

ABSTRACTS

Abstracts for Free Paper Session:

PERCUTANEOUS CORONARY INTERVENTION I

1.

Stent Strut Fracture after the implantation of Drug Eluting Stent: a single center experience.

Chee W. Wu, Chun L. Lau, Ngai Y. Chan, Ping T. Tsui, Ngai S. Mok and Ying K. Lo
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Objective: To study the clinical characteristics and the mode of management of cases of stent strut fractures (SSF) after Drug Eluting Stents implantation in Princess Margaret Hospital.

Method: Cases of fracture of Drug Eluting Stent fractures were collected from operators in Princess Margaret Hospital. Their clinical records, images from coronary angiogram, IVUS and CT were reviewed.

Results: 10 SSF were detected in 7 stents among 5 patients. All fracture stents were Sirolimus Eluting Stents. 80% of the patients were male. 2 patients had SSF over RCA, 1 patient over LCX and 2 patients over LAD. 1 patient had 4 SSF over 2 overlapping stents in LAD, while 1 patient had 2 fractures over his stent in RCA. The average total length of stents used over the site of fracture was 53.8 \pm 28.8mm (range 23-96mm). The diameter of stents involved were 2.5mm in 2 stents, 2.75mm in 2 stents, 3.0mm in 1 stent and 3.5mm in 1 stent. Among the 10 SSF, only 4 of them (40%) have more than 50% stenosis at the time of first detection, the mean time from stent implantation to first detection of SSF was 19 months (range 2-52 months). All the 5 patients received Target vessel revascularization (TVR). The decision for TVR was made in 3 patients at the time of first detection of SSF, the other 2 received TVR after repeat coronary angiogram showed disease progression. For the mode of TVR, 4 of the patients had Percutaneous Coronary Intervention (PCI) and 1 had Coronary Artery Bypass Surgery. Among the 4 patients with PCI, 1 patient had 2 attempts of PCI with both of them failed because of failure of wire penetration, PCI in the other 3 patients were successful with Everolimus Eluting Stents implanted in 2 patients and Zotarolimus Eluting Stents implanted in 1 patient.

Conclusion: Fracture stent is observed in a significant number of patients after Sirolimus Eluting Stent implantation. TVR is frequently required.

2.

Clinical outcomes after stenting of unprotected left main coronary artery stenosis in a regional hospital

John T Wong, CK Chan, CS Yue

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Introduction -Significant unprotected left main stem coronary artery (ULMCA) disease treated medically have a 3-year mortality of 50%, and coronary artery bypass graft (CABG) is the cornerstone of treatment for these patients. Increasing data had demonstrated the safety and feasibility of ULMCA using percutaneous coronary intervention (PCI). This study aims to evaluate the clinical outcome of patients undergoing PCI to ULMCA disease in a regional hospital.

Method- All patients who had undergone PCI to ULMCA in United Christian Hospital (UCH) during Jun 2007 - Jan 2009 were included for analysis.

Results - A total of 718 cases of PCI were performed in UCH during the above period. In 25 (3.5%) of these cases the target lesion involved ULMCA. The mean age of patients whom had PCI to ULMCA was 70.8 \pm 7.5 years and most of them (60%) were males. Their mean ejection fraction was 50%. Distal ULMCA was affected in 92% of cases, while the rest affected either the ostium or the shaft. Immediate procedural success rate was 100%. The majority of cases had utilized drug-eluting stents (DESs) (72%); the rest had non-DES for their ULMCA PCIs. All ULMCA PCIs performed were to de novo ULMCA lesions except 3 in-stent restenosis (ISR) cases. Intravascular ultrasound and prophylactic intra-aortic balloon pump was used in 84% and 8% of patients respectively. One patient required rotational atherectomy. In distal ULMCA disease group, 78% had single stent and the rest had 2 stents implanted mainly using T-stenting strategy, and kissing balloon was performed in 48% of cases. Mean ULMCA stent size was 3.58 \pm 0.43mm in diameter and 19 \pm 7.1mm in length. At a mean follow-up time of 232 \pm 176 days, non cardiac death occurred in 1 patient (4%), 2 had recurrent non Q wave myocardial infarction (8%) and 2 had target lesion revascularization (8%) due to ISR using non-DES. There was no occurrence of stroke or stent thrombosis in this study population.

Conclusion - ULMCA stenting provided excellent immediate procedural success rate and mid term results in this selected population. These findings suggested that PCI may be considered as a safe and effective alternative to surgery for relatively low risk patients with ULMCA disease in our hospital.

3.

Angiographic follow-up of Everolimus-eluting stents in Unprotected Left Main intervention

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Purpose: To review the safety and efficacy of everolimus-eluting stents in unprotected left main intervention.

Methods: Retrospective case series analysis. **Results:** Ten (8 males, 2 females) patients of mean \pm sd age of 64 \pm 7 were recruited after screening 247 consecutive patients implanted with 427 everolimus-eluting stents. All patients preferred percutaneous coronary intervention to surgery. Provisional T-stenting with minimal protrusion was the strategy in 8 patients with true bifurcation lesions. Three patients required side branch (left circumflex) stenting. One patient had implantation of kissing stents. One patient had ostial left main stenting. Intravascular ultrasonography and high pressure post-dilatation were routinely performed. Final kissing balloon dilatation was performed in 8. All patients survive to-date and have had no major adverse cardiac events. Angiographic follow-up within one year was performed in all patients. Minimal intimal growth and no significant in-stent restenosis were noted. **Conclusion:** Initial experience of everolimus-eluting stents in unprotected left main intervention appeared safe with no significant angiographic restenosis.

Sex/Age	Bifurcation, Remark	1 or 2 stents	Final Kissing
M/67	YES	4.0x18	YES
M/51	YES	3.5x18, 2.75x12	YES
F/74	YES, ISR	3.0x28, 2.75x15	YES
M/59	YES, ISR	3.5x28	YES
M/73	YES, ISR	3.0x18	NO
M/63	NO	4.0x12	NO
M/67	YES	3.5x18	YES
M/59	YES	4.0x28, 3.0x12	YES
M/61	YES, CTO	3.5x18	YES
F/68	YES	3.5x23, 3.0x23	YES

4.

Clinical Outcomes of Patients with Bare Metal in-stent Restenosis treated with Drug Eluting Stents

RCY Fung, CS Yue, CK Chan

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Purpose: The aim of this study was to evaluate the medium term outcome of patients with bare metal in-stent restenosis treated with drug eluting stents (DES).

Methods: Patients who had coronary angiogram performed in the United Christian Hospital between 1 Jan 2006 and 31 Dec 2008 were included. Demographic data was retrieved from our clinical records and percutaneous coronary intervention registry. Patients' baseline parameters including age, gender, previous history of cardiovascular disease, comorbidities including diabetes mellitus, hypertension, hyperlipidaemia, peripheral vascular disease and renal impairment were collected. Data regarding their clinical outcomes were retrieved from the computer based clinical record. Major adverse cardiac events were defined as mortality, target lesion revascularization (TVR) and myocardial infarction.

Results: A total of 47 patients diagnosed with in-stent restenosis were treated with drug eluting stents. There were 11 (23.4%) focal, 26 (55.3%) diffuse, 3 (6.4%) proliferative and 7 (14.9%) total in-stent restenosis. Twenty six patients (55.3%) were male and the others were female. Their mean age was 66.7 \pm 11.0. Intravascular ultrasound was used in 40 cases (85.1%). The mean original stent size and length were 2.9 \pm 0.5mm and 28.8 \pm 12.3mm respectively. The mean subsequently implanted DES size and length were 3.1 \pm 0.5mm and 34.0 \pm 17.0mm respectively. During a mean follow up of 31.7 \pm 11.2 months, there were 3 deaths (6.3%, 2 cardiac and 1 non-cardiac). Univariate analysis showed that peripheral vascular disease (p=0.046), renal failure (p<0.001) and an ejection fraction below 35% (p=0.039) were associated with higher mortality. Six patients had (12.8%) non-fatal myocardial infarction and two had (4.3%) target lesion revascularization. There was no stent thrombosis.

Conclusion: During medium term follow up, the treatment of bare metal in-stent restenosis with drug eluting stents is safe and appears promising. Long term outcome remains to be evaluated.

ABSTRACTS

Abstracts for Free Paper Session:

5.

Cost Effectiveness of Drug-eluting Stent in Hong Kong – A Single Centre “Real World” ExperienceVivian W.Y. Lee¹, Bryan P. Yan², C.Y. Chan¹, C.W. Mak¹, C.M. Yu²¹School of Pharmacy, ²Division of Cardiology, Department of Medicine and Therapeutics, The Chinese University of Hong Kong

Background: Percutaneous coronary intervention (PCI) with bare-metal stent (BMS) is limited by restenosis. The effectiveness of drug-eluting stents (DES) in reducing restenosis and the need for repeat revascularization in selected patients has been demonstrated by the randomized controlled trials. However, the initial cost of DES is much higher than BMS and there is little data on the cost effectiveness of DES in Hong Kong practice. We aimed to evaluate the cost-effectiveness of DES in a Chinese population.

Method: It was a retrospective cross-sectional study. We included 558 consecutive patients who underwent PCI with stent placement in a tertiary public hospital in Hong Kong during January to December 2005. Clinical outcomes were over a 1-year follow-up period including cardiac death, non-fatal myocardial infarction, target lesion revascularization. Direct medical costs were estimated based on the procedural cost, hospitalization, medications, cardiac follow-up and repeated interventions taken. Cost effectiveness was defined as the incremental cost effective ratio (ICER) per target lesion revascularization (TLR) avoided and quality adjusted life year (QALY) gained.

Results: Twelve-month TLR was 5.4% in BMS versus 2.0% in DES ($p=0.03$), the mean cost difference of instrument in index procedure was also statistically significantly higher in DES over BMS (difference = HK \$ 14,922; $p < 0.0005$). However, the cost of follow up and repeated intervention was higher in BMS group which offset the overall 12-month cost post stent placement. The cost difference was HK\$ 2,749 between DES over BMS in the first 12-month after stent placement. The ICER for DES compared with BMS was HK\$7,872 per repeat revascularization avoided. The cost-utility ratio for DES was < HK\$ 30,000 per QALY gained compared with BMS.

Conclusion: In this cohort, DES demonstrated a significant reduction in 12-month TLR compared with BMS. Although DES carried a higher initial procedural cost, it had similar 12-month costs with BMS due to less repeat intervention. Our study suggests that treatment with DES was a cost-effective strategy compared to BMS in a Hong Kong public hospital.

7.

Initial Experience in the use of ASAHI Sheathless Eaucath in transradial percutaneous coronary intervention in Chinese patients

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Background: Transradial percutaneous coronary intervention (PCI) is safe, with low risk of complications. However, its applicability may be limited in patients with small radial artery; especially those with small body build (Chinese patients). And the risk of complication may be higher in this group of patients. Use of 5F guiding catheter may help to lower the risk of complication, but it may not be applicable in patients with complex coronary artery disease. Use of ASAHI Sheathless Eaucath may improve the applicability of transradial PCI in Chinese patients, and lower the risk of complications.

Objective: To assess the applicability of ASAHI Sheathless Eaucath in Chinese patients undergoing transradial PCI

Methods and Results: Patients undergoing transradial PCI with ASAHI Sheathless Eaucath under a single operator were prospectively analysed. A total of 32 patients underwent PCI with ASAHI Sheathless Eaucath, 62% were male with mean age of 65.6 ± 10 yrs. Their mean height and body weight were 162 ± 7.3 cm and 62.7 ± 9.46 kg respectively. Procedure success was 100%. 6.5 F Guiding sheaths were used in 31 cases, and 7.5 F Guiding sheath was used on once case of complex bifurcation disease. JL3.5/4 Guiding sheaths were used in left sided cannulation in all cases (26/26). JR 3.5/4 Guiding sheaths were used in 6/10 cases of right sided cannulation, whereas JL guiding sheaths were used in 3 patients with multivessel diseases, with the JL guiding sheath used for bilateral cannulation of both LM and RCA. AR guiding sheath was used in one case. Most of them (77%) have single vessel disease, with total of 43 lesions treated and 40 stents implanted. Most of them were type B lesions ($n=36$), with 1 type A lesion, and 6 type C lesions. There was no procedure related MACE and no access site complication (i.e., haematoma). Most of the patients ($N=29$) has strong radial pulse on follow-up.

Conclusions: In our initial experience, transradial PCI with ASAHI Sheathless Eaucath was feasible in selected Chinese patients with no complication.

6.

Angiographic Outcome after Adjunctive Aspiration Thrombectomy in Selected Case of Primary Angioplasty

CK Chan, RCY Fung, J Wong, KF Leung, CS Yue, Division of Cardiology, Department of Medicine and Geriatrics, United Christian Hospital, HKSAR

Background and objective: Patients who develop slow-flow or no-reflow during primary percutaneous coronary intervention (PCI) for acute myocardial infarction (AMI) are associated with less favorable clinical outcomes. Recent studies have identified some angiographic morphologic features of heavy thrombus burden that may predict no-reflow. However, the benefits of adjunctive mechanical devices to prevent distal embolization in patients with AMI are still a matter of debate when they are used in a non-selective all-comer basis. We sought to review the angiographic outcomes in our cohort of AMI cases that have been treated with selective use of aspiration thrombectomy.

Method: Based on previously published study, we defined high thrombus burden in the following way. Assessment of thrombus load was made only after wire crossing. The presence of the followings were defined as having high thrombus load: 1) abrupt cut-off pattern of occlusion, 2) accumulated thrombus (> 5 mm) proximal to the occlusion, 3) presence of floating thrombus, or 4) persistent dye stasis distal to the obstruction. The presence of the above would mandate the use of adjunctive aspiration thrombectomy which was then followed by routine PCI procedures.

Results: From 1-2008 to 2-2009, there were 32 primary PCI cases. 10 patients (31.2%) were judged to have high thrombus load. Mean age was 61.5 year-old with 80% male. DM, HT, hypercholesterolemia were present in 40%, 40% and 70% of the subjects. Coronary arteries involved were 70% RCA and 30% LAD. Successful aspiration was performed in all patients using the Export Catheter (Medtronic) or Thrombuster II (Kaneka) and visible, sizable thrombus was retrieved in 80%. Mean stent diameter and length used were 3.25 mm and 23.3 mm. 2b3a receptor antagonist was used in 40% and additional filter devices were used in 20%. Acute procedure success was 100% and TIMI 3 flow was achieved in all patients.

Conclusion: Selective use of adjunctive aspiration thrombectomy in our cohort of AMI patients, who otherwise were at high risk of distal embolization, produces excellent angiographic outcomes. Manual thrombectomy is inexpensive and user-friendly and thus represents an attractive strategy.

8.

Percutaneous atrial septal defect closure in patient with severe pulmonary hypertension- Is it a feasible option?

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Objective: To review the outcomes in patients with severe pulmonary arterial hypertension (PAH) undergoing percutaneous atrial septal defect (ASD) closure.

Methods: This is a retrospective case review of patients with secundum ASD and severe PAH undergoing transcatheter closure in Queen Elizabeth Hospital between 2004 and 2006. Patients with severe PAH, as defined by right ventricular systolic pressure (RVSP) ≥ 60 mmHg, were identified by echocardiography. They subsequently had catheter studies where shunt ratios, pulmonary vascular resistance index (PVRI) and reversibility of pulmonary vascularity after balloon occlusion and intravenous nitride and oxygen were tested. Patients were then subject to a treatment period of 6 weeks with either amiodipine or sildenafil prior to closure with an Amplatzer device. All patients received long-term vasodilator after closure. Follow-up echocardiograms were arranged for the evaluation of RVSP.

Results:

Patient	ASD Size(cm)	Qp:Qs	PVRI baseline (WU.m ²)	PVRI balloon occlusion + vasodilator (WU.m ²)	RVSP baseline (mmHg)	RVSP post-closure (mmHg)
1 (f25)	2	1.47	18.4	5.97	90	40
2 (m27)	2.9	1.65	23.8	7.6	95	48
3 (f33)	2.2	1.67	13.8	8.26	85	46
4 (f58)	4	1.53	15	5.37	107	106

There were four patient with secundum ASD and severe PAH of which three were female and one was male. The mean age was 36 (range 22-58). The mean ASD size was 28 ± 0.1 mm (range 20-40). The mean shunt ratio (Qp:Qs) was 1.58 ± 0.09 . The mean PVRI at baseline during catheter study was 17.75 ± 4.48 WU.m². After sizing balloon occlusion and vasodilator test the mean PVRI was 6.8 ± 1.35 WU.m². ($p=0.008$) The mean RVSP at baseline was 94 ± 9.43 mmHg. After device closure it was reduced to 60 ± 30.85 mmHg. ($p=0.028$)

Conclusion: In the past, the presence of severe PAH had previously been regarded as a relative contraindication for surgical closure. With recent advances in medical treatment and catheter-base techniques, improvement of RVSP could be seen in patients with severe PAH after transcatheter closure of secundum ASD. Even though continue reduction of RVSP was noted in most of the patients, total normalization was not demonstrable. Improvement of PAH after closure appeared to be more beneficial in the younger age group, in spite of positive pulmonary vasodilator response on initial catheter studies.

ABSTRACTS

Abstracts for Free Paper Session:

9.

Validation of the Mayo Clinic Risk Score for In-hospital Complications after Percutaneous Coronary Intervention in the Drug-eluting Stent Era using a Large Australian Interventional Registry

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Purpose: The Mayo Clinic Risk Score (MCRS) has 7 pre-procedural clinical variables (age, creatinine, ejection fraction, myocardial infarction (MI) ≤ 24 hours, shock, peripheral vascular disease (PVD) and heart failure) which have been validated to predict cardiovascular complications after percutaneous coronary intervention (PCI). External validation using an independent data set in the drug-eluting stent era is lacking.

Methods: We assessed the ability of the MCRS to predict in-hospital mortality and MACE (death, MI, stroke, unplanned revascularization) among 10,536 consecutive PCIs between April 2004 and December 2008. Discrimination ability of MCRS as a predictor of mortality and MACE was assessed using receiver operating characteristics (ROC) curves.

Results: The cohort was predominantly male (74.8%) with a mean age of 64.6 ± 12 years. Co-morbidities included diabetes mellitus (24.2%), heart failure (5.0%) with mean ejection fraction of $54 \pm 12\%$, renal impairment (4.3%) and PVD (7.0%). Presentation with MI ≤ 24 hours and shock were 23.6% and 2.35%, respectively. Drug-eluting stent was used in 44.1% of cases. Correlation between MCRS and in-hospital mortality was moderate ($r=0.52$), but its discriminatory ability to predict in-hospital mortality was high (area under ROC=0.93, 95%CI 0.91-0.96), and was maintained among subgroups. The correlation between MCRS with MACE ($r=0.36$) and its ability to predict MACE (0.73, 95%CI 0.70-0.76) was lower.

Conclusions: A risk-scoring-system based on 7 clinical variables appears to accurately predict cardiovascular complications after PCI in this Australian cohort. This model may be useful for providing patients with individualized, evidence-based estimates of procedural risk as part of the informed consent process prior to PCI.

ABSTRACTS

Abstracts for Free Paper Session:

HYPERTENSION AND HYPERLIPIDEMIA

10.

A single nucleotide polymorphism in the *APOA5* gene is a major determinant of plasma triglyceride levels in Hong Kong and Guangzhou ChineseC.Q. Jiang¹, B. Liu¹, J.M. Lin¹, X.J. Yue¹, K.L. Ong², S. Tam³, K.S. Wong⁴, B. Tomlinson⁴, K.S.L. Lam², T.H. Lam⁵, G.N. Thomas⁶, B.M.Y. Cheung⁷¹Guangzhou no. 12 Hospital, Guangzhou, China, ²University of Hong Kong, Department of Medicine, Hong Kong, China, ³Queen Mary Hospital, Department of Clinical Biochemistry, Hong Kong, China, ⁴Chinese University of Hong Kong, Department of Medicine and Therapeutics, Hong Kong, China, ⁵University of Hong Kong, Department of Community Medicine, Hong Kong, China, ⁶University of Birmingham, Department of Public Health and Epidemiology, Birmingham, United Kingdom, ⁷University of Birmingham, Department of Clinical Pharmacology, Birmingham, United Kingdom**Purpose:** Single nucleotide polymorphisms (SNPs) in the apolipoprotein A5 (*APOA5*) gene have been associated with hypertriglyceridemia. We investigated which of the SNPs in the *APOA5* gene were associated with triglyceride levels in two independent Chinese populations.**Methods:** Five tagging SNPs were chosen from the database in HapMap on Han Chinese and the genotypes were determined in 1375 unrelated subjects in the Hong Kong Cardiovascular Risk Factor Prevalence Study. Replication of the findings was sought in 1996 subjects from the Guangzhou Biobank Cohort Study. The main outcome measure was plasma triglycerides.**Results:** Among the five tagging SNPs, rs662799 (-1131T>C) was most strongly related to log-transformed triglyceride levels among Hong Kong subjects ($\beta = 0.192$, $P = 2.63 \times 10^{-13}$). Subjects with CC genotype had 36.1% higher plasma triglycerides than those with TT genotype in Hong Kong. This association was confirmed in Guangzhou subjects ($\beta = 0.159$, $P = 1.25 \times 10^{-12}$), and was significant irrespective of sex, age group, obesity, metabolic syndrome, hypertension, diabetes, smoking, and alcohol drinking. The odds ratio for plasma triglycerides ≥ 1.7 mmol/L associated with the genotype TC and CC was, respectively, 1.81 (1.37-2.39) and 2.22 (1.44-3.43) in Hong Kong subjects and 1.27 (1.05-1.54) and 1.97 (1.42-2.73) in Guangzhou subjects. Haplotype analysis suggested the association was due to rs662799, without any significant contribution from other tagging SNPs.**Conclusion:** The corroborative findings in two independent populations indicate that the -1131T>C polymorphism in the *APOA5* gene is an important and clinically-relevant determinant of plasma triglyceride levels in Chinese.

