4±0.34</td>
</tr>
<tr>
<td>Cardiac event</td>
<td>187(49)**</td>
<td>152±62</td>
<td>160±62</td>
</tr>
<tr>
<td>Drop after procedure (%)</td>
<td>(18.8)</td>
<td>10(17.9)</td>
<td>29(45.3)**</td>
</tr>
<tr>
<td>Drop after 1 year(%)</td>
<td>3(6.3)</td>
<td>14(25)**</td>
<td>20(31.3)**</td>
</tr>
<tr>
<td>Drop after 2 year(%)</td>
<td>6(3)</td>
<td>12(21.4)**</td>
<td>20(31.3)**</td>
</tr>
<tr>
<td>After procedure Ccr/Cc</td>
<td>36.6±7.9</td>
<td>60.8±10.2</td>
<td>80.4±13.0</td>
</tr>
<tr>
<td>After 1 year Ccr/Cc</td>
<td>39.4±9.3</td>
<td>61.3±10.8</td>
<td>83.1±14.7</td>
</tr>
<tr>
<td>After 2 year Ccr/Cc</td>
<td>39.3±10.1</td>
<td>62.3±12.5</td>
<td>84.3±14.5</td>
</tr>
<tr>
<td>MACE(2 year)</td>
<td>1(6.3%)</td>
<td>5(8.9%)</td>
<td>8(12.5%)</td>
</tr>
</tbody>
</table>

* p<0.01, ** p<0.001 as compared with the other group(s).

Conclusion: The renal deterioration noted in the first year after PCI is mostly not transient.

38. 

Clinical Characteristics and Outcome in Octogenarians Undergoing Percutaneous Coronary Intervention in a Regional Hospital

David KY Lo, John Wong, CK Chan, RF Leung, CS Yue. Division of Cardiology, United Christian Hospital, Hong Kong SAR, China

Purpose: Data concerning percutaneous coronary intervention (PCI) in octogenarians (patients aged 80 – 89 years) are scarce. The objective of this study was to evaluate the clinical characteristics and outcome of octogenarians undergoing PCI in a regional hospital.

Method: We performed a retrospective analysis using our PCI database. We included all consecutive patients aged 80 to 89 years undergoing PCI between April 2006 and July 2007 in our hospital. Their clinical characteristics, procedural data, one-month and six-month clinical outcomes were obtained and analyzed.

Results: 30 patients were identified with a mean age of 82.5 years and most of them were male (73%). This group of patient contributed to 3.7% of total number of PCI performed at that period. 53% presented with Canadian Cardiovascular Society (CCS) Class III stable angina, 47% were admitted with acute coronary syndrome (ACS). Most of the patients had cardiovascular risk factors including smoking (47%), hypertension (80%), diabetes mellitus (47%) and hyperlipidaemia (50%). Renal failure (3%) and heart failure (7%) were not common in our study population. Coronary angiography documented single vessel disease in 53% of patients with most of them having complex lesions (type B or C in 97% of cases). In 10% of cases intra-aortic balloon pump (IABP) were used and overall procedural success was achieved in 96% of cases. There were no major adverse cardiac events including death, myocardial infarction (MI), urgent revascularization and stroke at hospital discharge and one-month after PCI. By 6-months, 1 patient died of recurrent MI and another patient died of stroke. 2 more patients suffered MI. The remaining patients reported improvement in angina symptoms (77% in CCS class I, 23% in class II and no patients in class III or IV).

Conclusion: In our study, well-selected octogenarian patients undergoing PCI appear to benefit from PCI with reasonable short-term outcome and improvement in symptoms.
VALVULAR HEART DISEASE

40.

Local experiences of infective endocarditis in Hong Kong

YH Cheng, MKY Lee, SF Chui, KC Chan, HK Chan, CY Wong, HS Ma, LY Yam, CL Fu, CW Chan, CW Cheng, D Ho, KT Chan, KC Ho, CS Chiang. Division of Cardiology, Department of Medicine, Queen Elizabeth Hospital, Hong Kong

Objective: To describe the epidemiological, microbiological and outcome characteristics of infective endocarditis (IE) in a tertiary medical centre in Hong Kong.

Methods: This is a descriptive retrospective study of consecutive patients treated for IE at the Queen Elizabeth Hospital, Hong Kong in the year 2007. Patients with a diagnosis of IE, that were admitted between 1st January and 31st December 2007, were identified using the Clinical Data Analysis & Reporting System (CDARS). Each individual case histories were then reviewed and using the Clinical Management System (CMS).

Results: Thirty-eight cases of IE (24 males, 14 females; mean age: 52, median age: 50.5, range 19-83; in year 2007) were reviewed. Nine patients (23.7%) were intravenous drug abusers. The most common predisposing heart disease was rheumatic valvular disease (34.2%). Seven patients (18.4%) had previous IE. Prosthetic valve endocarditis (PVE) accounted for 15.8% of cases. The average length of stay was 22 days (median 16.5; range 1-66 days). Causative microorganisms were identified in 75.6% of cases: streptococci (38.8%), staphylococci (31.6%) and enterococci (9.9%). Blood cultures were negative in 23.7%. Significant morbidity developed in 23 patients (63.8%). The most frequent complications were heart failure (44.7%) and embolic event (34.2%; cerebral 18.4%, pulmonary 15.8%). Cardiac surgery was performed in 11 cases (29%). The in-hospital mortality was 23.7%.

Conclusions: The local data from the present study were comparable to international data. None of the cases in this study had recent dental procedure. Even though uncommon, IE remains a disease with a considerable mortality and complications rate. Early detection and the use of appropriate antibiotics could improve its outcome.

41.

The Changing Pattern of Infective Endocarditis Over the Past Decade

KC, Keg, WK, Lai, Sine M, L, Chow, KY, Tse, CS, Lam, PW, Yam, WK, Chan, MK, Wong, YH, Chan, WL, Long, KL, Chau, NL, Lam. Department of Medicine & Geriatrics, Tuen Mun Hospital, Hong Kong

Background: Infective endocarditis (IE) is an important disease entity leading to significant cardiac morbidity and mortality. It is important to understand the factors for the increased prevalence and the change in the disease pattern of IE in the recent ten years.

Purpose: The objective of this study is to compare the characteristics of patients suffering from IE in 2007 with those 10 years ago.

Methods: Analysis was made from data collected in computer medical records at Tuen Mun Hospital, involving patients with a diagnosis of IE according to the modified Duke’s criteria in year 1998 and year 2007. Data were grouped into different categories including demographics, co-morbidities, causative organisms, and complications.

Results: The number of patients affected by IE in 1998 and 2007 were 11 and 34 with a male to female ratio of 5:4 and 10:26 respectively. The mean ages were 61.4±16.16 years and 54.6±18.9 years (p=0.32). There was no significant difference in Hospital stay (p=0.09). There was an impressive, yet increasing trend towards more patients requiring surgical referral (p=0.09), and no significant difference yet slightly increased trend observed in mortality (p=0.09). Different categories are compared and shown in the following tables:

Conclusions: The number of patients affected by IE has increased over the last decade along with more diversity and more complications. While in-surgery and in-line septum were the two main complications in 1998, the complications identified in 2007 had become more diversified. There were more coexisting conditions of patients, more diverse complications and a higher rate of surgical referrals. The duration of hospitalization remained the same but morbid. The changing eighteen years, however, more data collection is necessary in order to attain a larger sample size for more accurate reflection of the prudential trend of IE in Hong Kong.
ABSTRACTS

Abstracts for Free Paper Session:

CARDIAC IMAGING

42. Opening Area of Mitral Valve Measurement: Initial Clinic Application with Measurement Software (VolEdit.ext.0.0.1)
Yao Liping, Sun Kun, Yang Xin, Zhu Lei, Zhang Yuqi, Wu Lianping
Department of Pediatric Cardiology, Shanghai Children’s Medical Center affiliated to Shanghai Jiaotong University, Shanghai 200127, China

Purpose: Mitral apparatus is the most complex and subtle construction of heart. How to quantitate and evaluate the mitral apparatus is difficult. On the base of real-time three-dimensional echocardiography, we analyzed the opening mechanism of the normal mitral valve and the pathologic valve used the tritus software designed independently, to aim at the clinic validation of the software.

Methods: In consecutive patients with moderate mitral regurgitation and normal, real-time 3-dimensional echocardiography were performed. All the picture were imported to the station on the platform on Matlab 7.0.0.19920 (R14) and transformed from the Dicom form to the Bmp form. The opening area valve with non-machine recirculation form in one cardiac cycle was measured by the software (VolEdit.ext.0.0.1) and the result was registered. Area curve was generated in each case. The following parameters were calculated and conserved by computer automatically: (1) the time of affection point (G point) – the point with the largest slope rate, (2) Int1 – the interval from G point to peak value, (3) Int2 – the interval from peak value to valve closure, (4) Int3 – the interval of valve opening Int3 = Int1 + Int2, (5) a value – the largest slope rate of the valve opening. Statistical analysis was performed by SPSS10.0.

Results: On the diagram of area curve, control group showed a symmetric singlet picture. The ascending slope rate and descending slope rate were similar. After 0.8 cardiac cycle, the curve returned to baseline level. However, in the experimental group, it showed a disymmetric singlet picture. The ascending slope rate was less than the descending slope rate. The curve returned to baseline level after 0.9 cardiac cycle. Statistical analysis showed no significant difference of G point and Int2 time (P>0.05) but significant difference of Int1, Int3 time and a value (P<0.05).

Conclusion: VolEdit.ext.0.0.1 could demonstrated the mitral valve motion very well. In diastolic phase, the acceleration of mitral valve of the control group is bigger than that of the experimental group. The normal mitral valve opening time is 0.4 cardiac cycle, while the pathological valve is 0.6 cardiac cycle. The initial application of this software showed it potential clinic value in mitral opening area measurement.

44. Can Cardiot Intima-Media Thickness predict Cardiovascular events?
Simon CC Lam, Shun-Ling Kong, Jo Jo SH Hai, Michael PH Chan, Kelvin KW Chan, Raymond HW Chan, Stephen WL Lee, Division of Cardiology, Dept of Medicine, Queen Mary Hospital

Purpose: The purpose of this study was to investigate whether ultrasound measurement of carotid intima media thickness (IMT) can predict cardiovascular events in our population.

Methods: 136 consecutive Chinese subjects planned for coronary angiography for suspected new episode or recurrent Ischaemic Heart Disease were enrolled. The ultrasound measurements were obtained on the morning of coronary angiography. IMT at the bulb, internal and common carotid artery were documented separately and their mean was calculated. Subjects were then followed up until 1. primary composites end point of cardiovascular events 2. death 3. termination date of Jan, 24. 2008. The incidence of cardiovascular events was captured by screening through clinical medical database from Hospital Authority. The study was approved by the Institutional Review Board of the University of Hong Kong.

Results: The mean follow up days was 577±173days. For these intermediate risk subjects, twenty subjects (14.71%) developed the primary composite end point. These events included unstable angina, acute coronary syndrome, heart failure, cardiovascular accident, arrhythmia, peripheral vascular disease, and sudden cardiac death. Cox Regression models with PROC PHREG was used for the survival analysis. We found that overall carotid mean IMT, either left or right alone or even both, was not a strong predictor of cardiovascular disease in this group of subjects. Our results indicated that IMT at Left bulb site was a strong predictor of cardiovascular events with p value =0.019. The hazard ratio for Left bulb IMT was 1.051. This implied for each 0.1 mm increase in Left IMT, the hazard of cardiovascular events would go up by an estimated 5.1%.

Conclusion: Carotid IMT at bulb site was a strong predictor of cardiovascular event and it may be useful for risk stratification in this group of patients. Carotid Doppler ultrasound was a valuable tool for assessing the cardiovascular risk in intermediate risk subjects.

43. Diagnosis of idiopathic pericarditis in constrictive pericarditis by quantitative tissue Doppler imaging
Yin-Fang Wang, MD, Xiao-Fang Lu, MD, Ming-Xing Xie, MD, Qing Lai, MD
Department of Echocardiography, Union Hospital, Tongji Medical College, Huazhong University of Science and Technology, Wuhan 430022, People’s Republic of China

Objectives: To observe the motion of pericardium and myocardium in patients with constrictive pericarditis (CP) and normal subjects using two-dimensional (2D) echocardiography and quantitative tissue Doppler imaging (TQDI), and to investigate the value of this echocardiographic approach in the diagnosis of pericardial adhesion in CP.

Background: The relationship of the motion of pericardium and myocardium in CP has not been investigated by TQDI.

Methods: The motions of pericardium and myocardium and the difference between them were investigated using 2D echocardiography combined with TQDI technique in 30 normal subjects and 24 patients with CP. Systolic peak displacements of pericardium (Dp), outer-layer myocardium (Dq) and inner-layer myocardium (Dk) were measured from quantitative tissue displacement curves. The ratios of Dp/Dk and Dq/Dk were then calculated.

Results: In normal subjects, the motion of myocardium was found to be stronger than that of pericardium, but the motions of outer-layer and inner-layer myocardium were virtually identical. However, in patients with CP, the motion of outer-layer myocardium was significantly reduced approaching that of pericardium, while the motion of inner-layer myocardium was stronger than that of outer-layer myocardium. The ratio of Dp/Dk were higher in normal subjects than those in patients with CP (2.03±0.42 vs 1.48±0.53, P<0.05); while the ratios of Dp/Dk were higher in patients with CP than those in normal subjects (2.16±0.30 vs 2.22±0.29, P=0.05).

Conclusions: In normal person, myocardium motion is stronger than pericardium motion, relative motion exists between them. But the movement of outer and inner layers of myocardium is similitude. While in patients with constrictive pericarditis, because of the adherence of parietal and visceral pericardium, motion of outer layer myocardium adjacent to visceral pericardium was limited. Observation of motion of pericardium and myocardium using 2D echocardiography and TQDI will provide new objective indexes in the diagnosis of pericardial adherence, which is the most important pathological change in patients with constrictive pericarditis.

45. Assessment of the Diagnostic Performance of Myocardial First-Pass Perfusion Magnetic Resonance Imaging
1SF Chu, 2SJ Sha, 1CM Chan, 1MK Chan, 1M Cheng, 1LK Chan, 1KC Chan, 1CY Wong, 1HS Ma, 2LY Tam, 1CL Fu, 2CW Cheng, 1KY Lee, 1D Ho, 1KT Chan, 1KC Ho, 1CS Ching
1Division of Cardiology, Department of Medicine, Queen Elizabeth Hospital, Hong Kong
2Department of Radiology & Imaging, Queen Elizabeth Hospital, Hong Kong

Objectives: To determine the diagnostic accuracy of myocardial first-pass perfusion magnetic resonance imaging compared with conventional coronary angiogram.

Method: We analyzed 16 patients (male: female ratio = 9:7 with mean age 64.2±11.1 years) with suspected or known coronary heart disease who underwent both myocardial magnetic resonance imaging and conventional coronary angiogram within three months period. All patients received gadolinium- enhanced contrast magnetic resonance imaging and first-pass perfusion defects were assessed. The findings were compared with coronary angiography.

Results: All patients underwent both procedures without significant side effect. Adenosine was given in 15 patients (93.75%), adenosine stress test was not done in one patient because of poor cardiac function (ejection fraction 35%). The overall sensitivity, specificity, positive and negative predictive value to identify ≥50% stenosis was 73.3%, 94%, 93% and 85% respectively on pre-artery basis.

Conclusion: This study validates the diagnostic performance of myocardial first-pass perfusion magnetic resonance imaging in detecting coronary artery stenosis.

24 April 2008 J HK Coll Cardiol, Vol 16
46.
The Prognostic Impact Of Adenosine Cardiac Magnetic Resonance Perfusion Imaging In The Management Of Low To Moderate Cardiac Risk Patients
WS Chan, SC Cheung, CH Luk, CM Wong, J Ho, YC Ho, WK Tsang, S Lee, HF The
Division of Cardiology, University Department of Medicine, Queen Mary Hospital, HK SAR; Department of Radiology, Queen Mary Hospital, HK SAR; Sir Run Run Heart Centre, St Teresa's Hospital, HK SAR, China
Background: This study was designed to determine the diagnostic value of adenosine cardiac magnetic resonance (CMR) in low to moderate total number cardiac risk factor (TLCRF) patients presenting with chest pain. We hypothesized that adenosine CMR has a high negative predictive value in development of CAD or future adverse cardiac events. Methods: Adenosine CMR was performed on 470 pts who presented initially to the chest pain. Forty patients confirmed to have previous myocardial infarction defined by delay CMR and ten patients with suboptimal image quality were excluded. Patients were followed up during outpatient visits or contacted through telephone interview to determine the incidence of significant CAD defined as coronary artery stenosis >50% on angiography, new myocardial infarction (MI), heart failure, unstable angina or cardiovascular death. Results: Totally 420 patients (M: F = 206:114; mean age=59±13; mean baseline TLCRF=2.6±1) underwent rest and adenosine stress CMR. At mean follow-up period 24±7 months, there were 44 adverse events (36 patients underwent coronary percutaneous angioplasty due to unstable angina and 2 new MI) and 6 deaths. Adenosine CMR had 89% sensitivity and 86% specificity in detecting subsequent CAD. Despite TLCRF, wall motion abnormality and abnormal CMR perfusion can significantly predicting the prognosis outcome (p<0.04 vs p=0.0001 respectively), in a stepwise multivariate model, the abnormal CMR perfusion was the strongest predictor of the event rate (adjusted hazard ratio 1.53 per 1% increase, p<0.001).
Conclusions: Among the low to moderate cardiac risk patients who had chest pain, adenosine CMR has a high sensitivity and specificity in predicting the future development of significant CAD and adverse events.
ABSTRACTS

Abstracts for Free Paper Session:

CARDIAC SURGERY

47. Predicting major early surgical morbidity and intensive care length of stay (ICLOS) after adult cardiac surgery using the EuroSCORE.

WK Au, YT Hong, MP San, NR Das, LC Cheng
Department of Cardiothoracic Surgery, *Department of Anaesthesia, Grantham Hospital, University of Hong Kong, Hong Kong SAR, China.

Introduction: The ability to predict early mortality and morbidity after major cardiac surgery is known to be useful in many areas when providing quality surgical care. The European System for Cardiac Operative Risk Evaluation (EuroSCORE) has been widely validated for predicting in-hospital mortality. Few studies however exist that evaluate the performance of the EuroSCORE in predicting early morbidity. The aim of this study is to evaluate the performance of EuroSCORE in predicting major in-hospital morbidity and the need for prolonged intensive care after cardiac surgery.

Methods: 745 consecutive adult cardiac surgical patients who underwent CABG and/or valve surgery at the Grantham Hospital from July 2001 to December 2003 were included in this study. EuroSCORE's, predefined postoperative in-hospital major morbidity and ICLOS data were collected prospectively and analyzed using SPSS 11. The ability of the EuroSCORE to discriminate outcomes was assessed using C statistic (area under receiver operating characteristic curve) while the calibration was evaluated by the Hosmer-Lemeshow goodness-of-fit test.

Results: EuroSCORE showed good discriminatory ability and good calibration in predicting prolonged ICLOS > 3 days (C statistic: 0.713, Hosmer-Lemeshow: p = 0.52), need for ventilatory support > 2 days (C statistic: 0.829, Hosmer-Lemeshow: p = 0.57), and new postoperative renal failure (C statistic: 0.738, Hosmer-Lemeshow: p = 0.61), its ability to predict the development of postoperative strokes, myocardial infarction, major sepsis (pneumonia, septicemia or mediastinitis), and need to reopen for bleeding and/or tamponade were however unsatisfactory.

Conclusions: EuroSCORE can be used to predict prolonged ICU stay and specific morbidities such as the development of new post-operative renal failure and prolonged ventilatory support. And this has clinical implications in terms of providing more detail informed consent, quality of care assessment and hospital resources allocation.

48. Anterior Mitral Valve Leaflet Repair – midterm results

Chiu T.L., Chiu S.W.C., Cheng L.C., Au W.K.T. Cardiothoracic Surgical Unit, Grantham Hospital, Hong Kong SAR, China

Purpose: Posterior mitral valve leaflet prolapse can be treated with standardized surgical techniques and the results are excellent. However, anterior leaflet prolapse remain a surgical challenge worldwide. This study aimed to review the results of mitral valve repair for anterior leaflet prolapse.

Methods: All patients with anterior mitral valve leaflet repair in Grantham Hospital were identified. The records were reviewed. A cross-sectional questionnaire assessing the symptom and a follow-up echocardiogram were performed.

Results: From June 2001 to June 2006, there were 49 anterior mitral valve leaflet repair performed. Before operation, all patients had severe mitral regurgitation (MR) and 59.2% of them were symptomatic. 69.3% of MR was degenerative in nature. Most commonly used repair technique is artificial chordae (89.7%). One 30-day mortality (2.1%) and complications were present in 8 patients. Pre-discharge echocardiogram showed 87.8% of patients had no MR and the remaining had mild MR. At a mean follow up of 20.7 months (7.56), all patients had significant symptomatic improvement. Follow up echocardiogram showed 67.3% of them had no MR, 16% had mild MR and 8.6% had moderate or above MR. 9 out of 24 patients reverted to sinus rhythm and totally 20 patients did not require warfarin at follow up. One patient require redo operation, thus, actuarial redo-free survival at 5 years was 93.7 ± 3.9%. Late complications include stroke and bleeding occurred in 3 patients. Event-free actuarial survival at 5 years was 72.5%.