11.

Effects of polymorphisms in liver uptake transporter *SLCO1B1* on the lipid response to rosuvastatin in Chinese patients with hypercholesterolaemiaMiao Hu¹, Valiant WL Mak¹, Emily WM Poon¹, Tanya TW Chu¹, Teresa KC Tsui², Vivian WY Lee³, Larry Baum⁴, & Brian Tomlinson¹¹Department of Medicine & Therapeutics, ²Department of Chemical Pathology, ³School of Pharmacy, The Chinese University of Hong Kong, Hong Kong SAR.**Introduction:** There is considerable variation between individuals in plasma lipid responses to statins, the cause for which is largely unknown. The organic anion transporter polypeptide (OATP1B1, *SLCO1B1*), influences plasma and hepatic disposition of most statins and has been found to be the major genetic determinant of simvastatin myotoxicity. This study was performed to examine the effects of some common single nucleotide polymorphisms (SNPs) in *SLCO1B1* on the lipid response to rosuvastatin.**Methods:** Chinese patients with hypercholesterolaemia and increased cardiovascular risk treated with rosuvastatin 10 mg daily for at least 4 weeks were genotyped for 8 SNPs in *SLCO1B1*: -11187G>A, 388A>G, 521T>C, 571T>C, 597C>T, 44205C>A, 42279T>G and 94024G>C.**Results:** In 213 unrelated patients with self-reported good compliance (101 male; 86 with familial hypercholesterolaemia [FH]) and mean (\pm SD) age 57.6 ± 11.2 years, rosuvastatin was well tolerated with no adverse effect. There were reductions ($p < 0.001$) in total cholesterol ($-38.7 \pm 8.9\%$), LDL-C ($-52.7 \pm 11.9\%$) and triglycerides ($-23.2 \pm 27.0\%$) and a small increase ($p < 0.05$) in HDL-C of $1.9 \pm 12.4\%$. Five SNPs in *SLCO1B1* were found to influence HDL-C response on univariate analysis, but in the multiple regression analysis 94024G>C (rs4149080) was the only SNP to be significantly associated with percentage increase in HDL-cholesterol after adjustment for other variables. Patients with GG genotype had greater increase in HDL-C compared to those with GC or CC genotypes (3.8 % vs. 2.6 % vs. -2.9 %, $P = 0.014$). None of the SNPs was found to affect the LDL-C response or triglyceride response.**Conclusions:** We identified a single SNP in intron 13 of the *SLCO1B1* gene associated with HDL-C response to rosuvastatin in Chinese subjects. It is still unclear whether this polymorphism is functional or in linkage disequilibrium with other SNPs that may affect transporter activity, which warrants further investigation.

12.

Effects of Polymorphism in Hepatic Uptake Transporter *SLCO1B1* on Lipid Responses to SimvastatinVWL Mak¹, M Hu¹, TTW Chu¹, VWY Lee², T Tsui³ & B Tomlinson¹¹Department of Medicine & Therapeutics, ²School of Pharmacy, Faculty of Medicine, ³Department of Chemical Pathology, The Chinese University of Hong Kong, Shatin, Hong Kong SAR**Introduction:** The membrane transporter organic anion transporter polypeptide OATP1B1 (gene *SLCO1B1*) is important in the uptake of hydrophilic statins to their site of action in hepatocytes. Certain common single nucleotide polymorphisms (SNPs) result in altered activity of OATP1B1. Simvastatin acid, the active form of simvastatin, is a substrate of OATP1B1. We investigated the relationship of *SLCO1B1* SNPs on lipid lowering responses.**Method:** Chinese patients with high cardiovascular risk were treated with simvastatin 40 mg daily for at least 6 weeks. They were genotyped for common SNPs in *SLCO1B1*. Changes in lipid parameters were compared among genotype groups.**Results:** 139 patients completed treatment with good compliance. Eight SNPs were analyzed at *SLCO1B1* that could influence its activity. Mean total cholesterol (TC) reduction was greater in those having at least one mutant allele at 597C>T (CC:CT/TT, 18:120; -33.1%:-37.6%; $p < 0.05$). Similarly, lipid responses were generally better for those with mutant alleles at SNP 42279T>G, (TT:TG/GG, 35:103; TC: -33.5%:-38.2%; LDL-C: -45.2%:-49.6%; TG: -10.8%:-23.2%; $p < 0.05$). There were no significant findings with other SNPs or among haplotypes *1a, *1b and *15.**Discussion:** SNPs in *SLCO1B1*, which may influence the pharmacokinetics of simvastatin acid, appear to modulate the lipid lowering responses to simvastatin but this needs further replication.

13.

Cholesterol lowering in Patients who Have PCI Performed – safety and efficacy of the generic statins?

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Background: Cholesterol lowering treatment with HMGCoA Reductase Inhibitors (statins) is essential in most of the cardiovascular disease patients. The utilization of generic drugs is being casted doubt by the general public. On the other hand, the saving associated with effective and safe generic drug really help to cut down the drug budget and allow the use of newly potent and brand name drugs for some special patients.**Methods:** To evaluate the safety and efficacy of the generic statins widely used in our hospital since 2007, we studied 143 YCH patients undergoing 173 PCI procedures at PMH in the year 2005. 8 patients died and 5 patients defaulted/referred to other hospitals in year 2005-2006. The remaining 130 patients were followed up and analysed in year 2007-2008.**Results:** All except 8 patients (one fibrin and 7 non-pharmacological treatment) receive statins. No patient suffered from myositis nor hepatitis. 2 patients in Z40 required dose reduction for elevated CPK.

Statins dose (simvastatin equi. Z mg/day)(n)	Generic Z20(29)	Generic Z40(51)	Brand Z71(20)
Sex (male)	21(72.4%)	32(62.7%)*	11(55.0%)*
Age (years)	61.4 \pm 11.4	65.2 \pm 9.0*	62.5 \pm 8.3
Body Weight(kg)	65.4 \pm 10.3	65.1 \pm 11.4	65.9 \pm 14.6
DM (%)	14(48.3)	22(44)	8(40)
A1C(%)	7.0 \pm 1.2	7.8 \pm 1.5*	7.2 \pm 0.9
Systolic Blood Pressure(mmHg)	145.3 \pm 17.7	142.6 \pm 20.9	145.3 \pm 22.2
Diastolic Blood Pressure(mmHg)	75.5 \pm 8.7	75.4 \pm 9.5*	79.5 \pm 10.3
Baseline CrCl(ml/min/1.73m ²)	88.7 \pm 18.9*	72.6 \pm 21.0	76.5 \pm 23.6
TC (mmol/l) at time of PCI	5.0 \pm 0.7	5.0 \pm 1.2	5.4 \pm 1.1**
TG (mmol/l)	1.8 \pm 0.8	1.9 \pm 1.0	2.1 \pm 0.8*
LDL-C (mmol/l)	3.13 \pm 0.58	3.45 \pm 0.86	3.76 \pm 0.88*
HDL-C (mmol/l)	1.21 \pm 0.33	1.01 \pm 0.27**	1.14 \pm 0.36
TC (mmol/l) updated	3.9 \pm 0.7	3.9 \pm 0.7	4.1 \pm 0.6
TG (mmol/l)	1.2 \pm 0.6	1.3 \pm 0.6	1.3 \pm 0.6
LDL-C (mmol/l)	2.22 \pm 0.55	2.19 \pm 0.54	2.47 \pm 0.64*
HDL-C (mmol/l)	1.21 \pm 0.34	1.08 \pm 0.27	1.12 \pm 0.25
Withdrawal or dose reduction	0	2(4%)	1(5%)
Creatinine Phosphokinase CPK (U/L)(median)	149 \pm 107(113)	147 \pm 120(114)	117 \pm 57* (102)
Alanine Transferase ALT(U/L)	26 \pm 12	26 \pm 12	23 \pm 8

* $p < 0.02$, ** $p < 0.001$ as compared with the other group(s)**Conclusion:** The clinical efficacy and safety of generic statins is not significantly different from the brand statins. Regularly close monitoring is mandatory for safely using generic drug(s).

ABSTRACTS

Abstracts for Free Paper Session:

14.

A Epidemiology of Metabolic Syndrome in the races Uyghur and Han of Xinjiang
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 Xinjiang, 830054 P. R. China

Objective: To investigate the prevalence of metabolic syndrome(MBS) and its components in Uyghur and Han nationalities (≥ 50 years) of Xinjiang, and select high risk population.

Methods: The participants were 1187 Uyghur (men 521 and women 666) and 1948 Han nationalities (men 879 and women 1069), with the methods of random sample from Xinjiang of China, subjects respectively in Uyghur and Han were planned to attend the waist circumference, hypertension, hyperglycemia, blood-fat abnormality epidemiology in south and north of Xinjiang. Statistical analysis with SPSS software package.

Results: (1) Morbid (waist circumference, male ≥ 90 cm, female ≥ 80 cm): Uyghur and Han's total morbid 32.85% (male 25.14%, female 39.07%, $P < 0.05$), Han 27.7% (male 22.53% female 32.09%, $P < 0.05$). Uyghur 41.03% (male 29.60% female 50.30%, $P < 0.05$). (2) Morbid of obesity (waist circumference, male ≥ 90 cm, female ≥ 80 cm): Uyghur 59.6%, Han 50.6% ($P < 0.05$). Hypertension (SBP ≥ 130 or DBP ≥ 85 mmHg): Uyghur 57.9%, Han 58.6% ($P > 0.05$). Hyperglycemia (FPG ≥ 5.6 mmol/L): Uyghur 37.8%, Han 32.4% ($P < 0.05$). Blood-fat abnormality (TG > 1.7 mmol/L, low of high-density lipoprotein (male < 0.9 female < 1.1 mmol/L)): Uyghur 28.7%, Han 39.3% ($P < 0.05$). (3) Every age's prevalence of MBS, 50-59: Uyghur 33.02%, Han 23.59%. 60-69: Uyghur 36.50%, Han 34.44%. ≥ 70 : Uyghur 27.65%, Han 28.30%.

Conclusion: (1) The prevalence of MBS is high among Uyghur and Han in Xinjiang, especially in Uyghur women. (2) Morbid of obesity: Uyghur $>$ Han, especially in Uyghur women. Hypertension: both nationalities are equal. Hyperglycemia: Uyghur $>$ Han. Blood-fat abnormality: Han $>$ Uyghur. (3) The prevalence of MBS is highest from 60 to 69.

15.

Serum sex hormone levels associated with aging and arterial blood pressure in the Uyghur longevity people in Hetian, Xinjiang Uyghur Autonomous Region

XJ Xu and YP Ma

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Purpose: The rate of essential hypertension increases with aging. There were many studies that have shown the sex hormones may influence the blood pressure in multiple ways. To investigate the sex hormone levels associated with aging and arterial blood pressure in the Uyghur longevity people (age ≥ 90 years old) in Hetian of Xinjiang Uyghur Autonomous Region.

Methods: 223 of Hetian Uyghur old people were elected in this study. 115 people were 90-110 years old and 108 were 65-70 years old. According to the BP values, the subjects were classified as well as essential hypertensives (EH: $n=70$, SBP/DBP $\geq 140/90$ mmHg) and normotensives (NT: $n=153$, SBP/DBP $< 140/90$ mmHg). And according to the age, the subjects were classified as the longevity people group and the old people group. Height, weight and blood pressure were measured in both groups. Estradiol (E_2) and testosterone (T) were measured by radioimmunoassay.

Results: (1) In both ET and NT groups, compared with the old people, T values were lower in the longevity men (T: EH: 8.0 ± 6.9 nmol/l vs. 17.5 ± 6.1 nmol/l, NT: 8.9 ± 7.5 nmol/l vs. 19.7 ± 8.0 nmol/l) ($P < 0.05$) and were higher in the longevity women (T: EH: 4.4 ± 5.8 nmol/l vs. 1.6 ± 0.6 nmol/l, NT: 5.0 ± 6.3 nmol/l vs. 1.4 ± 0.7 nmol/l) ($P < 0.05$). (2) The longevity men in NT group have higher E_2 values than that in EH group (E_2 : NT: 82.0 ± 54.6 pmol/l vs. EH: 66.3 ± 29.7 pmol/l) ($P < 0.05$). (3) Correlation analysis showed a negative correlation between T values and SBP ($r = -0.310$, $P < 0.05$). (4) A positive correlation was showed between T and E_2 values in the longevity group (male: $r = 0.346$, $P < 0.05$; female: $r = 0.338$, $P < 0.05$). (5) The multiple regression analysis showed a significant effect of age and E_2 values on T.

Conclusions: In Hetian of Xinjiang Uyghur Autonomous Region, T values were 2 lower in the longevity men and higher in the longevity women than the elderly groups. T values decreased with SBP increasing. E_2 and age may be the main influential factors on T values. E_2 may be a kind of protection for the blood pressure of the Uyghur longevity men.

ABSTRACTS

Abstracts for Free Paper Session:

16.

The Clinical Analysis of Hypertension with Adrenal Hyperplasia

XJ Xu and JS Zhang

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Purpose: To observe the characters of hypertension with adrenal hyperplasia.**Methods:** 685 hypertensives all took the CT examination in adrenal. Based on the CT result, the patients were divided into hypertension with adrenal hyperplasia (n=114) and without adrenal hyperplasia (n=141).**Results:** (1) There were 114 hypertensives with adrenal hyperplasia in 685 patients including 99 in left adrenal (86.84%), 1 in right adrenal (0.88%) and 14 in both adrenal (12.28%). (2) The observation group compared with the control group: the cortisol level of observer Group at 17:00 higher than controlled group ($P < 0.05$). (3) The observation group compared with the control group: serum potassium level of the observation group was lower than the control group ($P < 0.05$). (4) The correlation analysis in the observation group + control group, serum potassium and blood glucose two hours was a negative correlation, the Pearson correlation was -0.235, and the Spearman correlation was -0.277; Observer Group of blood glucose with no correlation between serum potassium.**Conclusion:** That hypertension with adrenal hyperplasia mostly occurred in left adrenal. The hyperplasia of the adrenal gland secretion may have independent functions, the impact of the regulation of blood pressure and serum potassium level, serum potassium and blood glucose was negatively correlated.

17.

Changes analysis of angiotensin II and aldosterone the Uygur natural longevous from Hetman in Xinjiang

XJ Xu, L Han, SM Mai, XT Dili, XY Zhang, YS Maimaiti and XM Mao

Department of Hypertension, The First Affiliated Hospital of Xinjiang Medical University, Urumqi, China

Purpose: To explore the reason of longevity among Uygur natural longevous people through the analysis of angiotensin II and aldosterone.**Methods:** The longevous people aged ≥ 90 years old ($n = 99$) were verified by systematic investigation and Uygur old people aged 65-70 years old ($n = 106$) were selected with cluster sampling from Hetian, angiotensin II and aldosterone were measured by radioimmunoassay in them.**Results:** the plasma level of AT- II in the natural longevous people were higher than those of the Uygur old people group, but the ALD of the longevous were lower than those of the old people ($P < 0.05$). (2) by the hypertension clinic monitoring, in hypertension patients, the plasma level of AT- II in the natural longevous people were close to those of the Uygur old people group ($p > 0.05$), but the ALD of the longevous were lower than those of the old people ($P < 0.05$); in non-hypertension patients, the plasma level of AT- II in the natural longevous people were higher than those of the Uygur old people group, but the ALD of the longevous were lower than those of the old people ($P < 0.05$). (3) There was a positive correlation between age and AT- II ($r = 0.217$, $P < 0.01$), there was a negative correlation between age and ALD ($r = -0.623$, $P < 0.01$).**Conclusion:** the prevalence rate of hypertension in the natural longevous people were lower than those in the Uygur old people group, they had own features in changes of the 24-hour ABPM, the risk of target organ's damage was lower than Uygur old people, these may be some reason which promoting longevity among Uygur natural longevous people.

18.

Adjunctive Danshen (丹参) and Gegen (葛根) Therapy Improves Atherogenic Process: A Final Report of Double-blind Placebo Control Trial in High Risk Hypertension

TWC Yip¹, P Chook², SK Kwong³, EML Wong³, W Cheng³, JKY Li¹, AWY Yu³, CC Szeto², TYK Chan², KP Fung², PC Leung², KS Woo^{2,3}, ¹Yan Chai Hospital, ²The Chinese University of Hong Kong, ³Alice Ho Miu Ling Nethersole Hospital, Hong Kong**Introduction:** Danshen and Gegen (D&G) are two traditional herbal medicines used for cardiac symptoms in ancient Chinese medicinal literature. Recent studies suggest their therapeutic effects in blood pressure and lipid-lowering, anti-oxidation, microcirculation-promoting, foam cells-modulation and have beneficial effects on atherogenic process in coronary patients.**Methods:** To evaluate the potential of D&G in primary atherosclerosis prevention in high risk hypertension, 90 patients (74.4% male) with high risk hypertension associated with left ventricular hypertrophy (63.3%), diabetes mellitus (62.5%) and renal insufficiency (30%) were randomized to receive D&G herbal capsules (2gm/day), 1gm/day D+G or identical placebo capsules in double-blind and parallel fashion for 12 months, on top of their anti-hypertensive treatments. Flow-mediated dilation (endothelium-dependent dilation, FMD) and nitroglycerin-induced dilation (endothelium-independent dilation, NTG) of brachial artery, and carotid intima-media thickness (surrogate atherosclerosis marker, IMT) were measured by high resolution B-mode ultrasound.**Results:** Their mean age was 55±8 years. After 12 months and compared with baseline, there were no significant changes in blood pressure, heart rate, blood cholesterol (TC), haematological, glucose (HbA1c), and creatinine profiles in both placebo and D&G groups. FMD and IMT but not NTG improved significantly after D&G ($p < 0.001$) and not after placebo treatment. No significant difference in FMD and IMT changes in the 2 D&G groups was seen. The study herbal drugs were well tolerated in both groups, with no significant adverse events reported.

	Placebo (n=29)		D&G (1gm/day) (n=31)		D&G (2gm/day) (n=30)	
	Baseline	12 months	Baseline	12 months	Baseline	12 months
TC (mmol/l)	4.8±0.9	4.7±1.0	5.4±1.1	5.1±1.0	5.2±0.9	5.0±0.9
HbA1c (%)	7.5±2.6	7.5±2.0	6.8±2.0	6.8±0.7	6.4±1.0	6.3±1.0
Creatinine (μmol/l)	110±41	109±50	128±58	130±64	110±49	110±83
FMD (%)	5.5±1.3	6.2±1.1	5.4±1.9	7.0±2.1*	5.2±1.7	6.6±1.9*
NTG (%)	15.2±2.5	15.9±3.1	18.3±3.9	16.7±3.3	15.4±3.3	16.1±3.1
IMT (mm)	8.0±1.8	8.1±1.7	7.9±2.0	7.4±1.6**	8.25±1.8	7.8±1.6**

(compared with baseline: * $p < 0.001$; ** $p < 0.05$)**Conclusion:** Danshen and Gegen adjunctive treatment was well tolerated and significantly improved atherogenic process in high-risk hypertensive patients, with potential in primary prevention of atherosclerosis.

19.

The Effects of Vitamin B12 and C Supplementation on Atherogenic Process Related to Environmental Tobacco Smoke

ML Chiu¹, P Chook¹, XH Feng², TWC Yip¹, ML Evora¹, KV Koon¹, TYK Chan¹, XM Zhang², CL Chu³, HC Leong³, KS Woo⁴, ¹Hospital Central Conde de S. Januario, Macao, ²Kiang Wu Hospital, Macao, ³Macao Heart Foundation, ⁴The Chinese University of Hong Kong**Introduction:** Atherosclerosis is the most important medical problem of modern society. High environmental tobacco smoke in casino is associated with an accelerated atherogenic process. We hypothesize vitamin B12 or C supplementation, with favourable antioxidant and other effects, may be beneficial in vascular protection.**Methods:** 78 passive smoking casino employees (19.2% male, mean age 45.0±8.2 years) were randomized to receive vitamin B12 (500μg daily), vitamin C (200μg daily), vitamin B12+C or double image-matched placebo capsules in double-blind 2 x 2 factorial design fashion for 1 year. Vascular reactivity (brachial FMD) were measured by ultrasound at baseline and 12 months.**Results:** Of the 78 passive smokers, 9% had hypertension, 6.4% had diabetes mellitus and 19.2% hypercholesterolemia. There were no significant changes in their blood pressure, lipid (LDL-C, HDL-C and TG) profiles, glucose, creatinine and body mass index (BMI) during supplementation for 1 year, but a significant increase in blood B12 during vitamin B12 ($p < 0.02$) and vitamin B12+C supplementation ($p < 0.001$). Brachial FMD improved during 3 active treatment periods ($p < 0.0001$), but not during placebo, and was higher during vitamin B12+C combination than either vitamin B12 or C period ($p < 0.04$).

	Placebo (n=21)		Vitamin B12 (n=15)		Vitamin C (n=19)		Vitamin B12+C (n=23)	
	Baseline	12 months	Baseline	12 months	Baseline	12 months	Baseline	12 months
SBP (mmHg)	123±19	120±17	124±15	122±18	117±16	111±10	116±12	108±11
DBP (mmHg)	83±11	79±9	84±12	80±12	78±11	73±10	80±6	72±7
Glucose (mmol/l)	5.1±1.1	5.2±1.0	4.8±0.5	5.1±0.6	4.7±0.8	5.0±0.9	4.9±0.8	4.9±1.0
Creatinine (μmol/l)	71.4±15.6	64.7±19.2	71.5±11.7	72.1±10.4	70.0±15.3	67.0±15.3	67.5±10.8	62.4±10.7
LDL-C (mmol/l)	3.2±0.9	3.0±0.8	2.9±1.4	3.1±1.1	3.3±1.0	3.4±1.1	2.7±0.8	2.9±0.7
HDL-C (mmol/l)	1.8±0.5	1.6±0.4	1.7±0.4	1.6±0.4	1.8±0.4	1.6±0.4	1.8±0.4	1.6±0.3
TG (mmol/l)	1.5±1.1	1.9±1.8	1.2±0.7	1.6±1.6	1.2±0.6	1.2±0.6	1.0±0.6	1.2±0.6
BMI (kg/m ²)	23.4±4.2	23.7±3.6	23.4±3.5	23.4±4.2	22.0±2.8	22.3±3.1	22.5±2.9	23.0±2.7
B12 (pg/l)	464±159	510±198	439±148	695±251*	491±161	486±186	504±215	767±345**
FMD (%)	7.6±1.1	7.6±1.0	7.8±1.7	8.5±1.4***	7.6±1.3	8.2±1.3***	7.8±1.3	9.0±1.2***
GTN (%)	19.4±2.5	19.0±3.0	18.9±2.9	19.2±2.5	17.7±2.5	19.9±5.1	18.9±2.8	17.3±2.4

Compared with baseline: * $p < 0.02$; ** $p < 0.001$; *** $p < 0.0001$ **Conclusion:** Vitamin B12 or C supplementation used alone or in combination improves vascular reactivity and may contribute to atherosclerosis prevention in high environmental tobacco smoke.

ABSTRACTS

Abstracts for Free Paper Session:

PERCUTANEOUS CORONARY INTERVENTION II

20.

Diabetes Mellitus and Atherosclerotic Plaque Compositions: Insights from Virtual Histology.

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Purpose: Patients with diabetes mellitus (DM) have worse clinical outcomes regardless of revascularization strategies. This implies that the coronary plaque morphology may differ in diabetic patients compared to non-diabetics. The objective of this study was to evaluate tissue composition of coronary plaques in patients with DM and non-DM by using Virtual Histology (VH-IVUS).

Methods: Thirty-two Patients who had angiographically visible lesions were selected for assessment with a commercially available VH-IVUS console (Volcano Corp.). Patients were divided into two groups: a DM group (10/16 men, 38 lesions) and a non-DM group (8/16 men, 34 lesions). VH-IVUS allows reliable characterization of atherosclerotic plaques into four different types: fibrous, fibrofatty, dense calcium and necrotic core. All VH-IVUS studies were performed using a 20MHz solid-state catheter (EagleEye, Volcano Corp.) with an automated pullback speed of 1.0mm/s. IVUS 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 \pm SD, and p values \leq 0.05 were considered significant.

Results: Overall relative findings and plaque composition are presented below:

	DM	Non - DM	p value
Age	63.79 \pm 10.97	68.18 \pm 8.94	0.12
Lumen Diameter (mm)	2.45 \pm 0.50	2.35 \pm 0.48	0.22
Lumen Area (mm ²)	4.93 \pm 2.40	4.55 \pm 2.19	0.25
Vessel Diameter (mm)	4.26 \pm 0.71	4.09 \pm 0.77	0.17
Vessel Area (mm ²)	14.99 \pm 4.87	14.12 \pm 5.10	0.24
% Plaque Burden	66.09 \pm 10.39	65.6 \pm 12.42	0.43
% Fibrous	44.87 \pm 15.24	52.88 \pm 17.19	0.05
% Fibrofatty	3.06 \pm 3.16	5.71 \pm 6.07	0.016
% Calcium	16.09 \pm 11.17	14.03 \pm 12.80	0.24
% Necrotic Core	33.65 \pm 12.63	27.09 \pm 13.92	0.025

Conclusions: When compared to non-DM patients, DM patients had more necrotic core, lesser fibrous and fibrofatty tissues in their plaque content, suggesting DM patients to have a substantially higher risk of clinical events than non-DMs.

21.

Outcome of patients with potential bleeding tendency receiving Genous Bioengineered R-stent

Ling-ling Cheung, Chi-Kin Chan, Chiu-sun Yue, Division of Cardiology, Department of Medicine and Geriatrics, United Christian Hospital, Kowloon, Hong Kong.

Introduction: Drug eluting stents are proved effective in reducing restenosis and yet, the associated delay endothelialization poses concern with stent thrombosis. Prolonged dual antiplatelet therapy (DAPT) is often required. In contrast, the Genous stent is coated with antibodies which attract circulating endothelial progenitor cells, thus accelerating endothelialization at the site of vascular injury. This pro-healing effect may reduce duration of DAPT and therefore be useful in patients who cannot tolerate standard duration of DAPT due to various reasons.

Objective: We report on our initial clinical experience with Genous stent in patients with potential bleeding tendency which may limit the duration of use of DAPT.

Method: Indication of PCI, patient demographics, procedure details, concomitant use of DAPT, major adverse cardiovascular events (death, cardiac death, MI, CABG, clinically driven TLR/ TVR, stent thrombosis, bleeding events) were retrieved from our PCI registry and analysed.

Results: A total of seven subjects were recruited since August, 2007, among which four were male patients. Their mean age was 72.6 \pm 5.3 years (range 67-81). Five out of seven had at least 2 risk factors, namely hypertension, diabetes mellitus, hyperlipidemia and cigarette smoking. Five patients presented with NSTEMI and 2 patients had unstable angina. All of them were either having concomitant bleeding tendency or awaiting major operation (table). On average, two lesions were tackled in each case with lesion types mostly B to C (AHA/ACC coronary lesion classification).

The procedural success, defined as angiographic success and absence of MACE at discharge, was 100%. The total MACE at 30 days was 0%. There was no bleeding event leading to premature termination of DAT. Over a mean follow up of 168 days, there was no additional MACE. All patients reported an improvement in angina class. However, one patient died in surgical ward on day 73 post PCI due to sepsis.

Conclusion: On its merit of pro-healing effect, Genous stent can be considered as an alternative in patients who require PCI but also having bleeding tendency or awaiting major surgery. However, long term data and large scale population study may be needed to prove its long term efficacy and safety against other stent types.

22.

Clinical and Biochemical Outcome of PCI Patients with moderate to severe renal impairment

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Background: Atherosclerotic disease is prevalent among subjects with many common risk factors which can also affect the renal function. Thus the decision for patients with renal impairment to go for revascularization therapy is challenging.

Methods: To evaluate the clinical and biochemical outcome of patients after percutaneous coronary intervention (PCI), 143 YCH patients undergoing 173 PCI procedures at PMH in the year 2005 were studied and followed up over 3 years. Their Major Adverse Cardiovascular Events(MACE)(death, myocardial infarction, repeat PCI or CABG) were analysed. 3 categories of renal function were grouped for comparison - <50, 50-75, >75 ml/min/1.73m².

Results: There was significant difference in the patient outcome, with higher MACE for the poorest renal function group, but renal function is relatively preserved in this group of patients.

Baseline renal impairment	Moderate to Severe (n=22)	Mild to Moderate (n=56)	Mild to Normal (n=65)
CrCl(ml/min/1.73m ²)	39.7 \pm 10.2	64.1 \pm 6.5	89.6 \pm 13.5
Baseline CrCl	69.4 \pm 7.6	68.1 \pm 8.1	60.3 \pm 9.7**
Baseline Age (years)	11(50%)*	37(66.1%)	48(73.9%)
Sex (male)	8(36.4)	18(32.1)	18(27.7)
DM (%)	7.0 \pm 1.2	7.5 \pm 1.5	7.4 \pm 1.3
A1C (%) (updated)	14(63.6)*	30(53.6)	30(46.2)
HT (%)	147.2 \pm 24.6	145.1 \pm 20	141.1 \pm 18
Systolic BP(mmHg)(updated)	74.4 \pm 6.8	73.8 \pm 9.7	77.6 \pm 9.2
Diastolic BP(mmHg)	61.5 \pm 11.4	64.8 \pm 11.3	66.9 \pm 11.8**
Body weight(kg) (updated)	36.9 \pm 3.9**	39.9 \pm 2.3	39.9 \pm 2.7
Serum Albumin (g/L) (updated)	10(45.5)	27(48.2)	26(40.0)
Ex-/Smoker(%)	4.76 \pm 1.0	4.83 \pm 0.96	5.21 \pm 1.0*
TC (mmol/l)(Baseline)	1.63 \pm 0.72	1.95 \pm 1.04	1.86 \pm 1.0
TG (mmol/l)	3.53 \pm 0.64	3.11 \pm 0.77**	3.64 \pm 0.69
LDL-C (mmol/l)	1.04 \pm 0.16**	1.15 \pm 0.35	1.12 \pm 0.29
HDL-C (mmol/l)	188 \pm 88*	152 \pm 62	161 \pm 92
Contrast dose(ml)	34.4 \pm 13.4	60.6 \pm 10.7	79.9 \pm 14.1
After procedure CrCl	41.1 \pm 14.2	60.5 \pm 13.5	82.2 \pm 13.5
After 3 years CrCl	6(27.3%)*	8(14.3%)	9(13.8%)
MACE(1 year)	9 (40.9%)*	17 (30.4%)	18 (27.7%)
MACE(up to 3 years)			

*p<0.02, **p<0.001 as compared with the other group(s)

Conclusion: Though patients with moderate to severe renal impairment had poorer outcome in general, clinical and biochemical parameters suggest that they still benefit from PCI procedures.

23.

Outcomes in Elderly Patients Undergoing Percutaneous Coronary Intervention in a Regional Hospital

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

Purpose: Prior studies of percutaneous coronary intervention (PCI) in elderly patients demonstrate increased in-hospital and one-year mortality. We sought to evaluate the result of PCI in octogenarians (patients aged 80-89 years) 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 March 2006 and March 2008 in our hospital. All patients discharged were followed up for at least 1 year (mean follow-up period of 609 Days, 279 Days). Their clinical characteristics, procedural data, cumulative one-month and medium-term clinical outcomes (MACCE, major adverse cardiac and cerebrovascular events, consisting of death, myocardial infarction (MI), target vessel revascularization and stroke) were obtained and analyzed.

Results: Fifty four patients were identified with a mean age of 82.2 \pm 2 years, with male predominance (63%). It contributed to 4.8% of the PCI we performed in that period. The indications of PCI were stable angina in 61% of patients and acute coronary syndrome in the remaining 39%. Coronary angiography documented multi-vessel disease in 51.9% of patients with relatively complex lesions (type B or C) in 93% of treated patients. Acute procedure success rate was 94% and stents were used in 94% of cases. Cumulative mortality at hospital discharge and by 30-days was 0% and increased to 5.6% (3 patients) at six-month and 9.3% (5 patients) during the whole follow-up period. At least 80% of mortality was related to cardiovascular events. The causes of death included myocardial infarction (MI) (3 cases), stroke (1 case) and unknown (1 case). The cumulative rate of recurrent myocardial infarction and stroke was 11.1% and 3.7% respectively at long-term. No repeated revascularization was performed within the follow-up period. The remaining patients reported improvement in anginal symptoms. 7.4% of patients remained symptomatic in terms of angina (CCS class III) after PCI, and only partial revascularization was achieved in this group of patients.

Conclusion: PCI can be performed safely in well selected elderly patients, with good procedural success rate and acceptable short-term mortality. Moreover, most patients referred improvement in angina status after PCI.

ABSTRACTS

Abstracts for Free Paper Session:

24.

Long Term Clinical Outcomes after Deployment of Femoral Vascular Closure Devices in Coronary Angiography and Percutaneous Coronary Intervention

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Background We evaluated the long term clinical outcomes of femoral vascular closure devices following its deployment in coronary angiography and percutaneous coronary intervention procedures.

Methods From June 2000 to September 2004, 265 patients who received femoral vascular closure devices after coronary angiography and percutaneous coronary interventions were enrolled into the study. Patients' medical records were reviewed and vascular complications within one year of follow-up period were recorded. Rutherford's categories of claudication were used to quantify different degrees of claudication and leg ischaemia. Duplex ultrasonography of both femoral arteries (using the non-accessed site as control) was performed at one year after deployment of vascular closure devices. Vessel diameter and flow velocities for both common femoral arteries were obtained.

Results There was no occurrence of late vascular complications like arteriovenous fistula, pseudoaneurysm, surgical repair of access site complications, late groin bleeding and infection. By Rutherford categories of claudication, 99.2% of patients had Grade 0 claudication while the remaining 0.8% was in Grade 1.

By arterial Duplex ultrasonography, the peak systolic velocity of the accessed femoral artery (predominantly right side) was nonsignificantly higher, 94.9 ± 26.0 cm/s when compared to 91.5 ± 24.8 cm/s in the control site ($p=0.12$). As for vessel diameter, no significant difference was found in the mean end-diastolic vessel diameter 8.8 ± 1.3 mm (puncture site) versus 8.7 ± 4.4 mm (control site) ($p=0.72$).

Conclusion We found that the use of femoral closure devices was safe and it was not associated with any adverse long term vascular complications.

25.

The characteristics and outcome of patients taking dual anti-platelet therapy who subsequently required oesophagoduodenoscopy after percutaneous coronary intervention

Dr John T Wong, Dr CS Yue, Division of Cardiology, United Christian Hospital, Kwun Tong, HKSAR

Introduction: Although the usage of dual anti-platelet therapy (DAT) is mandatory in patients who had coronary stents implantation for the prevention of stent thrombosis – a potentially fatal complication of percutaneous coronary intervention (PCI); such combination is also known to increase gastrointestinal (GI) bleeding events. This study was to attain relevant data regarding the characteristics and outcome of patients taking DAT who required oesophagoduodenoscopy (OGD) after PCI.

Method: All patients who had undergone PCI with coronary stenting in United Christian Hospital (UCH) during Jan - Dec 2008 and subsequently required OGD for various reasons were included for analysis.

Results: Twelve patients were included during the above period and their mean follow-up time was 209.6 ± 103.4 days. Their mean age was 70.8 years and most of them were males (92% - 11 patients). Four patients were deemed high risk for GI events before they were put on DAT, namely history of peptic ulcer disease; and only one of them was on PPI for GI protection. The various indications for performing OGDs were as follows: anaemia (7 patients), epigastric pain (2 patients), melena (1 patient), heartburn (1 patient) and rescope for previous abnormal findings (1 patient). Only half of those patients had GI symptoms. All but one patient had indications for OGD while on DAT, and the mean time from their index PCI to their index OGDs was 32.8 ± 46.6 days. Only one third of those patients (4 patients) were found in their index OGDs to have hard GI events (defined as gastric or duodenal ulcer or any other findings with signs of recent significant bleeding), the rest had either mild GI events including gastritis (3 patients), gastric erosion (1 patient), duodenitis (1 patient) and both gastritis and duodenitis (1 patient); or normal findings (2 patients). Only 2 patients had either one or both of their DAT stopped for certain period of time and all except one patient were subsequently treated by PPI. None of these patients had developed adverse cardiovascular (CV) events while withholding DAT during their GI events.

Conclusion: In this retrospective study, very few patients (~3%) taking DAT after PCI would require OGD. Only 4 patients were found to have hard GI events which can be easily treated by addition of PPI. Fortunately, none of these patients developed adverse CV events as a consequence. It is interesting to know that whether the need of OGDs and the incidence of GI complications will be substantially reduced after the implementation of consensus recommendation of PPI prophylaxis for all patients on DAT after PCI in future.

26.

Feasibility and Safety of Day-case Coronary Angiogram Using the Transradial Approach

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Introduction: Coronary angiogram (CA) was traditionally performed via the transfemoral route and usually required admission for 2 to 3 days. In recent years, day-case based CA is increasingly performed and transradial approach is getting more popular. We sought to review the feasibility and safety of transradial CA as a day-procedure in our ambulatory day care centre.

Method: We retrospectively included all consecutive patients undergoing elective CA in our day care centre from Jan to Dec 2008. Patients who are eligible for day case procedures should meet our standard pre-defined selection criteria. Major exclusion criteria include patients with age greater than 80, chronic renal impairment, poorly controlled heart failure or arrhythmias cognitive impairment. All patients need to attend a pre-procedure education lecture arranged on a separate day when their essential blood tests, ECG or CXR will be screened for their readiness and suitability. All day case CA will be scheduled as the first morning cases. If feasible, transradial approach is the preferred route. Patients will be discharged around 6 hours after their procedures.

Results: 122 patients underwent CA during the study period. 85% was successfully performed via the transradial route and 15% via the femoral route. Overall, 96% of the patients (117/122) could be discharged on the same afternoon after the procedure. 5 patients (4%) were found to have significant coronary artery disease and therefore required admission for further management. At 30 day follow up either in the clinic or by phone follow up, there was no major adverse effects in terms of death, myocardial infarction, stroke or major wound complications. Comparing the transradial with transfemoral patient groups, the radial group reported better post procedure comfort and earlier mobilization. Patients could be discharged around 6 hours as an average after the procedure. A projected 234 hospital days had been saved with this strategy given that 117 patients were successfully discharge on the same day.

Conclusion: Day-case CA using the transradial approach is safe, practicable and cost effective in carefully selected patients.

27.

Quality of Life after Percutaneous Coronary Intervention in Acute Coronary Syndrome Patients

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Purpose: Percutaneous coronary intervention (PCI) is associated with reduction in adverse events in Acute Coronary Syndrome (ACS) patients. However, there is limited data on health related quality of life (HRQoL) in ACS patients after PCI.

Methods: We prospectively enrolled 526 patients admitted to our institution with ACS from Feb '08 to May '08. Short Form (SF)-36 health survey was used to assess physical and mental health status at baseline & 6 months. Baseline characteristics and HRQoL (physical- (PCS) and mental- (MCS) component scores), were compared between patients who underwent PCI with patients treated conservatively. Uni- and multivariable analysis was performed to independent predictors of improvement in HRQoL at 6 months. Propensity score of probability in undergoing PCI was used to adjust for potential bias in treatment selection.

Results: PCI was performed in 279 (53%) and 247 (47%) were treated conservatively. Of these patients, 31 (1 in PCI vs. 30 in non-PCI, $p<0.001$) died before interview on 6 month. Patients undergoing PCI were younger (64.1 ± 11.4 vs. 73.2 ± 11.8 , $p<0.001$), less likely to be female (36.4% vs. 63.6%, $p<0.001$) and more likely to present with STEMI (41% vs. 22%, $p<0.001$). The group who underwent PCI also had higher PCS at baseline and experienced more improvements in physical health status compared with patients treated conservatively (Table). There were no significant differences in mental health status at baseline or follow-up between treatment groups. These findings were maintained in multivariable models correcting for propensity score of undergoing PCI.