Conclusion: Anterior mitral valve leaflet repair is a safe and effective procedure. Mitral valve repair should be preferred over replacement in mitral regurgitation even in anterior mitral leaflet prolapse.

49. Early and Mid-term Analysis of Right Thoracotomy versus Sternotomy for Isolated Tri-cuspid Valve Replacement with Previous Open Heart Surgery.

Becker B.A., Au W.K., Chiu W.H., Chiu S.W., Cheng L.C.
Division of Cardiothoracic Surgery, Grantham Hospital, Department of Surgery, University of Hong Kong Medical Center, HK SAR

Introduction: In most tri-cuspid valve replacements (TVR) previous open heart surgery had been performed, with heavy scarring and large cardiomegaly, posing great technical difficulties. Risk of lacerating the underlying structures during re-transthoracotomy may be reduced by performing the surgery through a right thoracotomy wound.

Aim: To assess the safety and compare clinical outcomes of islet cusp valve replacement via sternotomy and right thoracotomy.

Method: Patients with previous open heart surgery who had undergone isolated TVR with bioprostheses were retrospectively studied.

Results: 15 sternotomies and 7 right thoracotomies isolated TVRs between 2000-2006 were performed. Pre-operative characteristics (age, gender, liver and renal function, clinical presentation, NYHA functional status, echocardiography) were comparable. Operative characteristics were similar, but the thoracotomy group had a significantly longer cardio-pulmonary bypass time (p=0.038). There were 2 in-hospital deaths in the sternotomy group (13% and 14% in the thoracotomy group p=1.0). Post-operative renal failure (7% and 17%) and high dose inotropic usage (13% and 17% thoracotomy) were similar in both groups. The sternotomy group however had shorter hospital stay (p=0.023) but less often required prolonged ventilation (48 hours) (p=0.05). There were no differences in actuarial survival between the two groups (p=0.8), with 3 year survival of 80% in the sternotomy group versus 71% in the right thoracotomy group.

Conclusions: Re-thoracotomy remains the mainstay for isolated TVR in patients with previous open heart surgery. When indicated, right thoracotomy is still a safe option, with an increased risk of a longer hospital stay and prolonged ventilation.


Cally E.H., Au W.K., LC Cheng, Department of Cardiotoracic Surgery, Grantham Hospital. The University of Hong Kong Medical Center, HK SAR

Purpose: To evaluate the early outcome of patients having aortic root replacement by modified Bentall procedure in a single institute.

Methods: Retrospective review of 60 consecutive patients who underwent aortic root replacement with composite graft using modified Bentall procedure from July 2001 to December 2007. Indications of operations were aortic dissection in 24 patients (40%), aorto-iliausal occlusion in 24 (40%), chronic atherosclerotic aneurysm in 11 (18%), aortic insufficiency in 8 (13%), and infected descending valve conduit in 1 patient (2.2%). Age of patients ranged from 7 to 71, with mean age of 42.3 years. Twenty-eight (46.7%) of them had Marfan syndrome. There were 23 redo operations. Four patients had concomitant total arch replacement. Operations were elective in 46 cases and emergency in 14.

Results: There was no operative in-hospital mortality. No patient suffered from low cardiac output syndrome, permanent neurological deficit or acute renal failure necessitating dialysis. However, 3 patients (5%) had re-entry for haemostasis, 4 (6.7%) had exploration of wound and re-wiring for mediastinitis and 2 (3.3%) had pericardial drainage for significant pericardial effusion. The mean cardio-pulmonary bypass time was 194 min. (ranged from 90-247 min), the mean aortic cross clamp time was 157 min (ranged from 61 to 246 min).

Conclusion: The excellent short-term results of modified Bentall operation makes it the standard and the procedure of choice in patients with aortic root pathology. With the introduction of novel haemostatic agent and operative technique, further drop in morbidity and mortality are expected. Lift-off clinical and radiological follow-up are required to evaluate its long-term outcome.
HK COLLEGE OF CARDIOLOGY, SIXTEENTH ANNUAL SCIENTIFIC CONGRESS

ABSTRACTS
Abstracts for Free Paper Session:

MISCELLANEOUS

51.

Causes of haemodynamically significant pericardial effusion requiring pericardioscopy: a 16-year experience in a regional hospital

Gurt SH, Cheng, KL, Fau, CY Cheung, WC Ko, MC Choi, TS Yue, KK Chan, SK, LI; Division of Cardiology, Department of Medicine, Pamela Youde Nethersole Eastern Hospital, Hong Kong SAR, China

Purpose: According to epidemiology studies in the West, there was a change in etiologies of pericardial effusion (PE) leading to cardiac tamponade, with a decrease in the incidence of tuberculosis, and an increase in malignancy and infectious pericarditis compared to invasive cardiovascular procedures. We reviewed all the cases of PE in the clinical setting of cardiac tamponade in a regional hospital over past 16 years. The distribution of various causes and any temporal change of the pattern, and the morbidity of those patients without obvious cause on presentation were analyzed.

Method: We performed a retrospective study of all patients with haemodynamically significant PE who underwent pericardioscopy in a 16-year period (1st July 1992 to 30th June 2007).

Results: Of 129 patients who had 134 pericardioscopies for selecting cardiac tamponade, the most common cause was malignancy (50.8%). The other common causes were complications of acute myocardial infarction (12.1%), infectious pericarditis, namely septicemia in cardiac or radiological procedures (10.4%), and idiopathic disease (7.5%). Tuberculosis remains a rare cause nowadays (1 patients, 2.7%).

Among those 47 patients without obvious causes (known malignancy, tuberculous, septicemia in myocardial infection and some dissection) on presentation, newly found cancer accounted for the majority (19 patients, 40.4%). Comparing the first and second five-year period of the study, there was no statistically difference in the change of pattern over all the etiologies, but an increasing trend was observed for malignancy related causes (p=0.07).

Conclusions: Malignancy is the most common cause of PE leading to cardiac tamponade, and there is a trend of increasing incidence over the last decade. Moreover, it is the most common cause of unexplained PE accounting for two-thirds of those patients. A more extensive search for underlying malignancy is warranted in these patients.

52.

Feasibility and Reliability of Self-monitoring Oral Anticoagulation

KF Leung, KM Liu, CT Wong, CT Luen, YM Lai, W Mak, CS Yue. Division of Cardiology, United Christian Hospital, Hong Kong SAR, China

Purpose: Self-monitoring of oral anticoagulation can lead to reduction in thrombembolism, major haemorrhage, total mortality, and total healthcare costs. We tested to test the feasibility and reliability of using a portable coagulometer for self-monitoring of oral anticoagulation treatment in local setting.

Method: All patients with good comprehensive ability or good family support followed up in cardiac anticoagulation clinic. We tried to test the feasibility and effectiveness of our new self-monitoring coagulometer to follow up in increasing and titration of oral anticoagulant.

Results: Of 129 patients who had 134 pericardioscopies for selecting cardiac tamponade, the most common cause was malignancy (50.8%). The other common causes were complications of acute myocardial infarction (12.1%), infectious pericarditis, namely septicemia in cardiac or radiological procedures (10.4%), and idiopathic disease (7.5%). Tuberculosis remains a rare cause nowadays (1 patients, 2.7%).

Among those 47 patients without obvious causes (known malignancy, tuberculous, septicemia in myocardial infection and some dissection) on presentation, newly found cancer accounted for the majority (19 patients, 40.4%). Comparing the first and second five-year period of the study, there was no statistically difference in the change of pattern over all the etiologies, but an increasing trend was observed for malignancy related causes (p=0.07).

Conclusions: Malignancy is the most common cause of PE leading to cardiac tamponade, and there is a trend of increasing incidence over the last decade. Moreover, it is the most common cause of unexplained PE accounting for two-thirds of those patients. A more extensive search for underlying malignancy is warranted in these patients.

54.

The expression and clinical significance of advanced oxidized protein products in patients with acute coronary syndrome

XIONG You, LIU Xingming, ZHANG Hong, JING Xiaoli, LI Xin, LI Yiping, TANG Hua. Department of Emergency Medicine, the first affiliated hospital of Sun Yat-sen University, Guangzhou 510080, China

Purpose: To investigate the expression and clinical significance of advanced oxidized protein products (AOPP) in patients with acute coronary syndrome (ACS).

Methods: The Serotonin and hs-CRP were determined in 282 patients with ACS, who were diagnosed with the criteria from the ACC/AHA in 2001, including 78 patients with unstable angina pectoris (USAP group), 62 patients with acute non-ST-segment elevation myocardial infarction (NSTEMI group), and 68 patients with acute ST-segment elevation myocardial infarction (STEMI group), 55 other patients with stable angina pectoris were taken as stable angina pectoris group (CAG group). 60 out-patients without coronary artery disease, who matched with study subjects for age and gender, comprised the control group without coronary artery disease. The differences of serum AOPP and hs-CRP among USAP group, NSTEMI group, STEM group, SAP group and control group were observed. The correlation between AOPP and hs-CRP levels was also observed.

Results: The AOPP and hs-CRP levels in patients with ACS were significantly higher than those in SAP group and control group (P<0.05). The AOPP and hs-CRP levels in acute myocardial infarction were significantly higher than those in USAP group, especially in group of ST-segment elevation myocardial infarction. Positive correlations were noted between AOPP and CRP level (r=0.648, P<0.01).

Conclusion: The data shows that advanced oxidized protein products may play an important role in the pathophysiology of ACS. The serum AOPP level may be taken as a diagnostic indicator in clinical evaluation of acute coronary syndrome.

Key words: Acute coronary syndrome; Oxidation stress; advanced oxidized protein products; high-sensitivity C-reactive protein
ABSTRACTS

Abstracts for Free Paper Session:

PAEDIATRIC CARDIOLOGY I

55. Congenital Long QT Syndrome in Hong Kong Chinese Children
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Objectives: The congenital long QT syndrome (LQTS) is a rare inherited cardiac arrhythmia syndrome that may cause syncope and sudden death. In this retrospective review we described the features of LQTS in Hong Kong Chinese children.

Methods: Hospital records of 11 LQTS children seen since 1996 were reviewed. All cases were classified as high probability according to the 1993 LQTS diagnostic criteria formulated by Schwartz.