Table Physical and Mental Component Scale			
HRQoL*	PCI	Non-PCI	p Value
PCS	Baseline	31.3±15.7	27.9±15.7
	6 Month	41.8±12.9†	35.1±17.8*
MCS	Baseline	51±12.1	52.3±13.1
	6 Month	53±10.3	54.4±11.7*

† $p<0.001$, paired t-test.

ABSTRACTS

Abstracts for Free Paper Session:

CORONARY ARTERY DISEASE AND HEART FAILURE

28.

The Predictive Effects of Serum Very-Low-Density Lipoprotein Cholesterol on Coronary Heart Disease: The Results of China Multi- Provincial Cohort Study in 12 Years

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Objective: To evaluate the predictive effects of serum Very-Low-Density Lipoprotein (VLDL) cholesterol on risk of CHD in Chinese population aged 35-64 years.

Methods: This prospective study was performed from 1992 to 2004 in 11 provinces of China and the association between baseline VLDL cholesterol level and the risk of CHD events (Including acute myocardial infarction, sudden death, and other coronary death) was analyzed in 29 937 subjects aged 35-64 years and free of cardiovascular diseases in baseline using Cox multivariate proportional hazards regression.

Results: A total of 29 937 subjects (15945 men, 13992 women) were analyzed and the average age was 46.9 years. During the average 12 years of follow-up, 241 CHD events occurred in these participants. Multivariate analysis showed that the relative risk of CHD events in groups of VLDL cholesterol 20~29 and ≥ 30 mg/dl were 1.68 (95% CI 1.23~2.30) and 1.65 (95% CI 1.17~2.31), respectively, comparing with reference group (< 20 mg/dl), after adjusted for age, gender, current smoking status, diabetes status, HDL cholesterol, body mass index, blood pressure and LDL cholesterol. Joint analysis to combined groups of VLDL cholesterol and LDL cholesterol indicated that within each group of VLDL cholesterol, the risk of CHD increased with increasing groups of LDL cholesterol, similarly, compared with the group VLDL cholesterol < 20 mg/dl, within each group of LDL cholesterol, the risk of CHD is increased, especially in group VLDL cholesterol 20~29 mg/dl. There were 24.2% CHD events attributable to the increasing of VLDL cholesterol levels in population with LDL cholesterol < 130 mg/dl, obviously higher than other risk factors.

Conclusion: VLDL cholesterol was strongly associated with incidence of CHD events and it is an independent predictive factor to CHD. The relative risk of CHD events began increasing from VLDL cholesterol 20mg/dl in Chinese people. Elevated VLDL cholesterol levels plays more important role to CHD events in population with LDL cholesterol < 130 mg/dl than other risk factors.

29.

Oral Glucose Tolerance Test Screening for Acute Coronary Syndrome Patients Without History of Diabetes Mellitus

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Purpose: Impaired glucose tolerance (IGT), like diabetes mellitus (DM), is a known risk factor of cardiovascular disease (CVD) and is associated with increased all-cause and cardiovascular mortality as demonstrated in several large-scale studies. Early detection and management of IGT in CVD patients not only can lower their cardiovascular risk, but also retards the progression to frank DM and development of other diabetic complications. ESC 2007 Guidelines on diabetes, pre-diabetes and cardiovascular disease recommend screening patients with established CVD but without known DM by using Oral Glucose Tolerance Test (OGTT). However, it is not uncommon for physicians to just rely on screening fasting blood glucose results and ignore further screening for IGT or DM in high cardiovascular risk patients. We aim to investigate the prevalence of undiagnosed DM or IGT in CVD patients by performing OGTT screening in patients presented with acute coronary syndrome (ACS).

Method: Patients admitted for ACS from April to December 2008 were studied. Previous DM or pre-DM status, in-patient fasting blood glucose (FBG) and HbA1c were checked at baseline. For patients without known history of DM and having FBG ranged between 5.1 and 6.9 mmol/L, we would perform OGTT with 75 gram glucose in out-patient setting after discharge. Patients without history of DM and having FBG equal or more than 7.0 mmol/L, FBG would be repeated after discharge and OGTT would be performed subsequently if second FBG ranged from 5.1 to 6.9 mmol/L for confirmation. Patients with newly diagnosed DM, IGT or impaired fasting glucose (IFG) and those without DM were then identified according to 2003 revised ADA criteria.

Result: A total of 191 patients admitted for ACS were studied, among which 61% were male. OGTT was performed on average at Day 29 after admission. 92 (48%) patients had previous history of DM. 14 patients (7%), 21 patients (11%), 3 patients (2%), 3 patients (2%) and 58 patients (30%) were newly identified to have DM, IGT, IFG, IFG together with IGT and without DM respectively. Among 57 patients without history of DM and having FBG < 5.6 mmol/L, 3 (5%) had newly diagnosed DM, 9 (16%) had IGT or IFG and 45 of them (79%) had normal glucose tolerance according to subsequent OGTT result. By using FBG < 5.6 mmol/L to rule out DM or pre-DM (IGT, IFG or both), the sensitivity was 78% (45/58) and specificity was 71% (29/41). In newly diagnosed DM group, 13 out of 14 patients had their FBG < 7.0 mmol/L on admission. Sensitivity of using FBG ≥ 7.0 mmol/L as screening for DM was 7% (1/14) and the specificity was 99% (83/85).

Conclusion: Diabetes mellitus and impaired glucose tolerance are well known risk factors of CVD. In our study, 14% (14/99) patients are undiagnosed diabetic and 27% (27/99) patients have undiagnosed pre-diabetes after OGTT. Fasting blood glucose test alone is not sensitive enough to detect DM (sensitivity 7% by FBG ≥ 7.0 mmol/L) or to rule out DM and pre-diabetes (sensitivity 78% by using FBS < 5.6 mmol/L). We recommend following ESC guideline on diabetes and pre-diabetes screening and to perform OGTT in ACS patients without known history of DM.

30.

Do differences exist in the risk factors, complications and initial treatment modality between Chinese men and women present with ST elevation myocardial infarction in Hong Kong?

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Purpose: Gender-specific issues in ischemic heart disease are vastly investigated in many large scale international research studies. However, recent similar studies in Chinese population are scarce. This study is to analyze whether difference in risk factors, complications and initial treatment modality exist between Chinese men and women in STEMI. Reasons of discrepancy in initial treatment modality are also reviewed. **Methods:** A retrospective study to compare the risk factors, complications, initial treatment modality of Chinese men and women presented with STEMI admitted to Queen Elizabeth Hospital between January 2007 to December 2008. The records of 136 men and 54 women presented to the hospital were successfully retrieved, reviewed and were statistically compared.

Risk factors	Male (n=136)	Female (n=54)	p
Age	62.25 +/- 13.48	74.11 +/- 9.86	NS
PVD	2 (1.47%)	1 (1.85%)	NS
CVA	14 (10.29%)	7 (10.96%)	NS
DM	35 (25.74%)	25 (46.3%)	P=0.005
HT	47 (34.56%)	34 (62.96%)	P=0.0003
Smoking	82 (60.29%)	4 (7.43%)	P<0.0001
hyperlipidemia	53 (38.97%)	15 (27.78%)	NS
Prior PCI	13 (9.59%)	5 (9.26%)	NS
Complications	Men (n=136)	Women (n=54)	P
Shock	24 (17.65%)	15 (27.78%)	NS
Acute pulmonary edema	8 (5.88%)	11 (20.37%)	p=0.003
Arrhythmia	17 (12.5%)	11 (20.37%)	NS
Mechanical complications	1 (0.74%)	3 (5.56%)	NS
Initial Treatment	Men (n=136)	Women (n=54)	P
Thrombolysis or primary PCI	128 (94.12%)	46 (81.48%)	P=0.007
Delay presentation (> 12 hrs) or unknown onset	2 (1.47%)	5 (9.26%)	P=0.02
Contraindication to thrombolysis or Primary PCI	6 (4.41%)	2 (3.7%)	NS

Conclusion: In patients with STEMI, there were more women with DM and hypertension, whereas more men were smoker. Among all the complications, women were more likely to suffer from APO in STEMI. Significantly fewer women were not given either thrombolytic therapy or primary PCI as initial treatment due to delay presentation or unknown onset. Patient education and public awareness especially to our female population is needed for early recognition of symptoms, so that they can receive prompt treatment.

31.

The Improvement of Managing Chest Pain Patients with the Implementation of Chest Pain Observation Unit (CPOU) in A&E

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Purpose: To assess the effectiveness of CPOU in A&E in managing chest pain patients.

Methods: A prospective descriptive study was conducted from 22 May 2006 to 4 December 2008.

A&E patients with possible ischaemic heart disease (IHD) or low risk acute coronary syndrome (ACS) that might require admission into medical wards were recruited into the CPOU programme.

Those with high risk ACS or having alternative causes of chest pain were excluded. The patients were managed according to the CPOU protocol. They had 3 electrocardiographs (ECGs) at 1, 2, 4 hours, and two blood tests for Troponin I (on admission and 6-8 hours later). For the discharged cases, they were followed up in the A&E outpatient clinic after fast-track treadmill investigations. The end-points for improvement were the reduction of admission, and mortality and myocardial infarct within one month for the discharged cases. The data were collected from AEIS and ePR system, and then analysed by using SPSS version 12.0.

Results: Data were analysed for the 101 patients recruited. The male to female ratio was 70: 31 (69.3% Vs 30.7%). The age ranged from 29 to 81, with a mean 57.0 years old. 95(94.1%) of CPOU patients were discharged home, and 6(5.9%) were admitted into hospital. Among the 95 patients who were discharged home after CPOU programme, none had myocardial infarct or death within one month of discharge, and 3 of them re-attended A&E for chest pain within 30 days.

Conclusion: The CPOU in A&E is effective to reduce 94% hospital admission of those patients presented to A&E with possible IHD or low risk ACS. There was no mortality or myocardial infarct for those patients discharged from CPOU.

ABSTRACTS

Abstracts for Free Paper Session:

32.

Diagnostic Value of N-Terminal Pro-B-Type Natriuretic Peptide in Chinese Patients with Stable Coronary Artery Disease

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Objective N-terminal pro-B-type natriuretic peptide (NT-proBNP), synthesized in response to ventricular wall stress, cardiac ischaemia and atherosclerotic burdens, has been well recognized for its clinical utility in diagnosis and prognosis of heart failure. In addition, evidences are emerging with regard to its value in patients with coronary artery disease. This study was designed to evaluate the value of NT-proBNP in stable Chinese patients with symptoms suggestive of coronary artery disease. The aim was to determine whether NT-proBNP correlated with angiographically proven disease. The diagnostic performance of NT-proBNP in predicting significant disease, in comparison to another cardiac biomarker high-sensitivity C-reactive protein (hsCRP), was also assessed.

Method 174 Chinese patients referred for coronary angiogram between 1st July, 2008 to 30th September, 2008 were enrolled. Blood sample was taken for NT-proBNP assay before angiogram. Demographic and clinical characteristics of patients, pre-operative non-invasive investigations and angiographic results were recorded and analyzed.

Results The median NT-proBNP level were 74.55 pg/ml, 118.85 pg/ml, 249.45 pg/ml and 165.45 pg/ml in patients with no or minor, 1-vessel, 2-vessel, and 3-vessel or left main disease respectively ($p = 0.015$). Patients in the highest NT-proBNP quartile had more severe disease, with 53.5% having multivessel disease, compared with 16.9% in the lowest quartile ($p = 0.026$). NT-proBNP was an independent predictor of significant coronary artery disease with odds ratio 2.73 (95% C.I. = 1.43 – 5.21, $p = 0.002$) after adjustment for confounders. Using NT-proBNP alone for prediction of significant coronary artery disease produced an area under receiver operating characteristic curve of 0.628 (95% C.I. = 0.541 – 0.715, $p = 0.004$). In a subset of patients referred for coronary angiogram based on positive treadmill exercise stress test, addition of NT-proBNP assessment improved the diagnostic accuracy from 46.8% to 66.1% ($p = 0.01$). hsCRP did not show correlation with angiographic severity, and has no value in predicting significant coronary artery disease.

Conclusion NT-proBNP correlated with angiographic findings in stable patients. Addition of this biomarker to positive treadmill exercise stress test may improve the diagnostic accuracy. Although NT-proBNP was shown to be an independent predictor, the power of this biomarker in discriminating stable patients with significant coronary artery disease is fair only. Using NT-proBNP as a single, non-invasive test in decision making could not be recommended.

33.

Pre-mature (<=45 years old) acute myocardial infarctions: clinical profiles and angiographic features

Name of corresponding authors: Dr. LK Chan, Dr. CS Chiang, Dr. KC Ho, Dr. KT Chan, Dr. KY Lee, Dr. CW Chan, Dr. CL Fu, Dr. HS Ma, Dr. CY Wong, Dr. KC Chan, Dr. M Cheng, Dr. SF Chui, Dr. Iris Kwan Address: Division of Cardiology, Department of Medicine, Queen Elizabeth Hospital, Hong Kong SAR

Purpose: Heart attack is the second killer in Hong Kong. A total of 4421 patients were died of acute myocardial infarction (AMI) in 2007, in which 63 of them were <= 45 years old. There was little literature study on these pre-mature AMI patients in our locality.

Aim: to evaluate the clinical profiles and angiographic results of the patients with pre-mature AMI.

Methods: Retrospective case-control study. All the patients who were <=45 years old on admission and who were diagnosed to have AMI as principal diagnosis between 01/01/2005 and 31/12/2008 in Queen Elizabeth Hospital were identified via the electronic registry system(CDARS). Definition of AMI was based on ACC/AHA/ESC joint definition. Corresponding controls (patients older than 45 years old) were retrieved as well. Medical notes and cines of all the patients were reviewed. Chi-square test, t-test and logistic regression model using Stata 9.0 (statistical software) was performed to analyze the data.

Results: A total of 108 patients were diagnosed to have AMI as principal diagnosis in the registry from 2005 to 2008 with age <=45 years old. 12 (11%) were female and 96 (89%) were male. The youngest one was 23 and the eldest one was 45 with the mean age of 40. Corresponding 108 controls were retrieved with 44 (41%) were female and 64 (59%) were male. Age of controls ranged from 47 to 99 with the mean age of 73. There was significant difference between cases and control with respect to age ($p<0.001$) and gender ($p<0.001$). The commonest presentation was chest pain in both groups (94% in cases and 56% in controls), more patients with acute pulmonary edema in controls (10% vs 2% in cases) and similar incidence of VF (~3-4 % in both groups). The most prevalent risk factors in cases were hyperlipidemia (total chol>5.2 or LDL>2.6mmol/L) (66%), active smoker (58%), DM (FG>=7.0mmol/L) (28%). The other risk factors such as HT (26%), history of IHD (7%), family history of IHD (7%), drug abuse (4%), thrombocytosis (1%), history of stroke (2%) and renal impairment (4%). In opposite, the most common risk factors in controls were hyperlipidemia (60%), hypertension (58%) and DM (53%). Comparing cases and controls, there was no significant difference in the risk factor of hyperlipidemia ($p: 0.398$). However, significant difference was found in the risk factors of hypertension, DM, smoking, personal and family history of IHD. 96% of the cases had at least one risk factor, 35% had 2 and 22% had 3 risk factors comparing 94% of controls had at least 1 risk factor, 23% had 2 and 29% had 3 risk factors ($p<0.044$). Interestingly, only one female case was active smoker. More patients presented with ST elevation AMI in cases (69%) vs 33% in controls ($p<0.001$). 88 cases (81%) underwent coronary angiogram with most of them 40% presented with single vessel disease (lesion >=60% stenosis) vs 45 controls (42%) underwent angiogram with most of them 40% presented with triple vessel disease ($p: 0.021$). After adjusting for all the variables, the most significant risk factor between cases and controls was smoking ($p: 0.028$ with OR: 6.29). The most significant association with ST elevation AMI were history of IHD ($p: 0.003$, OR: 3.77) and age ($p: 0.004$, OR: 1.06).

Conclusion: Clinical profiles and angiographic features were different between pre-mature and mature AMI. Hyperlipidemia was the most prevalent risk factor in both groups. Smoking was much more common as risk factor in pre-mature patients with odd ratio of 6.29. Pre-mature AMI patients presented with ST elevation more often than older patients and pre-mature ones usually presented with single vessel disease on angiogram. More intensive primary prevention and even ban of smoking may be useful in order to decrease the incidence of pre-mature AMI.

34.

Level of Congestive Heart Failure Knowledge in Patients Discharged with Congestive Heart Failure

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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 50% of patients readmitted or died within 6 months. There are numbers of preventable causes of rehospitalization for CHF, including, noncompliance with medications or diet, failure to recognize early symptom of disease, and failure to seek medical attention promptly when symptoms recur. Better CHF knowledge may help reducing the CHF readmission.

Objective: To assess the level of CHF knowledge in patients discharged with CHF,

Method: Patients recruited into CHF HOME program from Jan to 28th Feb 2009 were recruited into the study. Questionnaire about the disease nature, early signs and symptoms, concept of diet and drug compliance and self management was used to assess patients' knowledge before and after education.

Results: 97 patients were recruited into the study. The overall level of CHF knowledge was not satisfactory. Scores in questionnaire after education were increased in all fields especially in the disease nature (correct answer 13.8% pre education vs 98.9% post education), diet control (correct answer 73.4% vs 98.5% post education), early signs and symptoms (correct answer 37% vs 100% post education).

Conclusions: Overall level of CHF knowledge was not satisfactory in patients discharged with CHF. Special emphasis in patients' education should be putted on patients discharged with CHF, especially in the aspect of recognition of early signs and symptoms of CHF, which may help reducing the CHF readmission.

35.

An Open-Label, One-Arm, Multicentre Study to Evaluate the Hemodynamic Changes and Safety of Nesiritide for the Treatment of Subjects with Acutely Decompensated Heart Failure in China

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Objective: Evaluate the efficacy and safety of intravenous infusion nesiritide for the treatment of decompensated acutely heart failure (ADHF) in china by monitoring the numerical change from baseline in hemodynamics parameters with the Swan-Ganz Catherter.

Methods: An open-label, one-arm, multicenter clinical study was carried out by five China cardiovascular clinical research centers. All subjects presented with dyspnea at rest or minimal exertion caused by heart failure for which inpatient parenteral therapy is deemed appropriate at entry. Subjects must have clinically evident estimated elevated cardiac filling pressures, and a measured PCWP must be more than 20 mmHg baseline. A total of 40 patients characterized of ADHF were enrolled in this study, among which 30 were male while 10 were female. Their average age was 59.9 years. 29 of them were NYHA III and 11 were IV. The process of monitoring the hemodynamics parameters were conducted with the Swan-Ganz Catherter. All the patients received nesiritide at an IV bolus of 2ug/kg (approximately 60 seconds), followed by IV infusion at the flow rate of 0.01ug /kg/min for 24hours.

Results: All patients enrolled in the study finished the treatment. The result showed the PCWP, PAP, RAP was significantly descended compared to the baseline, and CI was dramatically increased($P<0.05$). After using nesiritide, BP, HR, respiratory rate at each scheduled time were decreased ($P<0.05$). With respect to the tolerance and safety, there was no patient withdrawn from the study due to adverse event; no death case occurred in the study. There was no severe adverse effect during the study. Compare to base line, there were no difference in statistics in AST, ALT, creatinine, BUN, Glu, total protein, potassium, chlorine in plasm at the 24 hour after using drug.

Conclusions: Nesiritide can obviously improve the hemodynamics parameters, dyspnea, global clinical status. All subjects can tolerate. There is no severe adverse effect during the study.

ABSTRACTS

Abstracts for Free Paper Session:

36.

Outcome of Out-patients Referred for Cardiac Transplantation Evaluation – Impact of Device-based Heart Failure Therapy

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Purpose: Cardiac transplantation (CT) is an accepted treatment for selected patients (pts) with end-stage heart failure (HF). Access to CT is limited owing to organ shortage, which has forced the implementation of strict guidelines for accepting as transplant candidate. Little is known about outcome of HF pts who receive alternative treatment strategy while on waiting list.

Methods: A retrospective analysis of all outpatients with advanced HF who were referred between January 2005 and December 2008 for consideration of CT was performed. Only pts evaluated in an outpatient setting were included in this study. All pts were assessed by specialist cardiologists before presentation to the transplant selection committee for final deposition.