Results: The mean age at diagnosis of the 11 patients (4 girls, 7 boys) was 7.75 years (1 day – 14 years). The mean QTc at diagnosis was 0.54s (0.49 – 0.64). Five patients had familial history of LQTS, or prolonged QTc. The initial symptom was syncope in 5 patients (45%). Two small infants presented with ventricular tachycardia (VT) and 2:1 atrioventricular block. Four patients (36%) were asymptomatic, with long QT noted on electrocardiography for various reasons. Two patients had congenital heart disease: atrial septal defect 1, ventricular septal defect 1. One patient is suffering from myotonic dystrophy. Seven patients underwent exercise test and all cases did not show shortening of QT interval on exercise. Drug treatment was given to 10 patients; beta blocker 7, mexiletine 1, beta blocker and mexiletine 2. Pacemaker and implantable cardio-defibrillator (ICD) were implanted in 1 and 2 patients, respectively. On follow-up (mean duration = 5.5 years, 3 months to 11.5 years), there was no sudden death, however, 3 patients (30%) developed syncope or palpitation, including the 2 patients with ICD implanted.

Conclusions: Congenital LQTS is rare in Hong Kong Chinese children. With treatment by medications, and pacemaker or ICD, sudden death can be prevented.

56. Effect of selective α1 receptor agonist in the treatment of children with postural orthostatic tachycardia syndrome
Chen Li, Du Jianan, Zhang Qingshou, Li Wenchun, Wang Yuli, Tang Chaoxiu
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Purpose: The study was designed to examine the role of selective α1 receptor agonist midodrine hydrochloride in the treatment of children with postural orthostatic tachycardia syndrome.

Methods: One hundred and two children (41 male, 61 female, age 5-19 yrs, mean age 12.2±2.9 yrs) who were seen at Peking University First Hospital were included in the study and clinical investigations, standing test, basic head-up tilt test and supine induced orthostasis- provoked head-up tilt test under quiet circumstance were conducted. They were randomly divided into group I (with midodrine hydrochloride and oral rehydration salt treatment), group II (with midodrine and oral rehydration salt treatment only) and group III (with oral rehydration salt treatment only). At the follow-up end point, the cure rate, improvement rate and effective rate of symptoms, and the percentage of HUT tests positive in negative responses were compared among three groups.

Results: The symptom improvement rate in group I was significantly higher than that of group II and group III after three and six weeks of treatment (100.0% vs 36.2% vs 42.4%, P<0.01; 100.0% vs 57.4% vs 42.4%, P<0.01). The cure rate at follow-up end point in group I was significantly higher than that of group II and group III (77.5% vs 46.0% vs 17.3%, P<0.01). The effective rate at follow-up end point in group I was also significantly higher than that of group II and group III (75.0% vs 61.7% vs 36.8%, P<0.01). The percentage of HUT changing from positive to negative response among group after three weeks of treatment was not significantly different (31.8% vs 29.8% vs 12.1%, P=0.05), but it was significantly different (81.0% vs 44.7% vs 48.3%, P<0.05) after six weeks of treatment. During follow-up, we discovered that the symptom recurrence rate in group I was significantly lower than group II and group III respectively (P<0.01). The time of symptom improvement in group I was shorter than group II and III during follow-up.

Conclusions: Selective α1 receptor agonist midodrine hydrochloride is effective in the treatment of children with postural orthostatic tachycardia syndrome.

57. Retimomyography evaluation of multi-detector CT angiography and 3D reconstruction in the diagnosis of coarctation of the aorta in young children
Xu Song He1,2, Guo-jing Huang1,2, Mei-er Pei2, Xin Li1, Lin Wei1, Fang Liu1, Bin Xia1, Guo-jing Li2

Objective: To assess the value of multi-detector CT (MDCT) angiography and 3D reconstruction in patients with coarctation of the aorta in children. Methods: Nineteen patients (median age 2m, range 15days to 28months) with suspected or proven coarctation of the aorta by echocardiography were included in this study. MDCT and 3D reconstruction were used to diagnose the coarctation and the associated cardiac abnormalities, and the sensitivities were evaluated as compared with CT axial imaging and echocardiography and surgical findings. Results: Nineteen vessels were identified as coarctation of the aorta and five as hypoplasia of the aortic arch on studies. Axial images had the worse performance for vessel narrowing. Detection sensitivities of coarctation were 89.5% for axial, 100% for both multiplanar and 3D volume-rendered images. Moreover, MDCT was able to clearly display the location and extent of the coarctation. All coarctations were juxta-ductal with results in luminal narrowing of greater than 50%. Focal defects were observed in 17 cases, and diffuse defects in 2 cases. The sensitivity of MDCT diagnosis for coarctation of the aorta was 100%, which was higher than that of color Doppler echocardiography (CDE) (89.5%). Ventricular septum defect was diagnosed by MDCT in 14 cases with 1 missed, and the sensitivity was 93.3% (14/15), which was lower than that of CDE (100%, 15/15). In addition, six patients had patent ductus arteriosus. Two patients in this study had collateral vessel formation. Conclusions: MDCT with 3D reconstruction represent a reliable non-invasive technique for the assessment of coarctation of the aorta.

Key words: Aorta; coarctation; Multidetector Computed Tomography; Children

58. Echocardiographic assessment of conjoined twins with congenital heart disease
Zhang Yue-qi, SUN Kun, WU Lan-ping, CHEN Guo-zen and ZHANG Zhi-fang
Department of Pediatric Cardiology, Shanghai Children’s Medical Center, Shanghai Jiaotong University, Shanghai 200127, China

Purpose: Conjoined twins are very rare congenital malformation, the aims of this study was to determine the accuracy of echocardiography in delineating the degree of cardiac fusion, intracardiac anatomy, and ventricular function of 6 sets of conjoined twins with congenital heart disease.

Methods: Echocardiography was performed and this imaging was compared with findings of CT, MRI, and angiocardiography in 6 sets of conjoined twins.

Results: All sets presented varying degrees of congenital cardiac malformations, separate hearts and pericardium (n = 1), separate hearts and common pericardium (n = 3), fused atria and separate ventricles (n =1), and separate atria and fused ventricles(n =1). Ventricular function was good in all twins, correlated well with clinical condition. Intracardiac anatomy was correctly diagnosed in 5 sets, the degree of cardiac fusion was correctly diagnosed in 4 sets. Four sets with separate heart were correctly surgically separated, after operation, 2 cases died of non-cardiac events, two sets with fused heart died during operation.

Conclusion: Echocardiography accurately delineates cardiac fusion, intracardiac anatomy, and ventricular function in the majority of conjoined twins with congenital heart disease.
ABSTRACTS

Abstracts for Free Paper Session:

59.

The spatiotemporal expression of histone acetyltransferases P300 and CBP during mouse embryo heart development

Chen Guo Zhen, Zhu Jing, Wu Gang, Sun Hui Chao, Tian Jie
The Department of Cardiology, Children’s Hospital, Chongqing Medical University

Purpose Histone acetyltransferases (HATs) including P300, CBP, PCAF, GCN5 and SRC1 are transcriptional co-activators that activate expression of eukaryotic genes. Previous studies revealed that the lack of some of these factors would cause abnormal embryogenesis. However, whether these proteins play the important role in embryo heart development is not clear. This study is to investigate the spatiotemporal expression of P300 and CBP in the developing mouse heart.

Methods 39 samples from normal mouse fetal hearts in embryonic days 7.5-18 and postnatal 1 day, 3 months were included in this study. SABC immunohistochemistry was used to detect the expression and distribution changes during every stage of mouse cardiac morphogenesis.

Results High rate of positive cells of P300 expressed in ventricular, atrial myocardium, interventricular septum and trabecular naxis from E7.5 to adult mouse heart. No CBP expression was detected in cardiac precursor cells induction and specification in E7.5 embryo heart. Compared to the same stage and region of P300, CBP relatively lower rate of positive cells expressed. The difference is statistically significant (p<0.05)

Conclusion P300 and CBP were related to mouse embryo heart development, while their roles were different. P300 may play greater role in embryo heart development especially for cardiac precursor cells induction and specification and interventricular septum formation than CBP.

60.

Clinical value of serum concentration of N-terminal pro-brain natriuretic peptide in congestive heart failure in pediatric patients

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Purpose The aim of this study was to assess the value of serum N-terminal pro-brain natriuretic peptide (NT-proBNP) in the diagnosis of congestive heart failure (CHF) and evaluations of cardiac function in pediatric patients.

Methods 91 patients, aged from 1 month to 14 years old (median 2.1 years) were enrolled as the study group. According to the modified Ross Score, these patients were divided into four groups, no CHF group (35 patients), mild CHF group (25 patients), moderate CHF group (16 patients) and severe CHF group (17 patients). 43 matched patients without heart disease and heart failure were as the controls. Serum NT-proBNP and the left ventricular ejection fraction (LVEF) were measured using the electrochemiluminescence immunoassay and echocardiography respectively in all cases.

Results: The data of serum NT-proBNP were skewed but the log-normals of which were normal distribution. Serum NT-proBNP levels in the study group (median 594.3pg/ml, range from 13.2 to 60664.0 pg/ml) were significantly higher than those in the controls (median 94.0 pg/ml, range from 9.1 to 574.0 pg/ml; P<0.01). The concentrations of NT-proBNP in serum were developed successively along with the severity of cardiac function. It was positively correlated with modified Ross Score (r=0.79, P<0.01), and negatively correlation with LVEF (r=-0.42, P<0.01) respectively. Using serum NT-proBNP concentration ≥344 pg/ml as the cut point for diagnosing CHF, the sensitivity was 89.75%, the specificity 90.0% and the area under the ROC curve was 0.95.

Conclusion: The concentration of NT-proBNP in serum can be used to diagnose CHF and assess cardiac function both high sensitivity and specificity in pediatric patients.
Abstracts for Free Paper Session:

PAEDIATRIC CARDIOLOGY II

61. Application of Real-time Three-dimensional Echocardiography in Percutaneous Transcatheter Closure of Congenital Heart Septal Defect

CHEN Guo-zhen, SUN Kun, GAO Wei, ZHANG Yu-qin, HUANG Mei-rong
Department of Pediatric Cardiology, Shanghai Children’s Medical Center, Medical College of Shanghai Jiao Tong University, Shanghai 200127

Purpose: To evaluate initial application of real-time three-dimensional echocardiography (RT-3DE) in percutaneous transcatheter Amplatzer closure of congenital heart septal defect.

Methods: During the catheter-based interventional procedures, twenty patients (9 males, 11 females, mean aged 6.9 ± 4.6 years) of congenital heart septal defects including 12 secondary atrial septal defects and 8 ventricular septal defects, were examined and guided by Live 3D, Full Volume and 3D Color using Phillips Sonos 7500 and IE33 echocardiographic system with X-matrix transducer (X4, X 3-1 and X 7-2 probe). The offline qualitative and quantitative analyses were made in the Tomtec and Qlab three-dimensional workstations, and their results were compared with those of two-dimensional echocardiography (2DE).

Results: The qualitative diagnosis of RT-3DE in twenty patients with congenital heart septal defects were more informative than those of planar 2DE, objectively demonstrating dynamic detailed visualization of cardiovascular normal anatomy and abnormal pathology such as the anatomic shape, size and position of septal defect. Furthermore, the whole course of interventional procedure was guided and monitored online by RT-3DE, providing pushed location of guide-wise and catheter sheath, spatial morphology of Amplatzer device and its relation with contiguous cardiac structures, etc. After the device was first released, there were the incorrect spatial location of Amplatzer occluder in 2 cases with atrial septal defect and the smaller size of device in 1 case with atrial septal defect. Under the guidance and monitoring of RT-3DE, the second released were correctly completed through replacing the larger device and relocating the position of delivery sheath and device. There was no residual defect displayed by Live 3D and Full Volume, and no residual left-to-right shunt confirmed by 3D color. In addition, from the quantitative analyses in the Tomtec and Qlab workstation, diameter of septal defect measured [(1.15 ± 0.67) cm] by RT-3DE was well correlated with that measured [(1.01 ± 0.95) cm] by 2DE (r=0.96, P=0.0001), but the measurement of RT-3DE was correlated with the size of its device (r=0.97, P=0.0001) better than that of 2DE (r=0.92, P=0.0001).

Conclusion: With instant visualization and online guidance of percutaneous transcatheter closure of congenital heart septal defect, RT-3DE will be a safe and valuable imaging technique for selecting preoperative patient, choosing suitable device, performing optimal interventional manipulation and making postoperative effect assessment.

62. Analysis of the clinical phenotype and pathogenesis in children with 22q11.2 deletion syndrome

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Purpose: This retrospective study is designed to improve our understanding and diagnostic ability by analysis of the diversity clinical features and its pathogenesis in children with 22q11.2 deletion syndrome.

Methods: Seven patients confirmed with 22q11.2 DS who was diagnosed in individuals with a submicroscopic deletion of chromosome 22 detected by molecular cytogenetic analysis were reviewed. We analysed their clinical characteristics, method of diagnosis and management.

Results: There were 4 boys and 3 girls in this group, one of them was prenatal diagnosis. Others were confirmed at the mean age of two month. The clinical findings comprised of one hundred percent of heart malformation and anomaly face, immune deficiency is present in 28.6%, hypocalcemia and cleft palate are present in 14.3%. All cases confirmed by FISH test, management with usual manners depending on the individuals clinical features.

Conclusions: Heart malformation and anomaly face are the prominent characteristics in this group of 22q11.2 DS, it is mainly caused by gene mutation and can be diagnosed early in life by individuals clinical features and FISH test. The cardiovascular defects involved with outflow tract problems and immunodeficiency secondary to the T-cell production abnormality are the key factors relate to the anticipation.

63. Regulatory Effect of Hydrogen Sulfide on Vascular Collagen Content in Spontaneously Hypertensive Rat

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Purpose: The study aimed at examining the regulatory effect of hydrogen sulfide on vascular collagen remodeling in hypertensive rats.

Methods: After 5 weeks, we measured tail blood pressure, rate of production of endogenous hydrogen sulfide (H2S), levels of hydroxyproline and collagen type I, collagen type III protein expression in thoracic aorta and [3H] incorporation of thymidine (TDR), [3H]-proline incorporation and [3H]-hydroxyproline secretion in cultured vascular smooth muscle cells (VSMCs). We also examined effect of NaHS on AT1 receptor binding affinity.

Results: In SHR, the content of vascular hydroxyproline and the level of collagen type I were high, collagen type I immunohistochemical staining in thoracic aorta was strong as compared with those in W KY rat. [3H]-TDR and [3H]-proline incorporation and [3H]-hydroxyproline secretion were also higher in cultured VSMCs of the SHR than those of W KY rats. However, vascular H2S production was lower than that of W KY rat. Treatment with NaHS increased vascular H2S production in SHR, and partly reversed the changes in [3H]-TDR and [3H]-proline incorporation and [3H]-hydroxyproline secretion. In cultured VSMC, [3H]-TDR and [3H]-proline incorporation stimulated by angiotensin II was inhibited by NaHS incubation. The inhibitory effect of NaHS on VSMC proliferation and collagen generation was stronger in the SHR than W KY group. Moreover, NaHS could decrease the AT1 receptor binding and the binding affinity of the AT1 receptor.

Conclusion: In SHR, showing vascular remodeling and collagen accumulation, the endogenous hydrogen sulfide pathway is involved in the regulation of excess vascular collagen.
ABSTRACTS

Abstracts for Free Paper Session:

64.

Left Anterior Descending Coronary Artery Flow Velocity Dynamics Assessed by Transcranial Doppler Echocardiography in Normal Children

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Background Coronary flow dynamics measurements have provided useful clinical and physiologic information. However, there are few reports regarding coronary hemodynamics in normal children during the process of growth. Recent advances in Doppler and color echocardiographic technique enable us to estimate noninvasively coronary flow dynamics in children and even in neonates.

Objectives The purpose of this study was to evaluate the feasibility of measurement of coronary flow velocity and coronary flow velocity reserve (CFVR) in the left anterior descending coronary artery (LAD) during transcranial Doppler echocardiography (TDE) and to assess the characteristics of coronary flow dynamics in normal children.

Methods The distal LAD peak diastolic velocity (PDV) at rest was measured by Doppler echocardiography in the 78 healthy children, and the peak diastolic velocity during maximum hyperemic response after intravenous administration of adenosine triphosphate 160μg/kg/min for 5 minutes was recorded in 15 of the total. CFVR was defined as the ratio of peak hyperemic to baseline peak diastolic velocity.

Results The diastolic flow signals of LAD at rest were recorded in 93.4% (71/75). The mean PDV was 33.05±8.17cm/sec, which increased significantly with heart rate (r=0.430, p=0.001).

Among the normal 15 children aged 8 months to 11.5 years (mean 3.3±3.4 years), GFR calculated from PDV was 2.57±0.83 and indicated significantly positive correlation with age (r=0.674, p<0.006).

Conclusions Normal data obtained by the use of TDE in the present study may provide a basis of the understanding of coronary flow dynamics in children. These age-related physiological characteristics in coronary hemodynamics must be taken into consideration in the study of the coronary circulation in children.

65.

Effects of transient outward potassium current on ventricular electrophysiological remodeling in rabbits with dilated cardiomyopathy

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Purpose Arrhythmia in dilated cardiomyopathy (DCM) was considered to be related with ventricular electrophysiological remodeling which manifested as the change of action potential (AP), and Transient outward potassium current (Ito) is one of important ion components which form AP of cardiocytes. To make the mechanism of ventricular electrophysiology remodeling in DCM clear, the patch clamp was applied to explore the change and effect of Ito on ventricular electrophysiology remodeling of DCM rats.

Methods Forty Sprague-Dawley (SD) rats were randomized into two groups: 1) control group(n=20), 2) DCM group (n=20). Adriamycin was applied in DCM group to establish DCM model by intraperitoneal injection. Pathological section and transcranial echocardiography (TTE) technique was applied to verify the successful establishment of the rat DCM model. Whole-cell electrophysiological recording of patch clamp was used to detect changes of the Ito current in isolated left ventricular myocytes in rats, and the curve of I-V relationship of Ito was depicted.

Results 1) In DCM rats, 7 of 15 survival rats were used to establish DCM model after 8 weeks. 12 rats established DCM model successfully, the probability of success was 76.9%. 2) Ito current density of the rat Ito current to membrane capacitance of myocytes were significantly decreased in rats with DCM (18.6±4.5 pA/pF at +70mV) than those of control group (34.9±6.2 pA/pF at +70mV). The membrane capacitance was significantly higher in DCM rats (74.6±8.1 pF) than in normal rats (60.9±4.5 pF) (p<0.05). The curve of I-V of Ito in DCM group was decreased markedly.

Conclusions 1) The enlarged membrane capacitance or decreased number of Ito channels in DCM cardiocytes caused by cellular edema and hypertrophy so on have resulted in the downregulation of Ito current density. The downregulation of Ito current density may be one of main ion current changes in ventricular electrophysiological remodeling. 2) In ventricular electrophysiological remodeling in DCM, the downregulation of Ito current density resulted in the prolonged action potential duration (APD), the prolonged effective refractory period (ERP), and the prolonged repolarization, which often cause arrhythmia.

66.

The value of coronary angiography and adenosine triphosphate stress echocardiography for long-term follow-up in coronary artery lesions by Kawasaki disease

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Purpose This study was to assess the value of coronary angiography and adenosine triphosphate stress echocardiography for long-term follow-up in coronary artery lesions by Kawasaki disease.

Method The coronary angiography and adenosine triphosphate stress echocardiography were obtained in 9 children (1 female and 8 males) with a history of Kawasaki disease (4 with coronary aneurysms in acute stage, 4 with giant coronary aneurysms and 1 with dilatation of bilateral coronary arteries). The average age of the patients selected was 8.8 years old (age from 4 years old to 13 years old). Their ages at onset of the disease ranged from 1.5 to 8 years.

Result The coronary angiography showed that bilateral coronary aneurysms was found in 2 cases, left giant coronary aneurysm and multiple aneurysms of right coronary artery with stenosis was found in 1, multiple aneurysms of bilateral coronary arteries with stenosis was detected in 1, left anterior descending coronary aneurysms with formation of collateral branches in right coronary artery was presented in 1, dilatation of left coronary artery with stenosis in right coronary artery was presented in 1, dilatation of bilateral coronary arteries was found in 1, and the 9 patients were normal. The adenosine triphosphate stress echocardiography displayed that abnormal movements of ventricular walls was found in 7 cases, decrease of flow reserve in coronary artery was detected in 6 cases. Off the 9 patients 2 were normal. 5/9 patients had the same result in coronary angiography and echocardiogram and 8/9 in coronary angiography and adenosine triphosphate stress echocardiography.

Conclusion The coronary angiography is helpful and reliable to find the coronary artery lesions for long-term follow-up of the Kawasaki disease and monitor their changes. The adenosine triphosphate stress echocardiography is useful in evaluating the functions of the coronary artery. Both of them are beneficial for the evaluation of long-term follow-up in coronary artery lesions by Kawasaki disease.
Abstracts for Free Paper Session:

PAEDIATRIC CARDIOLOGY III

67. Value on Three-dimensional Echocardiography for Quantifying Left Ventricular Function in Conotruncal Defects

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Purpose: The aim of this study was to evaluate the accuracy of cardiac function in conotruncal defects (CTD) with 3DE such as ventricular volume, wall mass, stroke volume and ejection fraction, and to explore its clinical value.

Methods: Fifty-two children with CTD (mean age 3.2 ± 2.5 years) and forty-three children with normal hearts (mean age 3.0 ± 2.5 years) were examined by 3DE. The measurements of left ventricular volume and wall mass were obtained and calculated by 3DE with Torniac LV Volume Cap 4.2 software. The measurements of left ventricular volume and wall mass of 3DE in preoperative CTD were compared with those of 2D biplane Simpson's method in preoperative CTD, 3DE in control group and 2D biplane Simpson's method in control group. The results of 3DE and 2DE measurements in preoperative CTD were also compared with their postoperative conditions of clinical cardiac function.