Results: A total of 72 pts (mean age 41 ± 11 years; 67% men) were evaluated during the study period. Five pts were referred for high risk aortic valve replacement (n=3) and coronary interventions (n=2) respectively with satisfactory outcome. Forty-two (58%) pts were enlisted for CT and only 13 (18%) of pts initially referred have been transplanted to date. Nine pts (12%) died waiting and 15 (21%) have been delisted: 13 pts improved after implantation and /or optimization of cardiac resynchronization (CRT) devices and 2 pts requested delisting. Despite significant clinical improvement in the 13 CRT responders, 2 pts with CRTP died from sudden cardiac death. Another 5 pts were CRT “non-responder”: 3 pts underwent CT and 2 pts died waiting.

Conclusions: This report illustrates the limitation of CT as treatment for advanced HF and the benefits of identifying potential candidates for alternative effective strategies. Vigilant follow-up including risk stratification for sudden cardiac death and optimization of HF therapy/devices are important.

ABSTRACTS

Abstracts for Free Paper Session:

ARRHYTHMIA, CARDIAC PACING AND IMPLANTABLE CARDIOVERTER DEFIBRILLATOR

37.

Early Pacing Induced Systolic Dyssynchrony and Long-term Left Ventricular Adverse Remodeling in Patients with Preserved Ejection Fraction Receiving Right Ventricular Apical Pacing – A Prospective Study
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Purpose: It was aimed to examine if the long-term adverse left ventricular (LV) remodeling occurs after right ventricular apical (RVA) pacing and its relation with pacing induced LV systolic dyssynchrony.

Methods: This study prospectively recruited 62 patients with preserved LV ejection fraction who received RVA pacing. Real-time 3D echocardiography (RT3DE) and tissue Doppler imaging (TDI) (iE33, Philips) were performed at baseline, 1 month and 1 year. LV remodeling was defined as an increase in LV end-systolic volume of $\geq 15\%$ at 1 year while pacing induced systolic dyssynchrony at 1 month was tested by RT3DE (Tmsv16-SD ≥ 16 ms) and TDI (Ts-SD ≥ 33 ms).

Results: Pacing induced systolic dyssynchrony was present in 30 patients when assessed by RT3DE and 30 patients by TDI at 1 month after RVA pacing. The concordance rate of the 2 methods was 80%. By using either method to define systolic dyssynchrony, the increase in LV volume with decline in ejection fraction at 1 year was only observed in the group with dyssynchrony (Table). At 1 year, LV adverse remodeling was observed in 30 patients (49%), which was also more prevalent in the group with dyssynchrony (by RT3DE: 70% vs 26%, $\chi^2=11.9$, $p=0.001$; by TDI: 76% vs 19%, $\chi^2=19.2$, $p<0.001$). In addition, Tmsv16-SD ($\beta=0.45$) and Ts-SD ($\beta=0.45$) at 1 month independently predicted LV adverse remodeling at 1 year (both $p<0.001$) using multiple regression analysis.

Conclusion: Long-term deleterious remodeling occurred in not all but nearly half of the patients who received RVA pacing. This was predominant in those who developed early evidence of LV systolic dyssynchrony as evident by either RT3DE or TDI.

	Baseline	1 year	p	Baseline	1 year	p
	<i>Without dyssynchrony by RT3DE (N=32)</i>			<i>With dyssynchrony by RT3DE (N=30)</i>		
LV end-diastolic volume, ml	66±16	64±15	NS	75±19	81±27†	0.025
LV end-systolic volume, ml	25±9	25±9	NS	32±12	43±19*	<0.001
LV ejection fraction, %	61±6	60±7	NS	58±10	49±9*	<0.001
	<i>Without dyssynchrony by TDI (N=32)</i>			<i>With dyssynchrony by TDI (N=30)</i>		
LV end-diastolic volume, ml	68±16	65±15	NS	74±20	80±28†	0.014
LV end-systolic volume, ml	27±9	25±9	NS	31±13	43±20*	<0.001
LV ejection fraction, %	61±7	61±7	NS	58±9	48±8*	<0.001

* $p<0.001$; † $p<0.01$ vs. the group without dyssynchrony.

38.

Left Ventricular Apical Aneurysm Induced by Permanent Right Ventricular Apical Pacing: Clinical Characteristics and Long-Term Outcomes

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Background: Right ventricular apical (RVA) pacing can induce left ventricular (LV) dyssynchrony and impairment of LV function. We report the prevalence, clinical characteristics and outcomes in a cohort of patients who developed LV apical aneurysm after permanent RVA pacing.

Methods: We studied 368 consecutive patients with permanent RVA pacing for high degree atrioventricular block without pre-existing structural heart diseases follow-up in our clinic. LV apical aneurysm was identified by cardiac catheterization in those patients developed new-onset heart failure, chest pain or ventricular arrhythmia after RVA pacing.

Results: Among 368 patients (mean age 69 ± 14 yr, male 52%), 32 of them underwent cardiac catheterization. Ten patients with normal coronary angiogram were noted to have LV apical aneurysm demonstrated by left ventriculogram and have a lower LV ejection fraction (40.7 ± 15.1 vs. $54.3\pm 15.7\%$, $p=0.04$) compared to those without. After a mean follow up of 7.5 years, 3 pts with RVA pacing induced LV apical aneurysm developed ventricular arrhythmia and cardiovascular mortality occurred more commonly in this group of pts compared to those without (30% vs. 6.3%, $p=0.027$). Cox-regression multivariate analysis revealed that age (Hazard Ratio [HR]=1.05, $p<0.03$), new onset heart failure (HR=2.84, $p=0.01$), and RVA pacing induced LV apical aneurysm (HR=3.59, $p=0.05$) were independent predictors of cardiovascular mortality.

Conclusion: We hereby describe the clinical features of a novel syndrome with left ventricular apical aneurysm induced by right ventricular apical pacing. Patients with this entity have a high cardiovascular mortality and therefore early recognition may alter clinical practice and surveillance.

39.

Role of Functional Mitral Regurgitation in Left Ventricular Reverse Remodeling after Cardiac Resynchronization Therapy

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Objectives: To examine whether the presence of pre-pacing functional mitral regurgitation (MR) and its improvement would affect the extent of left ventricular (LV) reverse remodeling after cardiac resynchronization therapy (CRT).

Methods: This study consisted of 83 patients, of whom 48 patients had more than mild MR and 35 showed no MR at baseline. Echocardiography was performed at baseline and 3 months for changes in MR and LV reverse remodeling. MR volume was computed by the continuity equation method.

Results: At 3 months after CRT, there was reduction in MR volume (38 ± 20 vs. 33 ± 21 ml). LV reverse remodeling was observed with decrease in LV end-systolic volume (LVESV) (123 ± 48 vs. 102 ± 50 ml, $p<0.001$). The changes in MR volume ($r=0.664$, $p<0.001$) was significantly correlated with changes in LVESV. The improvement in total MR volume of $\geq 11\%$ predicted LV reverse remodeling with a sensitivity of 90% and a specificity of 80% (AUC: 0.85, $p<0.001$), which was also significant in multivariate analysis. When compared for the extent of reduction in LVESV, it was greatest in patients with significant reduction in MR (defined as $\geq 11\%$ reduction in MR volume) ($n=23$, $-29.8\pm 12.0\%$), least in patients without significant reduction in MR ($n=25$, $-5.5\pm 8.6\%$) and intermediate in patients without baseline MR ($n=35$, $-18.6\pm 16.6\%$) (all $p<0.05$). The corresponding response rate (define as $\geq 15\%$ reduction in LVESV) was 91.3%, 20.0% and 54.3% respectively in the 3 groups ($\chi^2=24.54$, $p<0.001$).

Conclusion: The extent of LV reverse remodeling is dependent on whether patients had pre-implantation MR. Also, reduction of functional MR contributed to LV reverse remodeling after CRT.

40.

Left Ventricular Reverse Remodeling Achieved by Cardiac Contractility Modulation – A Comparative Study with Cardiac Resynchronization Therapy in Different QRS Durations

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Purpose: Cardiac contractility modulation (CCM) is a new form of device-based therapy for patients with advanced heart failure with normal QRS duration and therefore not candidates for cardiac resynchronization therapy (CRT). Left ventricular (LV) reverse remodeling has been reported in both therapies, however, it is unknown if the extent of response is similar between CCM and CRT.

Methods: This study recruited 120 patients with NYHA class III or IV heart failure and LV ejection fraction $< 35\%$ despite optimal medical therapy. Gp 1: QRS < 120 ms received CCM; Gp 2: QRS < 120 ms received CRT; Gp 3: QRS 120-150ms received CRT; Gp 4: QRS > 150 ms with typical LBBB received CRT. The CRT groups were matched with the CCM group in age, gender and etiology of heart failure (Table). Echocardiography was performed at baseline and 3 months.

Results: As shown in table, a significant LV reverse remodeling was observed in all the 4 groups with reduction in LV end-systolic volume (LVESV). However, the favorable change was the greatest in Group 4 but similar in the other 3 groups. By using reduction of LVESV $\geq 15\%$, responder rate was the highest in Group 4, but was not different among the other 3 groups.

Conclusion: CCM appears to exert similar LV reverse remodeling response to CRT in normal and mildly prolonged QRS durations, but less effective than CRT in very wide QRS with LBBB.

	Gp 1: CCM Normal QRS	Gp 2: CRT Normal QRS	Gp 3: CRT QRS 120-150	Gp 4: CRT QRS > 150
Patient (male), n	30(24)	30(24)	30(19)	30(23)
Age, years	60±11	58±12	66±9	65±12
Ischemic etiology, n(%)	15(50)	16(53)	17(57)	13(43)
Baseline LVEDV, cm ³	160±41	171±44	194±89	210±78*
Baseline LVESV, cm ³	115±35	127±40	148±76	163±71*
Baseline LVEF, %	28.4±6.2	27.0±6.7	24.9±7.1	23.7±8.3
Change in LVESV, %	-11±12	-15±18	-13±20	-32±20 ^{1a}
Responder rate, %	37	43	43	77 ^{1a}

* $p<0.05$, ^{1a} $p<0.001$ vs Gp 1; ^b $p<0.05$ vs Gp 2; ^c $p<0.05$ vs Gp 3.

ABSTRACTS

Abstracts for Free Paper Session:

41.

Hospital based CPR training is as effective as advanced cardiac life support training (ACLS) - A retrospective review of resuscitation outcome in a tertiary referral, university affiliated hospital in Hong Kong
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Department of Medicine, Queen Mary Hospital, Hong Kong

Purpose: In-hospital cardiopulmonary resuscitation (CPR) providers are not always qualified ACLS provider. A hospital-based CPR training program based on the revised American Heart Association guideline in resuscitation published in 2005 was developed which targeted on medical staff. The purpose of the study is to compare the performance of this program with ACLS training.

Methods: The stated hospital-based CPR training started from January 2007. All episodes of CPR performed in medical ward since the implementation of the program were reviewed. Only the first arrest episode was analyzed for patients who had more than one arrest during the same hospital admission. The primary outcomes were differences in restoration of spontaneous circulation (ROSC) and survival rate between categories of ACLS trained CPR leader and hospital trained CPR leader.

Results: 264 CPR episodes were analyzed. The hospital discharge rate is 3% (8/264). Eleven per cent (30/264) of CPRs were performed by ACLS CPR team and 20.8% (55/264) CPRs were performed by Hospital training CPR team. The performance of both group was similar in terms of ROSC rate (ACLS 40% (12/30) vs Hospital training 29% (16/55) $p=0.59$), CPR response time (0 minutes vs 0 minutes, $p=0.29$), first defibrillation in case of VT or VF (2.5 (5/24) vs 12 minutes (2/24), $p=0.77$), first medication (2.5 vs 4 minutes, $p=0.53$) and time for intubation (13 vs 13 minutes $p=0.64$).

Conclusion: The sample size remains small. However, based on the available data, CPR provider with hospital training performed comparable CPR standard as ACLS provider, as evidenced by their similar CPR behaviors (defibrillation, intubation and administration of resuscitation medication) and short term survival. Quality hospital-based intensive training in resuscitation may be a reasonable alternative to ACLS training.

42.

Clinical profile for patients having Implantable cardioverter defibrillator for primary prevention of Sudden Cardiac Death
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Background: Implantable cardioverter defibrillator(ICD) as primary prevention for sudden cardiac death(SCD) is not uncommon among high risk cardiac patients. The prevalence of ICD therapy and outcome of patients having this treatment needs to be addressed in Hong Kong. In this study, we aim to look into these issues from our ICD registry.

Method: Patients having ICD for primary prevention were included. Their demographics, indications, co-morbidities and cardiac function were reviewed and analysed. The first ICD event was recorded and the causes for ICD firing were reviewed.

Result: There were totally 16 patients received ICD for primary prevention from November 2005 to November 2008. Their mean age was 65years(range 33-78years). Twelve patients were male(75%). The duration of follow up was up to 39.5 months. Ten patients (62.5%) had history of myocardial infarct or ischaemic heart disease, four patients (25%) had dilated cardiomyopathy (DCMP), two patients (12.5%) had hypertrophic cardiomyopathy (HCM). Their mean ejection fraction by echo was 32% (range 14-83%). Totally 5 patients had ICD firing during the follow up period. Two of the 5 patients had true firing for the first recorded events. Both of which were classified as ventricular tachycardia(VT). The remaining 3 patients, two had atrial fibrillation(AF) and one had supraventricular tachycardia (SVT). Four patients died during the follow up period, renal failure in 2, refractory heart failure (EF ~ 14%) in 1 and pneumonia in 1. The 2 patients who died of renal failure had recorded ICD firing before death and both had VT recorded. The patient who died of refractory heart failure had 1 ICD shock due to VT before death. The patient died of pneumonia had 4 episodes of firing recorded from ICD. This patient had HCM and had family history of SCD and his EF was 50%. Nine patients has electrophysiological study (EPS) done before ICD insertion. None of those patients had inducible VT/VF.

Conclusion: ICD is effective for primary prevention of SCD in selected high risk patients. SVT and fast AF are common causes of inappropriate ICD discharge. EPS has limited role for the prediction of ICD therapy and risk stratification in this patient population.

43.

Sudden Death in Hong Kong: An Analysis Using Press Information
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Purpose: Sudden death is a devastating form of condition that affect all age of people in Hong Kong but an effective tracking system is lacking and data is scarce. Newspaper coverage of sudden death cases can be utilised as a source of information for analysis.

Methods: Using the web search function of a local newspaper, the Apple Daily, the term "猝死" was used to search for matches from 2002 to 2005. Coverage of local cases of sudden death of subjects 1 to <80 year old were reviewed. Subject with congenital disease, other active severe or terminal diseases, illicit drug use, relating to extreme hot or cold weather were excluded.

Results: There were 219 relevant cases from year 2002 to 2005, 85% were male. 35% did not have any history of preceding illness. However, 17% were associated with upper respiratory tract symptom or gastroenteritis or fever. 10% were grossly obese (>200lb) and 8% had alcohol drinking. Most common site was at home (44%), and 35% happened while subjects were sleeping or resting. And about 21% happened during or after exercise, others activities included TV game, betting, sauna or commercial sex.

Conclusion: Press coverage of sudden death in local community can be utilised to obtain demographic and clinical information, but a robust community wide tracking system is needed to yield useful clinical data for intervention and prevention purpose.

ABSTRACTS

Abstracts for Free Paper Session:

VALVULAR HEART DISEASE, CARDIAC SURGERY AND CARDIAC REHABILITATION

44.

Specialized Anticoagulation Management Service for patients with valvular heart disease

SWK Lai¹, F Wong², C, Mo², L Chow¹, P Chu², KF Tse¹, CS Lam¹, PW Yam¹, ML Wong¹, WC Ko¹, WK Chan¹, KC Ko¹, YH Chan¹, WF Leung¹, KL Chui¹, H Lam¹, LL Ip¹. ¹Department of Medicine & Geriatrics, ²Department of Pharmacy, Tuen Mun Hospital.

Background: Warfarin is an essential medication for patients with mechanical heart valve or other conditions subjected to high risk of thromboembolism. However, the dose response varies among different patients due to various factors. Besides, it has narrow therapeutic windows and is subjected to interactions with drugs and diet. Specialized anti-coagulation management service had been shown to improve anti-coagulation control. **Method:** Anticoagulation clinic run by pharmacists with support from physicians was set up in Tuen Mun Hospital in February 2008. All patients were asked to have regular INR monitoring every 4 weeks. The outcome including anti-coagulation control and adverse event till Jan 2009 were studied. **Result:** Altogether there were 74 patients. 34 (45.9%) patients were male with mean age of 53 ± 11 year. Indications for warfarin treatment include 64 (86.5%) patients with mechanical heart valve, and 10 (3.5%) patients with atrial fibrillation and high risk of thromboembolism. 33 (44.6%) patients belongs to low intensity INR (LI) group (INR 2.0-3.0) and 39 (52.7%) belongs to high intensity (HI) group (INR 2.5-3.5). Their mean follow up interval were 7.5 ± 4.3 weeks. Overall, the percentage time in therapeutic range (TTR) was 73.3%. In the LI group, the TTR was 75.5% whereas in the HI group, the TTR was 66.7%. Altogether, there were 58 minor bleeding episodes including cutaneous bruising, translating into 1.25 per patient-year, and 2 patients had major bleeding due to hematuria and required hospital admission, translating into 0.4 per patient-year. There was no thromboembolic event. **Conclusion:** Specialized anti-coagulation clinic offers good anticoagulation control with high percentage of TTR and low bleeding risk.

45.

Infective endocarditis: Analysis of pathogenic bacterium and the clinical feature in prosthetic valve and native valve

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Purpose: To analysis the epidemiological characteristic and pathogenic bacterium of infective endocarditis (IE), and to compare the pathogenic microorganism and vegetation localization between the prosthetic valve endocarditis (PVE) and the native valve endocarditis (NVE).

Methods: The data were collected from in-patient who fulfilled Duke Criteria for IE from May 2005 to May 2008 in Fuwai hospital. The demographics, clinical data of 266 cases with IE were analyzed retrospectively.

Result: Among the 266 patients with IE, the mean age of patients was 39.5 ± 16.7 years, and the male gender predominated with a sex ratio of 1.96: 1. One hundred and one patients (38%) suffered from congenital heart disease. 62 patients (23.3%) suffered from rheumatic heart disease, and 77 patients (28.9%) suffered from non-rheumatic valvular heart disease. The congenital heart disease was increased, while rheumatic heart disease was decreasing. Two hundred and eighteen patients (82%) with vegetation were identified, and the most common vegetation localization was aortic valve, mitral valve, and aortic plus mitral valve in turn. Bacterial cultures were positive in 49.5 percent of patients. There wasn't marked change in the proportion of viridans streptococcus and staphylococcus aureus in pathogen of IE, but the proportion of Gram-Negative bacillus and Fungi had risen. The PVE group was 37 patients (13.9%), and the NVE group was 229 patients (86.1%). Detection rate of vegetation was lower in PVE group ($P < 0.01$), however the positive rate of bacterial cultures was higher ($P < 0.01$). Streptococcus, coagulase negative staphylococcus, gram-negative bacteria showed significant difference between the two groups ($P < 0.01$). The spectrum of microorganism was different between the early and the late PVE. The in-hospital mortality rate of PVE is higher than NVE.

Conclusion: The epidemiological feature and pathogenic bacterium of IE has changed obviously during the past years. Early diagnosis, promptly bacterial cultures, the effectively usage of antibacterial, and actively prevention of nosocomial infection seem to be effective.

46.

The Interaction of Human Urotensin II and Vasodilator Agents in Human Internal Mammary Artery: Clinical Implications

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Purpose: Graft spasm of the internal mammary artery (IMA) may occur after coronary artery bypass grafting (CABG) and reversal of spasm is still challenging. Human urotensin II (hU-II) is a cyclic peptide recently cloned in humans and present in human cardiac tissue and arteries, but its effects on IMA are still unclear. The purpose of this study was to investigate the in vitro vascular contractile properties of hU-II and the effect of calcium antagonists and glyceryl trinitrate (GTN) in IMA.

Methods: We studied 102 IMA rings from 46 patients undergoing CABG with organ bath technique. The interaction between hU-II and various calcium antagonists was investigated in two ways: relaxing effect of vasodilators on the hU-II-induced precontraction and the depressing effect of vasodilator agents on the contraction caused by pretreatment with hU-II.

Results: hU-II caused contractile response in all human IMA. Nifedipine induced full relaxation in potassium chloride-contracted (98.9 \pm 3.9%, n=6) and nearly full relaxation in hU-II contracted IMA rings (90.6 \pm 4.6%, n=6); Diltiazem nearly fully relaxed those IMA rings precontracted with potassium chloride and hU-II (92.7 \pm 6.0%, n=6; 95.1 \pm 2.1%, n=6). In potassium chloride-precontracted IMA rings, nifedipine was 18.6-fold more potent than diltiazem (EC50 -8.01 \pm 0.20 vs. -6.74 \pm 0.22 log M, $p < 0.01$); in hU-II-precontracted IMA rings, nifedipine was 6.2-fold more potent than diltiazem (EC50 -7.25 \pm 0.25 vs. -6.46 \pm 0.18 log M, $p < 0.05$). GTN caused nearly full relaxation (95.4 \pm 5.8%, n=6) but pretreatment with GTN failed to alter, while diltiazem and nifedipine pretreatment reduced subsequent contraction to hU-II.