Results: From the findings of analysis of variance and Student-Newman-Keuls (SNK) test, there was no significant difference between left ventricular function of normal children measured by 3DE and that measured by 2DE, but there was significant difference between left ventricular function of children with CTD measured by 3DE and that measured by 2DE. The measurements of left ventricular volume and wall mass in the CTD group were significantly underestimated and less correlated with their postoperative conditions of clinical cardiac function (r = 0.157, P < 0.001) than 3DE measurements (r = 0.392, P = 0.009). Furthermore, left ventricular function in the CTD group was poorer than that in the control group. Stroke volume and ejection fraction were reduced due to increasing end-systolic volume, while left ventricular wall mass increased due to the possible compensation of its muscular muscle. And the occurrence of postoperative low cardiac output would be increased due to the lower end-diastolic volume, stroke volume and ejection fraction.

Conclusion: 3DE could make a precise quantitative assessment. Thus, 3DE is very useful in providing more information for preoperative diagnosis and postoperative prognosis in CTD.

68. Sildenafil Improves Exercise Capacity in Patients with Severe Pulmonary Arterial Hypertension but may not Associate with Survival Benefit in Paediatric Patients

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Background: Oral sildenafil significantly improves exercise capacity and quality of life in patients with pulmonary arterial hypertension (PAH). However, published data of the survival benefit on long-term sildenafil therapy is limited.

Methods: Retrospective chart review of 9 patients who had received sildenafil therapy since 2004 was performed. Diagnoses were idiopathic pulmonary arterial hypertension (IPAH, n = 3), portopulmonary hypertension (PPHT, n = 2), Eisenmenger syndrome (ES, n = 3); secondary PAH associated with repaired congenital heart disease (n = 1). WHO functional class was assessed. Exercise capacity was assessed by 6-minute walk test (6MWT) at regular intervals. Echocardiography was used to assess haemodynamics on follow-up.

Results: We treated 9 patients (6 female) aged between 6 years and 33 years (median = 10.4 years) with sildenafil for periods from 2 to 38 months, with a mean of 16 months. The dosage of sildenafil ranged between 10 mg tid and 50 mg tid. All patients were of WHO functional class III. Eight patients had no response to acute vasodilator test at cardiac catheterization. All patients reported improvement of exercise capacity. Six patients were of WHO functional class II after treatment. 6MWT distance increased from 279±6 to 330±12 at 12 weeks and 28±6 at 6 months. Two patients reported mild epistaxis and there was no other significant adverse drug effect. Three patients died (1 PPHT, 2 IPAH) at 11.1, 3.1 and 1.8 years after commencement of sildenafil. Two patients died from massive hemoptysis and one patient died suddenly.

Conclusion: Oral sildenafil improves exercise capacity in patients with severe PAH of different etiologies. Our limited experience suggests there may not be survival benefit in patients with severe PPHT or IPAH despite improvement in exercise capacity. Long-term follow-up study is required.

69. The Role of Hydrogen Sulfide in the Development of Atherosclerotic Lesions in Apolipoprotein E-Knockout Mice

Yanfeng Wang, Dingfang Bu, Xinming Tang, Chaohong Tang, Jianbo Du. Department of Pediatrics, Peking University First Hospital, Beijing.

Purpose: The present study was designed to explore changes in the vascular cystathionine-γ-lyase (CSE) hydrogen sulfide (H2S) pathway during atherosclerosis and the regulatory effect of H2S on atherosclerotic progression, especially on intracellular adhesion molecule-1 (ICAAM-1) level.

Methods: Six-week-old male C57BL/6 and homozygous apolipoprotein E-knockout (apoE−/−) mice were randomly divided into 4 groups (n = 8 each): control, apoE−/−, apoE−/− + sodium hydrosulfide (NaHS) and apoE−/− + D-threohexahydroxypropylglycine (PPG). All mice were fed a standard chow diet and observed for 10 weeks.

Results: Compared with control mice, apoE−/− mice showed decreased plasma H2S level and aortic H2S production but increased aortic level of CSE mRNA, plasma level of ICAAM-1 and aortic level of ICAAM-1 protein and mRNA. Compared with apoE−/− alone mice, apoE−/− +NaHS mice showed increased plasma H2S level but decreased level of atherosclerotic plaque, plasma and aortic levels of ICAAM-1. apoE−/− +PPG mice showed decreased plasma H2S level but enlarged plaque size and increased plasma and aortic levels of ICAAM-1.

Conclusion: The vascular CSE/H2S pathway was disturbed in apoE−/− mice. H2S exerted an anti-atherogenic effect in the pathogenesis of atherosclerosis and inhibited the secretion and expression of ICAAM-1 in H2S-induced reduction of atherosclerotic lesions in apoE−/− mice.

70. Does Medical Therapy Can Induce Venous Remodeling in Children with Dilated Cardiomyopathy?

Department of Cardiology, The Children’s Hospital of Chongqing Medical University, Chongqing, China.

Objectives: This study was designed to investigate the feasibility of left ventricular (LV) remodelling using tissue Doppler imaging (TDI) technique and if medical therapy can induce venous remodelling in children with DCM.

Methods: Consecutive nineteen children with DCM were included in the present study, who were divided into group A (with right heart dysfunction) and group B (with severe cardiac dysfunction) according to NYHA class. All children with DCM were studied prior to and after initiation of medical therapy, among which six patients were followed up for two to twelve months after medical therapy. Twenty healthy age-matched children were controlgroup A. The in-plane TDI images of aortic arch, mitral valve, ascending aorta and right atrium of the LV were acquired simultaneously using CE Vivid 7 ultrasound imaging system. The time from QRS wave to peak systolic velocity (TVs) was automatically transformed into various color coding depending on the severity of delay, in the sequence of green, yellow, orange, and red. The TVs value can be measured automatically and expressed in milliseconds. The analysis of systolic and diastolic intervals of TVs of the 12 segments (TVS-SD) was calculated. The TVs-SD and TDI images of LV were compared and analyzed at baseline and after therapy in DCM group and compared to the controls.

Results: TVs segments were green and few segments were yellow in control group. But many segments were orange even red in DCM group, among which the colors of some segments were improved after therapy. (P < 0.01) and TVs-SD in DCM group (the TVs-SD was 55.8±17.5 ms in group A and 66.4±22.5 ms in control group) showed significantly longer than that of the control group (the TVs-SD was 29.9±19.2 ms in control group) (P < 0.05). And the atherogenic index increased with the decrease of NYHA class. The atherogenic index of the six patients who were followed up increased from 52.9±29.5 mm at 6 months to 69.9±31.7 mm at 12 months (P < 0.05), but the TVs value of most of the segments decreased (P > 0.05) after therapy.

Conclusions: Atherosclerotic contraction of LV in children with DCM presented frequently, which deteriorated with the decrease of NYHA class and could be improved probably through medical therapy.
71. Percutaneous Balloon Valvotomy for severe pulmonary Valve Stenosis in Young Infant
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Cardiovascular Center of Children Hospital, Fudan University, Shanghai 200032, China

Purpose: Percutaneous balloon valvotomy was studied retrospectively in young infants with severe pulmonary valve stenosis to assess its effects and potential role as an alternative therapy to operation.

Methods: Fourteen cases with critical or severe pulmonary valve stenosis admitted to our hospital from June 2006 to August 2007 underwent balloon valvotomy, with age 8days – 6months (mean age 94 days), body weight 3.5kg – 9.8kg (mean BW 5.6kg). Among these 14 patients, two cases were newborns with critical pulmonary stenosis, who appeared with heart failure and significant cyanosis when came to us and required prostaglandin infusion. Both newborns had a tripartite right ventricle with moderate to severe tricuspid regurgitation (TI). The other 12 babies were older than one month with severe pulmonary stenosis, four of which had severe TI and 2 had moderate TI. All patients had a right ventricular systolic pressure equal to or greater than systemic pressure with right to left or bi-directional shunt in PFO level, and 4 patients had PDA opening, 1 patient also with multiple small muscular ventricular septal defect. Balloon valvotomy were performed under general anesthesia in 10 patients (including 2 newborns) and caudal block combined with sedation in 4 patients.

Results: Immediately after dilatation, the pressure gradient from right ventricle to pulmonary artery decreased from 50 – 132 (88.2 ± 21.4) mmHg to 11 – 61 (26.7 ± 10.2) mmHg. No complication in all patients during or post dilatation. In 6 to 18 months' follow-up: (1) Pressure gradient further decreased or remain stable, except in 1 newborn, it gradually increased to 78mmHg in 6 months and second dilatation was performed with pressure gradient 27mmHg in another 12months follow-up. (2) Tricuspid regurgitation. Fortunately, 2 newborns only had mild TI in the follow-up. In the other 4 patients with severe TI pre-dilatation, TI was mild in 1 patient, moderate in 2 patients and severe in only 1 patient. There was no aggravation of TI. (3) Pulmonary regurgitation (PI): Most of patients had mild PI, no severe PI post-dilatation. (4) Symptoms: Clinically, all patients were doing well with asymptomatic.

Conclusion: Percutaneous balloon valvotomy is relatively safe and effective and should be considered a valid alternative to operation. It should be the first choice of such patients for its less trauma and low complication.
HK COLLEGE OF CARDIOLOGY, SIXTEENTH ANNUAL SCIENTIFIC CONGRESS

Abstracts for Free Paper Session:

PAEDIATRIC CARDIOLOGY IV

72. Outcomes of Percutaneous Radio-frequency-Assisted Valvotomy and Balloon Dilation in Patients with Pulmonary Atresia and Intact Ventricular Septum

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Purpose: Since 2004, percutaneous radio-frequency (RF)-assisted pulmonary valvotomy and balloon valvuloplasty has been introduced as alternative to surgical treatment in management of patient with pulmonary atresia and intact ventricular septum (PA-IVS). We sought to report and analyze our results of RF-assisted valvotomy and balloon dilation in our institution.

Methods: RF-assisted valvotomy and balloon valvuloplasty was performed in 10 consecutive neonates with PA-IVS from April 2004 to March 2008. Clinical data and outcomes were collected and analyzed.

Results: Eight patients underwent percutaneous RF-assisted pulmonary valvotomy and balloon valvuloplasty as initial treatment. Successful percutaneous valvotomy achieved in 7 patients. Two patients underwent modified Blalock-Taussig shunt was performed as the initial palliation, and had subsequent successful RF-assisted pulmonary valvotomy and balloon valvuloplasty. The median age intervention was 3.5 days (range 1-133) and the median weight was 3.1 kg (range 1.5 to 4.6). The mean tricuspid valve z-score was -0.77 ± 0.99. After valvuloplasty, mean right ventricular systolic pressure decreased from 99.9 ± 24.2 to 63.6 ± 16.7 mmHg (p=0.002). There was no catheter-related death. One late death was related to necrotizing enterocolitis. Self-limiting perforation of the right ventricular outflow tract occurred in 1 patient. The mean follow-up time was 18.4 ± 15.4 months. Two patients did not need further intervention. Six required further balloon valvuloplasty, and 4 of them needed right ventricular outflow reconstruction. Of the 9 survivors, eight patients achieved a biventricular circulation and 1 had 1/3 ventricular circulation.

Conclusion: Percutaneous radiofrequency-assisted valvotomy and balloon dilation is a safe and effective initial treatment in selected patients with pulmonary atresia and intact ventricular septum.

73. Outcomes of surgical management in critical low birth weight and premature infants with congenital heart defect.

Y P Mi on behalf of Cardiovascular Center, Cardiovascular Center, Children's Hospital, Fudan University, Shanghai, China

Purpose: The retrospective study was undertaken to evaluate early and mid-term results in infants, weighing less than 2500g, who underwent cardiac surgery on cardio-pulmonary bypass (CPB).

Methods: Since November 2003 to December 2007, 28 consecutive infants with congenital heart defects underwent early complete repair on CPB at our institution. 14 patients were premature. All patients were severely symptomatic. Mean age at operation was 27.46 days (range 1-61 days). Mean weight was 2391g (range 1500-2500g). Deep Hypothermia with Circulatory Arrest was used in 9. Indications for surgery were: ventricular septum defect 10, transposition of great arteries 6, total anomalous pulmonary venous drainage 5, pulmonary atresia with intact ventricular septum 2, coarctation of aorta 1, interrupted aortic arch 1, cor tritium 1, abnormal original of right pulmonary artery 1.

Results: There were two early deaths (7.14%). Mean duration of mechanical ventilation and intensive care unit stay was 113.9h and 14.4days, respectively. At follow-up (mean 16.87 months) there was one late death. 2 patients needed reintervention. Freedom from reintervention at 12 months was 84.4%.

Conclusions: Complete repair for congenital heart disease can be achieved in low weight critically III infants with acceptable outcome.

74. Dyslipidemia of 6- to 18-year-old children in the Beijing area

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Purpose: The present study was designed to understand the prevalence of dyslipidemia in children in the Beijing area.

Methods: From April to October 2004, we used cluster randomized sampling in a transecting epidemiological survey of 19,593 children 6 to 18 years old in areas of Beijing, including East city district, West city district, Haidian district, Chaoyang district in urban areas and Daxing district, Yingshi district, and Pinggu district in rural areas. We measured fasting capillary blood total cholesterol and triglyceride levels. TC=-5.20 mmol/L and/or TG=-1.70 mmol/L were considered abnormal.

Results: The prevalence of dyslipidemia in Beijing children was 9.6%; 8.2% in boys and 11.1% in girls. A total of 1.2% of children had elevated TC values and 8.8% elevated TG levels. Only 0.4% of children had both increased TC and TG levels. The prevalence of dyslipidemia in urban children was 10.6%; 10.2% in boys and 11.0% in girls. In rural areas, the prevalence was 6.1% in males and 11.2% in females. The prevalence of dyslipidemia in urban children was significantly higher than that in rural areas (10.6% vs 8.6%, P<0.01). Also the prevalence of dyslipidemia in girls was significantly higher than that in boys (11.1% vs 8.2%, P<0.01).

Conclusion: The prevalence of dyslipidemia in children in Beijing was higher than what was shown previously. Furthermore, our results showed the gender- and age-based epidemiological characteristics of dyslipidemia in children in urban and rural areas.

75. The temporary effect of sildenafil to pulmonary hypertension with congenital heart disease in children

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Purpose: To investigate the effect of oral sildenafil to pulmonary hypertension, systemic circulation and heart function with congenital heart disease in preoperative children.

Methods: To measure pulmonary artery systolic pressure(PASP), systolic blood pressure(SBP), diastolic blood pressure(DBP), mean artery pressure(MAP), heart rate(HR), cardiac output(CO), left ventricular ejection fraction(LVEF), left ventricular fraction shortening(LVFS) at 0 minute, 30 minute and 60 minute after sildenafil administration and adverse effect within 24 hours.

Results: There is statistical significance of decrease of PASP at three different time and it is most apparent 30 minutes after drug administration in moderate pulmonary hypertension group. There is statistical significance of decrease of LVEF, LVFS, CO at three different time; There is no statistical significance of HR, SBP, DBP, MAP; No adverse were observed within 24 hours.

Conclusion: Oral sildenafil can decrease pulmonary hypertension without decrease in system circulation and improve heart function.
76. Study on the noninvasive estimation of pulmonary vascular resistance by color M-mode echocardiography assisted with computer
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Purpose: This study was designed to determine the feasibility and accuracy of velocity propagation within main pulmonary artery (VP) from color M-mode Doppler imaging using custom software on a personal computer for noninvasive estimation of pulmonary vascular resistance (PVR).

Methods: Color M-mode imaging of pulmonary flow was obtained and then transferred to computer, the velocity propagation of pulmonary flow will be automatically obtained. Comparative studies among Doppler echocardiography, personal computer and cardiac catheterization for predicting PVR have been done in 20 children with congenital heart disease and 20 normal children.

Results: Velocity propagations of children with congenital heart disease were significant lower than those of normal children obtained by color M-mode echocardiography (38.38±18.89 vs 80.34±51.65, P<0.01), and correlated well with invasive PVR measurements (r=−0.69, P<0.01). The correlation and repeatability of VP obtained by the custom software were better than VP obtained by Doppler echocardiography (r=0.78, P<0.01). A VP cutoff value obtained by the custom software of 35.910 had a sensitivity of 92.9% and a specificity of 100% to determine PVR>16 kPa·s/L.

Conclusion: PVR could be accurately estimated by the velocity propagation within pulmonary artery obtained by color M-mode echocardiography using custom software on a personal computer.
P1.
Evaluation of Ventricular Resynchronization in Children with Dilated Cardiomyopathy Using Tissue Synchronization Imaging
Department of Cardiology, The Children’s Hospital of Chongqing Medical University, Chongqing, China

Abstract Objective To evaluate the left ventricular systolic function in children with Dilated cardiomyopathy (DCM) by tissue synchronization imaging (TSI) technique.
Methods Consecutive sixteen children with DCM were included in the present study. Twenty children without any cardiac diseases were controls. Tri-plane TSI images of apical four-chamber, apical two-chamber and apical long-axis views were obtained simultaneously using GE Vivid 7 ultrasound imaging system. The TSI images and the time to peak systolic velocity(Ts) were analyzed offline. Standard deviation of Ts of the 12 LV segments (Ts-SD) and maximal difference in Ts between any 2 of the 12 LV segments (Ts-12) were calculated.
Results Most segments of LV were green and few segments were yellow in control group. But many segments were orange even red in DCM group. In DCM group, the value of Ts showed significantly longer than that of the control group (P<0.05). There were left ventricular delay of Ts in a total of 16 cases and 85 (44.27%) segments, among which significant delay were evident in 17 (20.00%) segments of five cases (Ts>300ms). Ts-SD of left ventricular were (82.3 ± 34.48) ms and Ts-12 were (176.56 ± 77.90) ms, which were significantly longer than that of the control group (P<0.05). The Ts-SD were more than 34.4ms in 14 (87.50%) cases and the Ts-12 more than 100ms in 15 (93.75%) cases in DCM group.
Conclusions Regional myocardial dyssynchrony contraction of left ventricular in children with DCM presented frequently, which could be accurately assessed by TSI.

P2.
Effects of histone acetylated modification on MSCs differentiation into cardiomyocytes
Li Li, Zhu Jing, Feng Chuan, Lv Wei, Wei Tian, Jie Jin
The Department of Cardiology, Children’s Hospital, Chongqing Medical University

Purpose The aim of this study is to explore the effects of histone acetylated modification in regulating MSCs differentiation into cardiomyocytes in myocardium microenvironment by detecting the acetylation activities, the expression level of histone acetylation gene(HDAC5) and specific myocardial development gene(GATA4) within the myocardium tissues transplanted with MSCs transfected by plasmid Z33.
Methods Abtract the successfully constructed shRNA(Z33) and transfer it into MSCs for 24hours. Transplant the MSCs transfected by plasmid Z33 into the rat myocardium and detect the expression of acetylation activity, HDAC5 and GATA4 after two weeks of MSCs transplantation.
Results The acetylation activity of experiment group is significantly lower than all control groups, the expression level of HDAC5 and GATA4 in myocardium of experiment group has significant reduction compared to the control groups.
Conclusion Inhibitory state of histone acetylation can inhibit the transcription process even in the myocardium microenvironment. The result establishes foundation for research on histone acetylation in the function of regulating MSCs differentiation into cardiomyocytes.

P3.
Preoperative Management Strategy for Patients with Transposition of the Great Arteries and Intact Ventricular Septum
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Purpose: This study is designed to assess the preoperative management strategy for patients with transposition of the great arteries and intact ventricular septum(TGA-IVS).
Methods: Twenty eight patients who confirmed with TGA-IVS were reviewed. We analyzed their clinical characteristics, diagnosis evidences, preoperative management and outcome, mortality rate and the complication incidence before surgical operation.
Results: There were 19 boys and 9 girls in this group, had mean gestational age of 38.5 weeks and birth weight of 3.24kg. 7 cases (25%) were prenatal diagnosis, while the remaining 21 cases were postnatal diagnosis at the mean age of 45 hours. The karyotype was normal and no extracardiac anomalies. Cyanosis is the most common and critical characterization been noticed. diagnosis generally can be confirmed by echocardiography. All patients received prostaglandin E1 (PGE1) infusion once highly suspected or confirmed with TGA-IVS, 25 of them (89%) can effectively maintain the patency of the ductus arteriosus preoperative. Balloon atrial septostomy (BAS) was performed successfully in all cases at the mean age of 21 hours, as judged by oxygen saturation increased from (56 ±20)% before BAS to (82 ± 10)% after BAS, P<0.05. Both preoperative mortality and serious morbidity were 3.5%.
Conclusions: All cases in our group managed with PGE1, and BAS preoperative, which was safe and effective, may dramatically improve oxygenation, reduced preoperative mortality and morbidity, supported life until definitive surgery can be performed.
P4. Value of Cardiovascular Imaging Methods on Diagnosis of Complex Congenital Heart Disease Evaluated by ROC Analysis

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Department of Pediatric Cardiology, Shanghai Children's Medical Center, Medical College of Shanghai Jiaotong University, Shanghai 200022

Purpose: This study aimed to evaluate the value of cardiovascular imaging methods in the diagnosis of pathologic morphology of complex congenital heart disease (CHD) in children using receiver operating characteristic (ROC) analysis.