Conclusion: The results suggested that hU-II is a potent vasoconstrictor and possible spasmogen in human IMA and that calcium antagonists and GTN relax the contraction caused by hU-II with different potencies. However, calcium antagonists are more effective in preventing the contraction induced by hU-II than GTN.

47.

Dual Actions of Cilnidipine in Human Arteries - Inhibition of Calcium Channels and Enhancement of Endothelial Nitric Oxide Synthase

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Objectives: Cilnidipine is a novel, long-action L/N-type dihydropyridine calcium channel blocker that has recently been used for antihypertensive therapy. We investigated the vasorelaxation effect of cilnidipine with regard to its calcium channel blockage and nitric oxide (NO)-cyclic guanosine monophosphate (cGMP) dependent mechanism in human internal mammary artery (IMA).

Methods: Fresh human IMA taken from discarded tissues of patients undergoing coronary artery bypass surgery. Concentration-relaxation curves to cilnidipine in comparison to nifedipine were studied. The expression level of eNOS mRNA was assayed by quantitative Real-Time PCR (qRT-PCR) and the phosphorylation of eNOS at Ser1177 was determined by Western blotting analysis.

Results: Cilnidipine and nifedipine caused nearly full relaxation in potassium-precontracted IMA. Pretreatment with cilnidipine at the clinical plasma concentration significantly depressed the maximal contraction. Endothelium-denudation ($47.7 \pm 7.0\%$, $p < 0.05$) and inhibition of eNOS ($48.6 \pm 6.1\%$, $p < 0.05$) or cGMP ($41.6 \pm 3.8\%$, $p < 0.01$) significantly reduced the cilnidipine-induced endothelium-dependent relaxation ($73.9 \pm 6.4\%$). Cilnidipine increased the expression of eNOS mRNA by 42.4% ($p < 0.05$) and enhanced phosphorylation level of eNOS at Ser1177 by 37.0% ($p < 0.05$).

Conclusion: The new generation of calcium channel antagonist cilnidipine relaxes human arteries through calcium channel antagonism as well as increase of production of NO by enhancement of eNOS. The dual mechanisms of cilnidipine in human arteries demonstrated in this study may prove particularly important in vasodilatory therapy in cardiovascular diseases.

ABSTRACTS

Abstracts for Free Paper Session:

48.

Human Urotensin II in Internal Mammary and Radial Arteries of Patients Undergoing Coronary Surgery and Clinical Implications

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Objectives: The present study compared the vasoreactivity of human urotensin II (hU-II) and its receptor in the major grafts for coronary surgery - the internal mammary (IMA) and radial artery (RA) and investigated the underlying mechanism.

Methods: Fresh human IMA and RA taken from discarded tissues of patients undergoing coronary bypass surgery were studied in organ baths. The expression of urotensin (UT) receptor was determined by RT-PCR.

Results: hU-II contracted IMA with pD_2 of 8.57 ± 0.41 and E_{max} of $45.4 \pm 9.1\%$ of that induced by 100 mM KCl, whereas caused less contractile responses in the RA (pD_2 : 8.30 ± 0.79 , E_{max} : $20.4 \pm 4.8\%$, $p < 0.05$). Nifedipine inhibited hU-II-contraction in IMA. In U_{46619} -precontraction, hU-II elicited comparable relaxation in the IMA (pD_2 : 8.39 ± 0.43 , E_{max} : $56.1 \pm 4.0\%$) and RA (pD_2 : 9.03 ± 0.46 , E_{max} : $65.2 \pm 7.1\%$). The relaxation was abolished by endothelium-denudation and by indomethacin, oxadiazoloquinolaxinone or N^w-nitro-L-arginine, oxyhemoglobin, and Ca²⁺-activated K⁺ channel blockers. UT receptor mRNA was detected in both arteries.

Conclusions: hU-II is an important spasmogen in the arterial grafts with expression of the UT receptor in IMA and RA. hU-II elicits a significant contraction and a moderate endothelium-dependent relaxation attributable to nitric oxide, PGI₂, and endothelium-derived hyperpolarizing factor and involving activation of K_{Ca} channels. The relaxant response of endothelium-intact IMA and RA to hU-II demonstrates the importance of preservation of the endothelial cells in these grafts.

49.

Six months' Outcome of patients in CHF-HOME (Congestive Heart Failure - Home Community, Monitoring and Exercise) Program

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Introduction: Congestive heart failure (CHF) is a growing public health problem in HK. In PYNEH, there is 66% of increase in admissions for CHF from 2001 to 2007. It is one of the leading causes of hospitalization in individuals who are older than 65-year-old. Readmission rate for CHF is very high, more than 50% of patients being readmitted within 6 months.

Objective: To improve the clinical outcomes 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, assess, intervene and monitor the selected patients who were admitted for CHF. The team provided in-patient clinical assessment, pre-discharge education and counseling, post-discharge management plan, telephone follow-up and enquiry service, early clinic follow-up. Clinical outcomes of patients being enrolled and not enrolled into this program were analyzed, i.e., 6-month readmission rate with CHF and length of stay. Clinical outcome of subgroup patients with recurrent CHF in this program was also analyzed (6 months' readmission with CHF before and after program).

Results: A total of 1275 patients were screened from 3rd October 2007 to 30th September 2008. 256 patients were enrolled into this program, of which 55% of them with history of recurrent admission for CHF. Their mean age was 73.99 years. Clinical outcomes were as follows:

	Patients enrolled in this program	Patient not enrolled in this program	P value
Numbers of patient	256	1019	
6-month readmission rate for CHF	46%	63%	<0.001
Length of stay	3.9 days	6.7 days	

Subgroup analysis: 6-month readmission rate of 141 patients with history of recurrent CHF before and after enrollment in this program

	Before enrollment	After enrollment	P value
6-month readmission rate for CHF	69%	55%	0.02

Through this program, 6-month readmission rate of patients with CHF can be reduced by 37%. Length of stay for readmission with CHF can be reduced by 42%. 575 bed days were saved with this program.

Conclusion: CHF-HOME Program improves the clinical outcomes of patients with CHF, and reduces hospital admission and resources utilization.

50.

Success Rate of Cardiac Patients that Referred for Smoking Cessation

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Purpose: To determine the cessation rate of cardiac patients who were smokers and referred to smoking counselling and cessation programme (SCCP).

Method: Phone follow up were made at least 1 month after referral to SCCP. Patients self-reported their smoking habit.

Results: 58 smokers (55 males) were identified and agreed to join SCCP. Among them, 23 (40%) and 35 (60%) were referred from cardiac ward and specialty outpatient clinic, respectively. Their mean age was 58.3 (range 30-80, SD=11.4) years. Those patients had been smoking from 8 to 63 (mean 39.4, SD=12.2) years with an average consumption of 13.5 (range 2-70, SD=10.0) cigarettes/day. Phone follow-up was failed in 13 patients. At a result, 45 patients were studied. Four patients had visited those clinics for counselling service. Eleven out of 12 patients who quit smoking were referred in cardiac ward. They quit smoking immediately following their discharge from hospital. Seventeen (38%) patients reported a reduction in daily cigarette consumption to 8.3±6.0 cigarettes/day. Most smokers reported that they acknowledged the hazards of smoking but preferred to reduce in consumption instead, and they sustained smoking because of negative feeling or stress. Five smokers mentioned that they would consider quitting smoking due to recent drastic tobacco tax hike.

Conclusion: The above findings showed that most patients (91%) refused to visit smoking counselling and cessation centres for counselling service. Cessation rate (11/45, 24.4%) were higher in patients following acute cardiac events. The appropriate time for referral to counselling service should be explored to improve the success rate of patients in smoking cessation.

51.

Characteristics of Heart Failure Patients that Refuse Self-Monitoring Training in Heart Failure Rehabilitation Program

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Purpose: To review the characteristics of heart failure (HF) patients that refused to participate in self-monitoring training in heart failure rehabilitation program (HFRP).

Methods: Assessment and education were provided to HF patients during phase I HFRP. A form was designed to guide the management and record relevant data. Eligible HF patients would be provided with self-monitoring training after detailed screening. Data were analyzed for their characteristics.

Results: From June 2006 to Feb 2007, 124 (94 males, 76%) HF patients were recruited into HFRP. Their mean age was 72.9 years (SD=10.2 years). Among them, 58 patients (47%) did not participate in self-monitoring training with reasons including not keen for training, unwilling to buy scale and/or sphygmomanometer, unwilling to do home monitoring and daily record were reported in 31, 38 and 41 patients, respectively. Patients with and without training were compared in the table below:

	Training (n=66)	Refuse training (n=58)	p value
Mean age	70.8 ± 10.5 years	75.3 ± 9.4 years	0.015
Complete home-based rehabilitation	16 (24%)	7 (12%)	0.125
Education up to primary level	47 (71%)	53 (91%)	0.005
History of coronary artery disease	32 (49%)	18 (31%)	0.114
Have regular exercise habit	26 (39%)	15 (26%)	0.110
Never smoke	38 (58%)	28 (48%)	0.300
With spouse	51 (77%)	38 (66%)	0.147

Conclusion: The findings showed that patients that were younger, married, with higher education level, regular exercise habit and did not smoke were more ready to accept self-monitoring training. For those who refused, alternative strategies should be explored to support them in comprehensive heart failure management.

ABSTRACTS

Abstracts for Free Paper Session:

52.

Explore Patients' Preferences for Programs that Sustain Cardiac Benefits in Cardiac Rehabilitation

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Purpose: Long-term maintenance of physical activities and lifestyle modification are important components to be sustained for cardiac patients having cardiac rehabilitation (CR). Despite effort dedicated to the promotion of community-based CR, the participation rate was low. A hospital-based one year follow-up plan was designed to evaluate patients' outcomes following completion of Phase II program. Reinforcement activities to support continuity in rehabilitation were considered in the program. The purpose of this study was to explore patients' preference for program features.

Methods: Patients who completed phase II CR in Year 2008 and attended the graduation party were invited to complete a questionnaire. Questions regarding the necessity, the appropriate period to introduce the service, number of sessions, the time of operation, the contents and the cost for service fee and treadmill test were asked. The result was compared with the current service offered by two non-government organizations in the community.

Results: Fifty convenience samples were studied with 44 (88%) patients agreed that the program was necessary. Among 44 patients, 23 (52%) patients reported that the course held at one year after graduation was too long, 3 patients suggested that the program should be held as early as 3 months after graduation. Nineteen out of 32 patients (59%) who gave suggestions on number of sessions to be limited to not more than 6 sessions of training. There was no preference to morning or afternoon (20 Vs 24 patients) session. Patients referred the contents should include medications, qigong practice, exercise, signs and symptoms on complications, self-management skills and group sharing were reported in 22, 22, 21, 18, 9 and 5 patients respectively. Twenty-seven (54%) and 35 (70%) patients accepted to the cost for attending the class and for treadmill test to evaluate their exercise capacity respectively. When compared with program features with those provided by community partners, similar programs existed.

Conclusions: Most patients agreed that maintenance program was necessary for sustaining the benefits from cardiac rehabilitation. Patients' preferences in the program features were comparable to service provided by community-based organizations. Strategies at the transition phase from II to III should be explored to achieve the above.

ABSTRACTS

Abstracts for Free Paper Session:

CARDIAC IMAGING AND ECHOCARDIOGRAPHY

53.

Prognostic value of normal cardiac magnetic resonance imaging in patients with known or suspected ischemic heart disease

Dr KC Chan, Dr WS Kwan, Dr YH Cheng, Dr SF Chui, Dr LK Chan, Dr CY Wong, Dr HS Ma, Dr CL FU, Dr LY Tam, Dr CW Chan, Dr KY Lee, Dr KT Chan, Dr KC Ho, Dr CS Chiang
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Background: Cardiac magnetic resonance imaging (CMRI) was accurate in assessing cardiac function and structure, diagnosing obstructive coronary artery disease (CAD) and detecting myocardial fibrosis/scar. Apart from diagnostic accuracy, prognostic study of CMRI was limited as compared to SPECT and PET.

Objective: This study is to assess the prognostic value of normal CMRI in patients with suspected and confirmed CAD in a tertiary referral centre.

Patient and methods: Patients with suspected and confirmed CAD referred for CMRI from 10th October 2005 to 31st September 2008 were recruited. Baseline clinical characteristics, cardiac risk factors, use of cardiac medication will be analyzed. Composite end point of cardiac events including cardiac death, nonfatal myocardial infarction and coronary revascularization were recorded. Follow up was completed in 31st December 2008. Negative predictive values of various CMRI parameters were analyzed.

Result: 120 patients with a normal CMRI were recruited and were followed up with a mean duration of 19.6 months. Baseline clinical characteristics were shown on table 1. 3 patients experienced the composite end point (2.5%). There were no cardiac death, 1 nonfatal myocardial infarction and 2 patients had undergone revascularization procedure. The negative predictive value of CMRI in predicting any future adverse cardiac event, cardiac death, nonfatal myocardial infarction and revascularization were 97.5%, 100%, 99% and 98% respectively.

Conclusion: Excellent prognosis was noted in patients with a normal CMRI.

Table 1

Male Sex	74(62%)	Hyperlipidaemia	65(54%)
Age	59(SD +/-12)	Smoking	24(20%)
IHD	56(47%)	Renal impairment	15(13%)
Hx of AMI	3(2.5%)	Aspirin	65(54%)
Hx of PCI	22(18%)	Beta blocker	32(27%)
Hx of CABG	3(2.5%)	ACE/ARB	27(23%)
Dm	24(20%)	Statin	49(41%)
HT	58(48%)	Ca Channel blocker	8(6.7%)

54.

The prognostic implication of detection of silent myocardial ischaemia and myocardial infarction by cardiac magnetic resonance imaging in diabetic patients

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Background: Previous studies have shown that silent myocardial infarctions (MI) are prevalent among diabetic patients and its presence signified morbidity and mortality. Cardiac magnetic resonance imaging (CMR) provides comprehensive assessment in myocardial perfusion reserve and characterization of myocardial scar by delay contrast imaging (DHE). **Purpose:** We hypothesize that CMR perfusion study and identification of silent MI has prognostic significance in diabetic patients. **Methods and Results:** Totally 170 clinical indicated diabetic patients underwent CMR adenosine perfusion and DHE. CMR imaging and follow-up were successful in 164 patients (M: F= 101:63). Cox regression analyses were performed to associate the presence of myocardial ischemia by positive adenosine perfusion study and DHE with major cardiovascular events (MACE), including death, acute MI, new congestive heart failure or unstable angina, stroke and significant ventricular arrhythmias between the study groups Vs control group (n=114 Vs n=50) respectively. At a median follow-up of 26 months, positive myocardial perfusion defect and DHE was presence in 32% (36 of 114 patients) and 26% (30 of 114 patients) experienced MACE respectively. The presence of DHE was associated with a 3.5 fold hazards increase for MACE (hazard ratio, 3.5; p=0.01). The presence of perfusion defect was associated with a 2.5 fold hazards increase for MACE (hazard ratio, 3.1; p=0.04). Adjusted with other clinical risk factors, left ventricular ejection fraction and myocardial perfusion imaging, DHE was the strongest multivariable predictor of the development of MACE.

Conclusion: CMR adenosine myocardial imaging and DHE for the identification of silent MI provide incremental value in the prognostication of diabetic patients.

55.

Comparison of prognostic value of computed tomography coronary angiogram and adenosine cardiac magnetic resonance perfusion imaging in patients presented with chest pain

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Background: Computed Tomography coronary angiogram (CTA) provides a noninvasive mean to accurately assess the coronary anatomy while adenosine cardiac magnetic resonance perfusion imaging (CMR) provides reliable functional assessment of ischaemic myocardium. **Purpose:** To compare the predictive value in development of CAD or future adverse cardiac events (MACE) by CTA and CMR in patients (pts) with low to moderate total number of cardiac risk factor (TLCRF). **Methods:** Adenosine stress CMR and CTA was performed on 268 consecutive patients (pts) who presented with chest pain. Ten pts and thirteen pts were excluded due to MI and poor image quality respectively. Pts were followed up during to determine the incidence of significant, new MI, heart failure, unstable angina or cardiovascular death. **Results:** Totally 245 pts (M:F = 189:56); mean age 58±14; mean baseline TLCRF= 2.5±1) underwent rest and stress adenosine stress CMR and 64 slices CTA on the same day. At 31±6 months, there were 30 MACE (25 pts underwent coronary percutaneous angioplasty due to unstable angina, 1 new MI, 3 cardiovascular deaths and one heart failure). Despite TLCRF and abnormal CMR & CTA defined as stenosis per vessel ≥ 50% can significantly predicting the prognostic outcome (TLCRF: CMR: CTA= 0.01:0.001:0.001 respectively). Abnormal CMR and CTA are the strongest predictor of the event rate (adjusted hazard ratio 1.46 per 10% increase, p = 0.03 Vs p=0.04). However, there is no difference in prediction of MACE for the abnormal CMR and positive CTA (p=0.2). Nevertheless, among pts with 50-75% stenosis per vessel on CTA, event rate were significantly lowered in pts with negative CMR (p<0.001). **Conclusions:** Among the low to moderate cardiac risk chest pain pts, adenosine CMR perfusion and CTA are equally good in predicting the future development of significant CAD.

56.

Complementary role of adenosine stress perfusion and late gadolinium enhancement imaging by cardiac magnetic resonance in prognostication of low to moderate cardiac risk patients

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Background: Recent studies have shown the prognostic implication of cardiac magnetic resonance (CMR) perfusion imaging using stress agents in patients (pts) with suspected coronary artery disease (CAD). On the other hand, the CMR late enhancement imaging (DHE) have been proven to be the most sensitive method of identifying the presence of myocardial infarction (MI). We postulate that there is a complementary role of CMR perfusion imaging and DHE in prognostication of pts with suspected CAD. **Methods:** CMR was performed on 520 consecutive pts who are presented initially with chest and suspicious of myocardial ischaemia and no previous history of MI. The CMR study protocol consists of assessment of myocardial function, adenosine & rest perfusion and DHE imaging. Ten pts were excluded due to suboptimal image quality. Pts were followed up during outpatient visits or contacted through telephone interview to determine the presence of MACE (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 510 pts (M:F = 380:130); mean age 60±14; mean number of cardiac risk factors (TCF) (= 2.3±1) underwent CMR. At a mean followup 30±8 months, 43 pts underwent coronary percutaneous angioplasty due to unstable angina, 3 new MI, 2 heart failure and 4 cardiovascular deaths. Despite the number of TCF and left ventricular systolic function, inducible myocardial perfusion defect was the strongest multivariate predictor to major adverse effect with 6-fold hazard increase to MACE (p<0.0001) and a 4-fold increase to cardiac death (p=0.04). Adjusted to the presence of reversible myocardial effects, DHE maintained a 3-fold adjusted hazards with MACE (adjusted HR 4.3, p=0.02). **Conclusion:** In pts without history of MI, adenosine inducible myocardial perfusion defect and DHE provided complementary incremental prognostic information in daily practice.

ABSTRACTS

Abstracts for Free Paper Session:

57.

Early experience in CT coronary angiogram in a regional hospital

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Background: CT coronary angiography service was first launched in Yan Chai Hospital since April 2008 with a 64-slice Toshiba Aquilon. Early experience was reported in this review.

Methods: 43 CT coronary angiograms performed from April to end of October 2008 were studied. Most of the angiograms are dedicated for cases with low probability of coronary artery disease (CAD) for dual purpose of screening for invasive procedures and overcoming the initial learning curve.

Results: The results of 43 CT coronary angiograms were reviewed. Among the 43 patients, no blockage in coronary arteries were found in 23 patients (23/43, 54%). All of them had low calcium score of less than 50 (zero in 19 patients). For the rest 20 patients, results were tabulated as follows:

	Mild	Moderate	Severe
Left main	0	1	0
Left anterior descending (LAD)	9	6	12
Left circumflex (LCx)	7	2	4
Right coronary (RCA)	4	8	2

Only 5 patients (A to E) underwent coronary angiograms +/- percutaneous coronary intervention (PCI):

	CT coronary	Coronary angiogram	Outcome
A	Triple vessel disease	Triple vessel disease	Bypass surgery
B	Near total occlusion proximal LAD	Ostial LAD chronic total occlusion	Medical therapy
C	Mid to distal LAD severe stenoses	Mid to distal LAD severe stenoses	PCI to mid-distal LAD with 2 bare metal stents (BMS)
D	Proximal LAD and LCx severe stenoses	Ostial LAD/LCx, mid LCx, proximal-distal RCA critical stenoses	Bypass surgery
E	Mid LAD severe stenosis	Mid LAD severe stenosis	PCI mid LAD with 1 BMS

Other significant findings include anomalous origin of RCA from L. coronary cusp, additional RCA arising from R. aortic coronary cusp, dense calcification in posterior leaflet of mitral valve and LVH.

Conclusion: CT coronary angiogram offers excellent anatomic diagnosis, grading in severity of CAD and correlation with invasive coronary angiogram finding. It also gives information that could not possibly be seen in cardiac catheterization. It will be an excellent tool in guiding patient management in the future era of treating patients with CAD.

58.

CT coronary Club – a meet between radiologists and cardiologists

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Background: CT coronary angiography service was first launched in Yan Chai Hospital since April 2008 with a 64-slice Toshiba Aquilon. On 19 December 2008, the inauguration meeting of YCH CT coronary club was held aiming for regular meeting for CT coronary cases discussion between radiologists and cardiologists.

Methods: 43 CT coronary angiograms performed from April to end of October 2008 were reviewed. The meeting was focused on 5 cases for which coronary angiograms had been performed. It was followed by an active interflow between the cardiologists and radiologists.

Results: The concerns of both parties were summarized for simplicity and grouped into the following 5 areas for each specialty. On the radiologists' side, they are concerned about: 1. What angiographic imaging angles are used frequently by cardiologists such that they could produce similar and familiar images to assist accurate diagnosis and intervention. 2. To what extent the severity of lesions are required before consideration of intervention. 3. What format in reporting the lesion severity would cardiologists appreciate? 4. What additional information will cardiologists be interested at? 5. Is CT perfusion imaging helpful? On the cardiologists' side, they are concerned about: 1. Could CT coronary imaging able to pick up critically narrowed lesion and characterize them by cross-sectional view or sort of "ICUS" view simulating intracoronary ultrasound. 2. Availability of CT coronary imaging in ruling out severe coronary artery disease in patients with suspected acute coronary syndrome. 3. Assistance from radiologists in bringing out the best images to delineate the specific lesion so that prior planning in tackling the lesion could be designed. 4. Radiation safety in CT coronary angiography. 5. Would triple rule out reliable with CT coronary angiography per se. The above questions were well addressed on an interactive basis by both sides.

Conclusion: Regular meetings for CT coronary cases discussion would be of utmost importance in advancing the technology by input from both radiologists and cardiologists and which will translate into clinical benefit in patient management.

59.

Left Ventricular Dyssynchrony as Determinant of Mitral Regurgitation in Patients with Ischemic Left Ventricular Systolic Dysfunction

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Objective: To assess the effect of left ventricular (LV) systolic dyssynchrony on the severity of ischemic mitral regurgitation (MR) in patients with left ventricular systolic dysfunction.

Methods: Eighty patients with ischemic LV systolic dysfunction (ejection fraction [LVEF] <50%) and at least mild MR were evaluated. The severity of MR was evaluated as effective regurgitant orifice area (EROA) by PISA method. Indices of mitral deformation (tenting area, mitral annular contraction), LV global systolic function (LVEF, LV +dp/dt), LV global remodeling (end-systolic volume [LVESV], sphericity index), LV local remodeling (papillary-fibrosa distance), and tissue Doppler-derived dyssynchrony index (Ts-SD, defined as the standard deviation of time to peak myocardial systolic velocity of six basal and six mid LV segments) were measured.

Results: Comparison between patients with and without significant LV systolic mechanical dyssynchrony (defined by a cutoff value of Ts-SD >33ms) showed that, EROA (0.22±0.14 vs 0.13±0.09 cm², p=0.003) and tenting area (2.51±0.80 vs 2.06±0.52 cm², p=0.003) were significantly larger in patients with LV systolic dyssynchrony, while the other variables showed no significant difference. By univariate analysis, LVEF (r=-0.323, p=0.004), LVESV (r=-0.367, p=0.001), tenting area (r=0.682, p<0.001) and Ts-SD (r=0.364, p=0.001) were found to be correlated with EROA. While no significant correlation was found between EROA and other variables. By multivariate analysis, tenting area (r²=0.66, β=0.666, p<0.001) and Ts-SD (r²=0.66, β=0.238, p=0.033) were found to be independent determinants of EROA.

Conclusion: In patients with ischemic LV dysfunction, the severity of ischemic MR is determined by mitral deformation as reflected by the increase in mitral valve tenting area as well as severity of LV systolic dyssynchrony.

60.

Subclinical Ventricular Dysfunction Identified by Tissue Doppler Imaging in Chronic Obstructive Pulmonary Disease before Development of Pulmonary Hypertension

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Purpose: Heart failure has been reported in patients with chronic obstructive pulmonary disease (COPD). However, it is unknown if subclinical impairment of cardiac function exists before occurrence of pulmonary hypertension.

Methods: Sixty-seven patients (72±8 yrs, 60 men) with stable COPD (no acute exacerbation in the past 3 months) and no evidence of pulmonary hypertension [pulmonary artery systolic pressure (PASP) <35mmHg] who had no history of heart failure were compared with 50 healthy subjects. Tricuspid annular motion displacement, peak systolic (Sm) and peak early diastolic (Em) velocity in basal right ventricular (RV) segment as well as the mean values of 6 basal left ventricular (LV) segments were measured by color tissue Doppler imaging (TDI).

Results: There was no difference in PASP and RV ejection fraction between the 2 groups. LV ejection fraction was slightly lower in COPD, which was <50% in only 1 patient. On the contrary, TDI showed significant reduction in tricuspid annular motion displacement, Sm and Em velocities in LV and RV basal segments (Table). The extent of decline in Em (34 to 42%) was greater than that of Sm (11 to 13%). When the cutoff values were derived from the controls (-2SD from mean) for Sm and Em, the prevalence of systolic and diastolic dysfunction in COPD patients was 24%, 38% for LV, and 14%, 22% for RV, respectively.

Conclusion: By using TDI, early asymptomatic impairment of LV and/or RV function was evident in patients with COPD before development of pulmonary hypertension.

Parameter	Controls	COPD	P value
PASP, mmHg	19.7±9.7	18.0±9.5	0.364
RV ejection fraction, %	59.1±8.0	59.6±8.1	0.781
Tricuspid annular motion displacement, mm	22.9±2.9	17.7±4.1	<0.001
Sm in basal RV segment, cm/s	9.9±1.4	8.8±2.2	0.001
Em in basal RV segment, cm/s	9.4±2.3	6.2±2.2	<0.001
LV ejection fraction, %	68.2±4.5	63.2±7.3	<0.001
Mean Sm in 6 basal LV segments, cm/s	6.4±1.0	4.4±1.4	<0.001
Mean Em in 6 basal LV segments, cm/s	7.9±1.7	4.6±1.7	<0.001

ABSTRACTS

Abstracts for Free Paper Session:

61.

Reduction of Radial Strain Revealed by Two-dimensional Speckle Tracking in Hypertensive Left Ventricular Hypertrophy: An Early Sign of Systolic Dysfunction?

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Purpose: The advanced two-dimensional (2D) speckle tracking echocardiography permits the assessment of different components in myocardial contraction. This study examined if this tool is useful for early detection of myocardial dysfunction in hypertension before clinical symptom occurs.

Methods: This study recruited 30 hypertensive patients (HTN) with left ventricular hypertrophy but no history of congestive heart failure, 30 patients with systolic heart failure (SHF) and 30 normal controls. 2D images were saved in short-axis views at basal, mid and apical left ventricular (LV) levels (Aplio 80, Toshiba) where the circumferential strain (ε-circ), radial strain (ε-radial) and torsion were analyzed offline.

Results: In the whole study group, LV ejection fraction was found more closely correlated with ε-circ ($r=0.80$, $p<0.001$) than ε-radial ($r=0.66$, $p<0.001$), but only modestly with rotation ($r=0.56$, $p<0.001$). Despite identical LV ejection fraction between HTN patients and controls, ε-radial decreased significantly while LV filling pressure was slightly elevated by measuring transmitral E velocity over mitral annular E' velocity (E/E') in HTN patients. In patients with SHF, ε-circ, ε-radial and torsion were severely impaired with elevation of E/E'. (Table)

Conclusions: 2D speckle tracking is useful to identify subclinical LV myocardial dysfunction. As the global measure of ejection fraction is more reflecting circumferential function of the LV, the decrease in ε-radial may serve as an early sign of systolic dysfunction in HTN.

Parameters	Control	HTN	SHF
LV ejection fraction, %	63.6±4.7	64.8±7.5Δ	37.2±10.6*
Septal E/E'	7.6±1.9	10.6±3.3#§	13.5±4.7*
Mean ε-circ, %	28.0±5.1	27.7±4.9Δ	11.5±4.4*
Mean ε-radial, %	34.9±9.9	26.2±8.3Δ*	11.8±6.2*
Mean torsion, %	12.9±5.5	13.4±7.3Δ	5.6±4.4*

* $p<0.001$, § $p<0.05$ vs Control; Δ $p<0.001$, # $p<0.05$ vs SHF.

62.

A Novel Method for Automatic Myocardium Texture Analysis Based on Speckle Tracking
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Purpose: Abnormal myocardial acoustic properties have been evaluated and quantified by ultrasound texture alterations. Traditional analysis approach used manual way to position the define region of interest frame by frame to state the information on myocardium viabilities, however the amount of work was relative large and yielded to subjective. This study sought to develop an automatic method for myocardium texture analysis.

Method: Ten healthy volunteers were submitted to conventional 2D echocardiography. Consecutive frames in the short axis view of the posterior wall were stored in avi Format. Imaging conditions such as gain, depth were kept constant in the whole procedure. Speckle tracking method was used to track the region of interest that was selected in the first frame and mean gray levels within region of interest were automatically extracted from three consecutive cardiac cycles. Time in processing was compared between this automatic analysis method and the traditional approach.

Result: Mean gray levels made recurrent change in cardiac cycle in which the amplitude of Mean gray levels in posterior wall was 24.6 ± 2.1 . Processing time of this automatic analysis method was 0.09 ± 0.02 Frame/sec which was much less than the tradition approach 2.85 ± 0.08 Frame/sec ($P<0.01$)

Conclusion: This novel automatic analysis method reduced the load in data processing and improved the objectivity on ultrasound texture analysis which provided an alternation method for further evaluation.

63.

Dedicated Training Program Significantly Improves the Reproducibility in Measurement of Systolic Dyssynchrony by Tissue Doppler Imaging

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Purpose: The assessment of systolic dyssynchrony by tissue Doppler imaging (TDI) requires good skills in online image acquisition and offline analysis where learning curve exists. Attempts by inexperienced personnel may result in wrong results and thereby wrong decisions in referring patients for cardiac resynchronization therapy (CRT) or predicting treatment response. This study aimed to testify the mandatory need of a dedicated training program to ensure the reproducibility of dyssynchrony analysis.

Methods: Color TDI images of the 3 apical views from 70 patients were prepared, in which the standard deviation of the time to peak systolic velocity among the 12 segments (Ts-SD) was interpreted first by an expert. The level of difficulty in reading was labeled as 1 (easiest, 20 patients), 2 (30 patients) and 3 (most difficult, 20 patients). The images were then analyzed by 2 echo-cardiologists who only had a 1-hour lecture and demonstration on the methodology and practical tips (Beginners 1 & 2), as well as another 2 echo-cardiologists who received a structured training program in the form of 2-day workshop that enhanced both online image acquisition and offline analysis, including several hands-on and self-testing sessions (Graduate 1 & 2). Subsequently, the data were compared by liner correlation, Bland-Altman and reproducibility test.

Results: As shown in the Table, when compared with the standard measures of the expert, the analyses of both Beginners were unsatisfactory. The measurement with a difference of ≥ 10 ms counted 24% and 22% for Beginner 1 and 2, respectively. On the contrary, the assessments by both Graduate 1 and 2 were significantly improved (Table), while the measurement with a difference of ≥ 10 ms was only 1.5% and 3%.

Conclusion: Good reproducibility in measurement of systolic dyssynchrony by TDI can be achieved by the use of dedicated training program, which includes a comprehensive hands-on practice.

Table. Comparisons with the measures by expert

Statistical methods	Beginner 1	Beginner 2	Graduate 1	Graduate 2
Liner correlation, r value	0.643	0.567	0.935	0.929
Variability, %	18±21	19±23	8±7	7±7
Bland-Altman				
Mean difference, ms	3.45	0.92	0.97	-0.63
95% upper limit, ms	24.86	28.96	9.43	7.85
95% lower limit, ms	-17.96	-27.11	-7.49	-9.12

ABSTRACTS

Abstracts for Free Paper Session:

ANIMAL STUDIES AND MISCELLANEOUS

64.

Initial Experience with Self-monitoring & Self-management Oral Anticoagulation

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Purpose: Self-monitoring or self-management of oral anticoagulation can lead to reduction in thromboembolism, major haemorrhage, total mortality and total healthcare costs. We analyze the initial experience with the use of a portable coagulometer for self-monitoring and self-management of oral anticoagulation treatment in local setting.

Method: All patients with good comprehensive ability or good family support, willing to actively participate in treatment, sufficient manual dexterity and visual acuity being followed up in cardiac anticoagulant clinic were invited for self-monitoring and self-management. All patients who passed a formalized test were recruited for self-monitoring and self-management with the use of a portable coagulometer. The portable coagulometer (CoaguChek XS, Roche) in-use is an easy, fully automated coagulation monitor, which allows the determination of the prothrombin time, expressed as INR, from one drop of capillary whole blood from fingerstick. At intervals of routine INR monitoring, venous whole blood samples were applied to the test strip (test to be performed by patients) and citrated tube for laboratory comparison. Results were compared for assessing the reliability of the portable coagulometer. A log book to record their INR with warfarin dosing scheme (for those who opt for self-management) was distributed to every patient. Their INR 'percentage of time-in-range' during self-monitoring and self-management were assessed. Their treatment-related quality of life score were also analyzed.

Results: From September 2007 to January 2009, there were ten patients participated in self-monitoring & self-management program. Two of them went abroad and one was transferred to other hospital for follow up, leaving seven patients for analysis (5 opted for self-management after a period of self-monitoring and 2 for self-monitoring). Male to female ratio was 4 to 3. They were aged 45 +/- 14 (range 23 - 67) years. Three of them had mechanical valve replacement (2 with MVR, 1 with MVR & AVR). Three of them had mitral stenosis with atrial fibrillation. One patient had recurrent sagittal sinus thrombosis and non-ST elevation myocardial infarction. There were 40 blood samples included for the comparison. Linear regression analysis revealed portable coagulometer INR result = -0.25 + 1.05 x laboratory INR result with $r^2 = 0.94$. The frequency of self-monitoring INR was once in 14.6 days. All patients were able to measure the INR at home (and devise a dosing scheme in self-management group accordingly). The INR 'percentage of time-in-range' during self-monitoring period and self-management period were 52% and 63% respectively. The portable coagulometer detected one episode of markedly below range INR (<1.5) and three episodes of markedly above range INR (>3.5). There were 2 episodes of minor bleeding. The number of call for assistance was 0.2/patient/3 months. Their treatment-related quality of life score (maximal score is 6) depicted that they were satisfied with treatment (5.3 +/- 0.5), self-efficient (5.7 +/- 0.5), able to maintain social network (4.8 +/- 1.9), not hassled (1 +/- 0) and not distressed (1 +/- 0).

Conclusion: Our preliminary experience showed that self-monitoring and self-management of oral anticoagulation was feasible and well accepted by the participating patients.

65.

Clinical features and risk factors of acute pulmonary embolism – our local experience

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Purpose: Acute pulmonary embolism is a relatively common medical condition. Early diagnosis and risk stratification is the most challenging part in the management of patient with this fatal illness. This study is to examine the clinical characteristics and risk factors in patients with pulmonary embolism.

Method: Retrospective review of 69 patients admitted to our hospital for acute pulmonary embolism in year 2007 and 2008.

Results: In the 69 patients, there was a female predominant (26 male vs. 43 female) with age 65 +/- 18 (range from 26 to 93). The most common presenting symptom was dyspnea (63.8%), followed by chest pain (18.8%) and cough (13.0%). 2.9% of patients had previous history of pulmonary embolism. The most predisposing risk factor was active malignancy (39.1%) while 13 patients (18.8%) had no risk factors identified. 23 patients (33.3%) experienced prolonged bed rest/travel before presentation. 13 patients were bedridden, while 10 patients presented within 4 weeks after lower limb fracture, orthopedics or major surgery. Only 1 patient presented immediately after delivery and another 1 patient suffered from anti-phospholipids syndrome. Deep vein thrombosis was found in 42 patients (60.8%). RBBB or S₁Q₃T₃ was recognized in the ECG of 27 patients. 11 patients presented with hypotension. Echocardiographic evidence of RV dysfunction was demonstrated in 25 out of 62 patients. Troponin I level was elevated in 26 patients. 3 patients received thrombolytic therapy while embolectomy was performed in 7 cases, none of these patients died within 30 days of presentation. 8 patients died within 30 days.

Conclusion: Clinical presentation of acute pulmonary embolism is non-specific. The diagnosis requires high index of suspicion with early imaging. In those presented with high-risk features, prompt diagnosis with therapy can improve the clinical outcome of this fatal illness.

66.

Interrelations between the brachial artery endothelial function and the common carotid arterial hemodynamic and structural parameters in patients with systemic lupus erythematosus investigated by high resolution ultrasonography

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Objectives To analyze the correlation between the brachial artery endothelial function and the common carotid arterial hemodynamic and structural parameters in patients with systemic lupus erythematosus.

Methods Twenty-seven patients with SLE and twenty healthy subjects were studied. The intima media thickness of common carotid artery (IMT), pressure strain elastic modulus (Ep), pressure independent stiffness index (β) and shear rate (SR) were measured. Measurements of brachial artery diameter were performed by high resolution ultrasonography during baseline, reactive hyperemia and sublingual nitroglycerin administration. Percent changes in brachial artery diameter induced by reactive hyperemia and induced by nitroglycerin were calculated. The correlation between the brachial artery endothelial function and the common carotid arterial hemodynamic and structural parameters in patients with systemic lupus erythematosus was analyzed.

Results The percent change in the brachial artery diameter induced by reactive hyperemia in patients of SLE group was significantly less than that in healthy subjects ($P < 0.05$). When compared with the control group, the IMT of common carotid artery was thicker, the Ep and β increased, while the SR was lower ($P < 0.05$) in patients with SLE. The brachial artery endothelial function was correlated inversely with IMT ($r = -0.418$, $P < 0.05$) and the Ep ($r = -0.44$, $P < 0.05$) of common carotid artery. There was positive correlation between the brachial artery endothelial function and the SR ($r = 0.396$, $P < 0.05$) of common carotid artery in SLE.

Conclusions The common carotid arterial hemodynamic and structural parameters are related with

67.

Vasculitis and Pulse Wave Velocity in Rheumatoid Arthritis

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Purpose: The aim of this study was to investigate the relationship between pulse wave velocity (PWV) in patients with rheumatoid arthritis (RA) and the related index of inflammation.

Methods: Brachial-ankle pulse wave velocity (baPWV) was auto measured in 107 patients with RA and in 107 healthy individuals. Disease activity score (DAS) was determined. In this study, by immunohistochemical detection of patients with a number of indicators such as c-reactive protein (CRP), anti-endothelial cell antibody (AECA), anti-neutrophil cytoplasmic antibody (ANCA). Multiple regression analysis was performed for the RA patients to determine the independent predictors of PWV.

Results: In subjects with RA, the baPWV was significantly elevated compared with that in controls (14.97 [9.63] to [30.00] versus 12.64 [9.61] to [16.00] m/s, respectively; $P < 0.0001$). In multiple regression analyses, baPWV correlated independently with age, heart rate, mean arterial pressure, P-anti-neutrophil cytoplasmic antibody (P-ANCA) ($R^2 = 0.7157$, $P < 0.0001$).

Conclusions: baPWV in RA patients were significant increase and it is associated with angiopathy which caused by inflammation. PWV may well become an index of identifying vascular inflammatory process in RA.

ABSTRACTS

Abstracts for Free Paper Session:

68.

5-azacytidine activates three types of K⁺ currents during MSCs proliferation and differentiation

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Objective: To study the changes of the transient outward K⁺ current (I_{to}), delayed rectifier K⁺ current (I_{KDR}) and the inward rectifier K⁺ current (I_{K1}) of the rat bone mesenchymal stem cells (MSCs) induced by 5-azacytidine (5-Aza) during proliferation and differentiation *in vitro*.