Methods: Twenty-eight patients with complex CHD were respectively diagnosed by three clinical-data blinded cardiologists with two-dimensional echocardiography (2DE), real-time three-dimensional echocardiography (RT-3DE), magnetic resonance imaging (MRI) and multi-slice spiral computed tomography (CT), and digital subtraction angiography (DSA). The diagnostic results of the imaging methods in the pathologic morphology of complex CHD including cardiac malformations in the three levels of atria, ventricles and great arteries, atrial-ventricular and ventricular-arterial continuity, and extracardiac vascular malformations, etc. were compared with surgical findings which was used as “Gold Standard”, and evaluated by ROC analysis using a five-point categorical scale that ranged from definitely abnormal to definitely normal.

Results: The diagnostic assessments of the imaging methods were grouped and further analyzed by ROC curve and their areas under ROC curves. From our findings, in the intracardiac malformations, atrial-ventricular and ventricular-arterial continuities, ROC curve for RT-3DE was located left-superior to that for 2DE, MRI/CT, DSA. And the area under ROC curve for RT-3DE (0.95) was higher than that for 2DE (0.92), MRI/CT (0.91), DSA (0.89). There was significant difference by the method of Z-test between RT-3DE and 2DE (Z=2.30, two-sided P<0.0215), RT-3DE and MRI/CT (Z=2.80, two-sided P=0.0050), RT-3DE and DSA (Z=3.18, two-sided P=0.0015). Thus, left-superior ROC curve for RT-3DE and the larger area under ROC curve for RT-3DE were closer to the ideal discrimination function than that for 2DE, MRI/CT, DSA (P<0.05). While in the extracardiac vascular malformations, ROC curve for DSA was located left-superior to that for MRI/CT, 2DE. And the area under ROC curve for DSA (0.99) was higher than that for MRI/CT (A=0.98), 2DE (0.92), DSA (A=0.89). There was significant difference between DSA and 2DE (Z=2.67, two-sided P<0.0075), but non-significant difference between DSA and MRI/CT (Z=1.52, two-sided P=0.1292).

Conclusion: ROC analysis showed that 2DE and RT-3DE have the advantages in displaying intracardiac structures, especially RT-3DE which could provide more spatial cardiac portrayal, while DSA, MRI and multi-slice spiral CT have the advantages in displaying extracardiac structures, MRI and multi-slice spiral CT may replace angiography to some extent.

P5. Echocardiographic Diagnosis of Anomalous Origin of the Left Coronary Artery From the Pulmonary Artery in 24 Cases

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Department of Pediatric Cardiology, Shanghai Children’s Medical Center affiliated to Shanghai Jiaotong University, Shanghai 200022, China

Background: Anomalous origin of the left coronary artery from the pulmonary artery (ALCAPA) is a very rare type of congenital heart defects with an incidence of 1/300,000 in newborns. Echocardiogram has played a predominant role in its diagnosis, but the diagnostic accuracy remains experience dependent clinically.

Purpose: To investigate the diagnostic methods and echocardiographic features of ALCAPA in pediatric patients.

Methods: A total of 24 cases of ALCAPA hospitalized between 1998 and 2007 were found in the database of Shanghai Children’s Medical Center and divided into two groups according to their age at hospitalization: infant group (age <1Y, n=12) and older children group (age≥1Y, n=12). The following echocardiographic features were analyzed: (1) Continuity of the left coronary artery (LCA) and the pulmonary artery (PA), (2) Retrograde shunt from LCA to PA through LCA, (3) Increased papillary muscle echodensity of the left ventricle (LV), (4) Right coronary artery (RCA) dilation, (5) Collateral signals within the ventricular wall and septum, (6) LV enlargement, (7) Degree of mitral regurgitation (MR), (8) LV function.

Results: 21 cases (88%) were diagnosed by echocardiogram and 18 of them (73%) were diagnosed by the first time of examination. The presence of retrograde shunt from LCA into PA (21/24), anterior lateral papillary echogenic (19/24) and collateral vessel signals within the ventricular septum (18/24) were high in both groups (P<0.05). The presence of RCA dilation was significantly lower in the infant group (4/12) than in the older children group (11/12) (P=0.05). An enlarged LV was measured in all patients but its degree was less obvious in the older children group than in the infant group (P<0.05). Cardiac dysfunction was explored in all infant patients while none were found in the older children patients (P=0.05). MR degree was mild in the majority of patients and no significant difference was found between the two groups (P=0.05).

Conclusion: Infant and older children patients could demonstrate different features in echocardiography. However, retrograde shunt from LCA into PA, anterior lateral papillary echogenic and intercoronary collateral signals were important clues at any age of pediatric patients. Careful echocardiography is able to diagnose ALCAPA accurately.
ABSTRACTS

Abstracts for Poster Session:

P6.
3DE for patient selection in transcatheter closure of ASD
Hong wenjieing Sun kun Gao wei Zhang yaqi Wu lanping. Department of Pediatric Cardiology, Shanghai Children's Medical Center affiliated to Shanghai Jiaotong University, Shanghai 200127, China.

Purpose: Atrial septal defect (ASD) is a common form of congenital heart disease in children. Percutaneous closure of secundum ASD with Amplatzer septal occluder (ASO) has shown to be a safe and efficient alternative to surgery. The purpose of this study is to evaluate the value of three-dimensional echocardiography (3DE) in the procedure of transcatheter closure of ASD.

Methods: 3DE studies were performed on 54 patients with ASD before percutaneous occlusion. The device was successfully implanted in 52 cases (group A) and failed in 2 cases (group B). The size and area of ASD in group A measured by 3DE were compared with the actual selected size of the device. Furthermore, the 3DE parameters of ASD in two groups included the diameters of short and long axis, areas of ASD, spatial distances from ASD to adjacent cardiac structures, left atrial volume(LAV), right atrial volume(RAV), LAV/Area of ASD, RAV/Area of ASD, LAV/long axis of ASD and RV/long axis of ASD were compared and analysed to explore the risk factor of failure implantation of device during the procedure retrospective.

Results: 3DE could display the defects in all 54 patients. No significant difference between the values of long axis area of ASD measured by 3DE and the exact diameter and area of chosen ASO (P>0.05) in group A. All of the parameters in group B were within the 95% normal range in group A except LAV/Area of ASD and LAV/long axis of ASD Ratio measured by 3DE.

Conclusion: The 3DE measured diameter and area of ASD can be used for the selection of the size of ASO for transcatheter occlusion of ASD. The LAV/Area of ASD and LAV/long axis of ASD Ratio measured by 3DE might be very useful parameters for selection of the optimal candidate for transcatheter occlusion of ASD.

P7.
The Diagnostic Protocol in Children and Adolescents with Syncope—A Multi-Center Prospective Study
Du Junbao on behalf of The Group of The National Tenth Five-year Plan Research Project of China. Department of Pediatrics, Peking University First Hospital, Beijing

Purpose: The appropriate diagnostic protocol for children with syncope has not been well established. The present study was undertaken to develop a diagnostic protocol for Chinese children with syncope and was developed and prospectively implemented to improve the diagnostic performance of pediatricians.

Methods: The study population included 474 consecutive patients (212 males, range 6-17 years) presenting with a syncopal spell in one of the five participating hospitals of China. In step 1, all patients underwent initial evaluation for history, physical examination, standing test and standard electrocardiography (ECG). In step 2, priority was given to cardiographic tests for possibly cardiac syncope, or electroencephalographic examination and brain imaging for suspected neurological syncope, or psychiatric tests for suspected psychiatric syncope. Patients with unexplained syncope underwent head-up tilt testing (HUT) alone or poteminated with nitroglycerine.

Results: The initial evaluation gave a definite diagnosis in 59 (12.4%) and possible diagnosis in 54 of the 474 patients. Further testing gave a definite diagnosis for 276 patients (69.7%). After the entire diagnostic protocol, definite diagnosis was established in 385 patients (81.1%). Autonomic-mediated reflex syncope accounted for 73.0% of cases. The cost of diagnostic results per patient was $103.24 ± 415.09.

Conclusion: The use of a simplified diagnostic protocol for children and adolescents with syncope improves diagnostic yield.

P8.
Clinical analysis of noncompaction of ventricular myocardium in children: a report of 2 cases
CHEN Guozi
Department of Paediatric Cardiology, the first affiliated Hospital of SunYat-sen University, Guangzhou, China.

Purpose: To describe characteristics and outcome in children with noncompaction of ventricular myocardium(NVM) and to improve the knowledge on it.

Methods: 2 patients were reported and their occurrence, clinical manifestations, electrocardiogram, echocardiograph and follow-ups were studied.

Results: 2 cases were male. They all developed myocardial ischemia and kinds of arrhythmias demonstrated on electrocardiogram which had atrial fibrillation, atrial flutter, paroxysmal ventricular tachycardia, paroxysmal supraventricular tachycardia, and atrio-ventricular block. Echocardiographic examinations showed that numerous prominent trabuculations and deep intertrabecular recesses were presented in ventricle. Typically forward and reversed flow between prominent trabuculations were discovered by Color Doppler Flow Image(CDFI) during the cardiac cycle. Follow-up were 3 years, cardiac function improved in one case, another was died.

Conclusion: NVM in children is accompanied by depressed ventricular function and kinds of arrhythmias. Early diagnosis and treatment without delay are critical to improve prognosis.
P9.
Value of transthoracic echocardiography in transcatheter closure of patent ductus arteriosus
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Purpose To explore the practical value of transthoracic echocardiography (TTE) in
transcatheter closure of patent ductus arteriosus (PDA) using duct occluder.

Methods Seventy-six patients with PDA underwent TTE study. The location, the diameter,
the length and the pattern of PDA were observed, and the therapeutic effect was assessed. The
left ventricular end-diastolic diameter (LVEDD), left ventricular end-systolic diameter
(LVESD), left ventricular ejection fraction (LVEF) and left ventricular fractional shortening
(LVFS) were measured.

Results The diameter of PDA measured by TTE was (4.3±1.6) mm, and by aortic
angiography was (3.7±2.2) mm. These diameter measurements showed excellent correlation (r
= 0.87, P < 0.01). On a follow-up of three days, three months and one year, the occluders
were in position and none of them displaced and fell off. Six cases had small residual shunt and
disappeared at the third months after operation. The LVEDD, LVESD were significantly
reduced after closure and continuously reduced during 3~12month follow-up. The LVEF and
LVFS were lower after closure than before, while no evident difference was found between
early TTE examination after closure and during 3~12months follow-up.

Conclusion TTE plays an important role in select in gratients and evaluating the efficiency
of PDA occlusion.