Methods: MSCs were cultured for 2 weeks; K⁺ current was induced by 5-Aza in some cells. Uninduced cells were cultured for 6 wks. Induced cells were treated for 1, 2, 3 and 4 wks. Each week twenty cells were randomly tested by the whole-cell patch clamp technology and the K⁺ currents were identified by corresponding ionic blockers.

Results: No significant differences in K⁺ current intensities among samples were detected during the entire culture period. I_{to}, I_{KDR} and I_{K1} intensity were gradually increased after being induced for 1, 2, 3 and 4 wks. The increased K⁺ current intensities in the induced groups had no significant difference at 1 wk compared with uninduced cells. However, the K⁺ current intensities in the induced groups were increased significantly starting at 2 wks ($p < 0.05$) and reached 3-8 folds increase at 4 wks ($p < 0.01$). The results are summarized in the table below (Test voltage: I_{to} and I_{KDR} at +50mV, I_{K1} at -120mV).

Current Detection	Uninduced Group	1 Wk	Induced Groups 2 Wks	3 Wks	4 Wks
I _{KDR} (pA/pF)	3.39±1.05	5.68±2.80*	8.03±3.07**	13.00±2.70*	21.45±6.46**
I _{to} (pA/pF)	2.98±0.43	4.06±0.91*	9.21±2.03**	11.99±3.67*	24.98±5.13**
I _{K1} (pA/pF)	3.87±1.60	3.71±1.23*	5.75±2.51**	7.62±4.59*	11.18±4.54**

* $p < 0.05$ vs. uninduced group; ** $p < 0.01$ vs. uninduced group; # $p < 0.05$ vs. different time point

Conclusion: 5-Aza induction activates three types of K⁺ currents (I_{to}, I_{KDR} and I_{K1}) during MSCs proliferation and differentiation in early stage.

69.

Effect of hydrogen sulfide on the apoptosis of pulmonary artery smooth muscle cell in rats with pulmonary hypertension induced by high pulmonary blood flow

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Purpose: Hydrogen sulfide acts as a novel gasotransmitter in cardiovascular system and has recently been reported to prevent the pulmonary vascular structure remodeling induced by high pulmonary blood flow. The aim of the present study was to investigate whether induction of apoptosis of pulmonary artery smooth muscle cells (PASMCS) was involved in the mechanism responsible for the protective role of H₂S in the development of pulmonary hypertension induced by high pulmonary blood flow.

Methods: In the present study, we used a rat model of high pulmonary blood flow induced pulmonary hypertension established by an abdominal aorta-inferior vena cava shunt operation. DL-Propargylglycine (PPG), an inhibitor of endogenous H₂S production, was administrated intraperitoneally at a dose of 37.5mg/kg per day for 4 week since the shunting operation. On the other side, sodium hydrosulfide (NaHS), a H₂S donor, was administrated intraperitoneally at a dose of 56 μmol/kg per day for 11 weeks since the shunting operation.

Results: After 4 week shunting operation, the apoptosis of PVSMSCs, expression of Fas and Caspase-3 were significantly decreased ($P < 0.01$), but expression of Bcl-2 significantly increased ($P < 0.01$). PPG administration further promoted the apoptosis of PASMCS, downregulated the expression of Fas and caspase-3 ($P < 0.01$), and increased the expression of Bcl-2 ($P < 0.01$); After 11 weeks shunting operation, the apoptosis of PVSMSCs, expression of Fas and Caspase-3 were significantly decreased ($P < 0.01$), but expression of Bcl-2 significantly increased ($P < 0.01$). NaHS administration significantly increased the apoptosis of PASMCS, upregulated the expression of Fas and caspase-3, and inhibited the expression of Bcl-2.

Conclusion: H₂S might exert a protective role in the development of pulmonary hypertension induced by high pulmonary blood flow by inducing the apoptosis of PASMCS.

70.

Atorvastatin attenuates coxsackievirus B3-induced viral myocarditis in mice

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Purpose: The goal of this study was to investigate the therapeutic benefits of atorvastatin on Coxsackie virus B3-induced myocarditis in mice.

Methods: Mice were administered Eagle's minimal essential medium (18 mice), virus solution (intraperitoneally, 3×10^4 PFU/mL, 60 mice), atorvastatin (10mg/kg/day, 15 mice) or virus plus atorvastatin (10mg/kg/day, 50 mice). Atorvastatin was given 3 days after viral challenge and treatment lasted for 14 days in the atorvastatin and virus plus atorvastatin groups. Echocardiograms were examined on days 3, 7, 10, 14, 21, and 30 after virus inoculation (same days for the atorvastatin only group). Blood samples were collected for cardiac troponin I detection at the same time. Myocardial inflammation, cell apoptosis and Fas expression were detected by histology and immunohistochemistry.

Result: H&E staining and transmission electron microscopy revealed significant improvement of quantitative pathological features in the atorvastatin-treated CVB3-infected group. Immunohistochemical microscopy also showed a marked decrease in the level of cardiac cell apoptosis in the atorvastatin-treated group compared to infected animals that did not receive treatment. The differences in cTnI values between the virus-challenged animals and atorvastatin-treated virus-challenged mice achieve statistical significance, there was a trend toward a decrease in cTnI in the atorvastatin-treated mice. RT-PCR and western blotting revealed that the virus induced marked increases in Fas mRNA and protein expression, which could be prevented by treatment with atorvastatin.

Conclusion: These results demonstrate that atorvastatin reduces the histological and functional severity of CVB3-induced myocarditis, and inhibits apoptosis and Fas expression in the myocardium of CVB3-infected mice. The therapeutic benefits of atorvastatin on myocarditis may be explained, at least in part, by inhibition of Fas expression and inhibition of cell apoptosis.

71.

The experimental research of biologic effect on myocardium and ventricular function after treatment on rabbit myocardium by ultrasound wave activating hematoporphyrin

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Objective: To observe the impact of focused ultrasound activating hematoporphyrin on biologic effect and hemodynamics, and investigate the expression of apoptotic genes Bax and Bcl-2 with sonodynamic therapy for myocardial ablation.

Methods: All 24 Newland rabbits randomly divided into four groups: sham group (Sham, n=6), hematoporphyrin group (Hp, n=6), ultrasound group (U, n=6) and ultrasound + hematoporphyrin group (SDT, n=6). The thoracotomy was performed in all groups. In SDT groups, a dose of hematoporphyrin (2.5mg/kg) was injected by intravenous delivery. Two hours later, an ultrasound exposure on left ventricular myocardium was operated for 1 minute. In Hp group, the operation procedures were similar with the SDT group except for the injection of hematoporphyrin. The ultrasound exposure was performed in U group without administration of hematoporphyrin. However, all animals in Sham group didn't give hematoporphyrin and ultrasound treatment. After 4 d, the hemodynamics parameters were recorded by multichannel physiograph, then all animals were sacrificed and hearts were harvested. The necrosis was calculated by 2,3,5-Triphenyltetrazolium chloride (TTC) staining. The immunohistochemical SABC technique and TUNEL method were used to further study Bax, Bcl-2 express and cell apoptosis. The optical density value of Bax and Bcl-2 was analysed by image-pro software.

Results: As for hemodynamics, there were no statistical difference in all groups ($p > 0.05$). In gross view, the hemorrhage wasn't seen in Hp and Sham group, and the myocardial tissue was stained red by TTC. The necrosis and hemorrhage were found in U and SDT group respectively. After staining by TTC, there were some pots and white zone in exposure to ultrasound in U and SDT groups. Histological examination showed signs of myocardial cell injury in U group, with cytoplasmic vacuoles of various sizes, leakage of erythrocytes and infiltration of inflammatory cells in ultrasound exposure zone. The exposed tissue resembled complete coagulated necrosis in SDT group, with disappearance of cell structure, leakage of a few erythrocytes and infiltration of inflammatory cells. TUNEL analysis: There were no apoptotic cells observed in Hp and Sham groups. The apoptotic cells (94.4 ± 6.06) VS (167.8 ± 8.49) in ultrasound-exposure groups was significant greater than that of Sham and Hp groups. Bax and Bcl-2 express analysis: the optical density value of Bax in ultrasound exposure groups was obviously higher than that of Hp group (0.2560 ± 0.0034), (0.1950 ± 0.0029) VS (0.1240 ± 0.0021), but was lower than that of Bcl-2 (0.1140 ± 0.0031), (0.0850 ± 0.0024) vs (0.0680 ± 0.0035). There were significant statistic difference compared with Hp group.

Conclusions: The suitable SDT causes apoptosis and necrosis of myocardiocytes which apoptosis was related to up-regulation of Bax and down-regulation of Bcl-2, and not affect ventricular function, that maybe a new choice for myocardium ablation.

ABSTRACTS

Abstracts for Free Paper Session:

72.

Suberoylanilide hydroxamic acid, a histone deacetylase inhibitor, promotes cardiomyocyte differentiation of rat mesenchymal stem cells
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Purpose: The aim of this study was to investigate the effect of suberoylanilide hydroxamic acid (vorinostat, SAHA), a histone deacetylase inhibitor, on cardiomyocyte differentiation of mesenchymal stem cells (MSCs).

Methods: Rat bone marrow MSCs were treated with SAHA alone or in combination with 5-azacytidine (5-aza) for 7 days or 4 weeks. mRNA levels of early transcription factors related to cardiomyocyte --GATA-4、NKx2.5、MEF2c were detected by real-time quantitative RT-PCR. Protein expression of cardiac troponin T (cTNT) and myosin heavy chain (MHC) was detected by immunofluorescence staining and Western-blotting.

Results: Following 7 day treatment with SAHA, GATA4,NKx2.5 and MEF2c mRNA levels were significantly increased compared to control group or 5-aza-treated group ($p<0.05$). These mRNA levels were up-regulated in a trend of SAHA concentration gradient lower than 1 μ M, while they were down-regulated with 2 μ M SAHA. But a combination of SAHA and 5-aza did not further increase mRNA expression of these genes as compared to SAHA treatment alone. After 4 week induction by SAHA, cTNT protein was detectable in both SAHA and 5-aza groups by immunofluorescence staining. A significant increase of cTNT protein was observed in SAHA groups over MSCs group or 5-aza group using Western-blotting. However, treatment with both SAHA and 5-aza did not further increase the expression of cTNT protein compared to SAHA treatment alone. MHC protein was unmeasurable by either immunofluorescence staining or Western-blotting in all groups.

Conclusion: MSCs are able to undergo mesenchymal-to-cardiomyocyte transition. SAHA is essential to promote the differentiation of MSCs into cardiomyocyte-like cells. But the synergy between SAHA and 5-aza might not exist in the differentiation.

73.

Construction and expression of specific siRNA plasmid vector of p300

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Objective To construct and screen effective siRNA plasmid vector which can suppress the expression of p300 in mouse and establish the foundation for the further study of the temporal and spatial regulation of embryonic cardiac development by p300 and the impact on cardiac development mediated by imbalance of p300.

Methods Three recombinant plasmids vectors including DNA encoding short interference RNA, which matched the base pair of mouse p300 perfectly, were constructed and transfected into mouse embryonic stem cells. The expressions of p300 in different groups were detected by RT-PCR and immunofluorescence.

Results There were digestion sites of *Not* I and *Eco*R I in pSOS-HUS plasmid, but the *Not* I site was lost after recombinant. So after dual-enzyme digestion, the recombinant plasmids, p300siRNA1, p300siRNA2 and p300siRNA3 were digested into two fragments (1325bp and 3620bp) while pSOS-HUS was digested into only one long fragment (4920bp). The three recombinant plasmids p300siRNA1, p300siRNA2 and p300siRNA3 were confirmed again by DNA sequencing. 24h after cell transfection, the mRNA and protein levels of p300 in the cells transfected with p300siRNA1 or p300siRNA3 was depressed obviously than those in blank control cells ($P<0.05$), while there was no obvious changes in the cells transfected with pSOS-HUS or p300 RNAi 2 ($P>0.05$).

Conclusion The recombinant plasmids were successfully constructed, both p300siRNA1 and p300siRNA3 can block the expression of p300 effectively, which establishes the foundation for the further study on the role of p300 during the epigenetic heart development.

ABSTRACTS

Abstracts for Free Paper Session:

PAEDIATRIC CARDIOLOGY I

74.

Midodrine hydrochloride vs metoprolol therapies in postural orthostatic tachycardia syndrome of children

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Purpose: The study was designed to examine the effect of selective alpha 1 receptor agonist midodrine hydrochloride vs beta-adrenergic blockade metoprolol in the treatment of children with postural orthostatic tachycardia syndrome.

Methods: Fifty nine children (23 male, 36 female, age 7-18 yrs, mean age 12.3±2.4 yrs) who came from Peking University First Hospital were included in the study and clinical investigations. They were randomly divided into group I (with midodrine hydrochloride and conventional therapy), group II (with metoprolol and conventional therapy) and group III (with conventional therapy only). Standing test was conducted. At the end of follow-up, the cure rate, improvement rate and effective rate of symptoms were compared among the three groups. A Kaplan-Meier survivorship curve and LOG-RANK test were used to describe the follow-up proportion of symptom-free cases each month.

Results: The cure rate at the end of follow-up in group I was significantly higher than that of group II and group III (60.87% vs 30.00% and 25.00%, $P<0.05$). The effective rate at the end of follow-up in group I was also significantly higher than that of group II and group III (82.61% vs 50.00% and 43.75%, $P<0.05$). During follow-up, we discovered that the symptom recurrent rate in group I was significantly lower than group II and group III, respectively ($P<0.05$), but it did not differ significantly between group II and group III ($P>0.05$). And the time of symptom improvement in group I was shorter than group II and III.

Conclusion: Alpha 1 receptor agonist midodrine hydrochloride was more effective than beta-adrenergic blockade metoprolol in the treatment of children with postural orthostatic tachycardia syndrome.

75.

Dihydrofolate reductase gene plays central roles in zebrafish heart and out flow tract developments

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Purpose: In this study, we aimed to observe the abnormal phenotypes of heart and out flow tract which induced by *DHFR* knock-down, to detect the effects of *DHFR* on expression of genes which are essential for *Hedgehog* pathway or important to cardiac development including *NKX2.5*, *MEF2C*, *TBX20* and *TBX1*. The effects of *DHFR* on endoreplication and apoptosis also be examined.

Methods: Morpholino oligonucleotides or *DHFR-GFP* mRNA were microinjected to knock-down or over-expression *DHFR*. Microangiography was used to detect the development of out flow tract. Whole-mount in situ hybridization and real-time PCR were performed to detect the expression of genes. The endoreplication was detected by immunohistochemistry with phospho-histone H3 antibody staining and the apoptosis was examined by TUNEL staining.

Results: Obviously cardiac malformations and abnormal developments of out flow tract were observed in *DHFR* knock-down embryos. *DHFR* had positive effects on expression of *NKX2.5*, *MEF2C*, *TBX20* and *TBX1*. *DHFR* was required for *Hedgehog* pathway. *DHFR* also can promote the endoreplication and inhibit the apoptosis.

Conclusions: Our study suggested that *DHFR* plays crucial roles in developments of heart and out flow tract in zebrafish by regulating the transcriptions of genes and effecting endoreplication and apoptosis.

76.

Change of Electrocardiogram and Treatment in the Children with Congenital Ventricular Septal Defect by Interventional Processes

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Purpose To analysis the change of electrocardiogram (EKG) in the children with congenital ventricular septal defect (VSD) by interventional processes and to explore how to decrease the incidence of serious arrhythmias after the interventional catheterization.

Methods 260 patients underwent transcatheter VSD closure using Amplatzer membranous septa occluder. They were divided into arrhythmia group and no arrhythmia group (control group) after the interventional catheterization. The patients were treated with nutrition of cardiac muscle and medicines of reducing the cardiac muscle dropsy when they suffered from complete or serious atrioventricular block (AVB), and even underwent the temporary pacemaker quickly.

Results There were 178 cases in control group. Eighty-two cases (31.5%) had arrhythmias after the interventional catheterization, in which 4 cases (1.5%) were complete / serious AVB. Thirty-six cases (13.8%) were given medicine above. The age was smaller and the body weight was less in the arrhythmia group than that of control group ($p<0.05$). The device Occluder was bigger in the arrhythmia group than that of control group ($p<0.05$). There were significant differences in the comparison of the heart rate, QRS interval, PR interval, QT interval and QTc before and after occlusion in all the cases ($p<0.05$).

Conclusion The changes of EKG have to be take attention when underwent transcatheter VSD closure using occluder. It is important to avoid the oversized devices. When complete right branch bundle block (CRBBB), complete left branch bundle block (CLBBB) and II° AVB occur repeatedly in the procedure or after that, medicines should be given as early as possible, and once complete / serious AVB has emerged, it is much helpful to perform the temporary pacemaker. All of the cases with arrhythmia should be long-term followed-up.

77.

Transcatheter occlusion of arterial ducts with a new Amplatzer Duct Occluder : initial experience in Hong Kong

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Background: Despite the advances in transcatheter intervention, device closure of certain anatomic types of patent ductus arteriosus (PDA) in small children remains to be a challenge. The new Amplatzer Duct Occluder II (ADO II) is made of a multi-layered nitinol wire mesh shaped into a cylindrical waist with two retention discs. Its fabric-free design allows for low-profile devices and delivery system to handle all types of PDA in young children.

Objective: To examine the technical features of the ADO II for PDA occlusion in young children and report the short-term results and complications.

Method: From April 2008 to May 2009, thirteen patients underwent transcatheter closure of PDA using the ADO II. Two patients also had additional secundum atrial septal defect. Four had symptoms of heart failure. Two patients had chromosomal anomalies while two were ex-preemies. The median age was 21 months (range 1.83 months-6.3 years) and the median weight was 9.8 kg (range 3.96-21). The median PDA diameter was 2.9 mm (range 1.8- 4.7). The median PDA length was 4.6 mm (range 2.1-14). Five had type C (tubular) duct and 8 had type A duct. Serial echocardiography was performed at 1 day, 1 month, 3 months, 6 months and 1 year after implantation. The median length of follow-up was 4.6 months (range 0.2-13.9).

Results: All except one implantation were technically successful. The device was not deployed due to unsecured placement. Complete immediate angiographic closure was seen in 4 patients (33.3%). The closure rate at 1 day after implantation was 83.3%. One patient had a residual duct one year later. The median fluoroscopy time was 11.4 minutes (range 7.1 to 20) and the median procedure time was 80 minutes (range 59 to 121 minutes). Mild device-related left pulmonary artery obstruction was noted in one patient. One occluder embolized to left pulmonary artery one day after the procedure and was successfully retrieved. This patient was subsequently scheduled for surgical ligation of PDA. One patient died of unrelated cause 7 months after the procedure.

Conclusion: The ADO II showed an initial promising result for occlusion of PDA of various shapes, sizes and lengths in small children. Further studies are required to document its efficacy, safety and long-term results.

ABSTRACTS

Abstracts for Free Paper Session:

78.

The Diagnoses of Trachea and Bronchus stenoses by using 64-detector Row Computed Tomography in Children with Congenital Heart Disease

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Objective: To investigate the value of multidetector-row spiral computed tomography (MDCT) in diagnosing tracheobronchial stenosis in children with congenital heart disease.

Methods: Sixteen children with congenital heart disease and suspected tracheobronchial stenosis were examined by contrast enhanced MDCT. Conventional axial slices, multiplanar reconstruction (MPR) and 3-dimensional volume rendering (VR), virtual tracheobronchoscopy (VTB) were used. Interobserver agreement for the diameters and areas of the narrow tracheobronchoscopy was evaluated with Bland-Altman analysis.

Results: CT showed that tracheal stenosis was observed in all of 16 patients resulted from vascular compression due to the double aortic arch (n=1), right aortic arch (n=2), pulmonary artery malposition (n=2), pulmonary artery dilatation (n=6), and left pulmonary artery sling (n=5). All straitness were correctly depicted by conventional axial slices, MPR, VR, and VTB. There was an excellent agreement in quantifying the diameters and areas of tracheobronchoscopy by two independent observers.

Conclusion: 64-MDCT with the use of reconstruction techniques is effective for the evaluation of tracheobronchial stenosis in children with congenital heart disease.

79.

Transcatheter closure of perimembranous ventricular septal defects: A comparative study between the asymmetric device and the symmetric device.

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Purpose: To compare the efficacy and complications of the asymmetric device for closure of perimembranous ventricular septal defects (PMVSD) with those of the symmetric device.

Methods: A retrospective study was performed for the patients with PMVSD in Guangdong cardiovascular institute from October 2002 to December 2007. The patients were assigned to either the asymmetric group or the symmetric group according to the style of the used device. Baseline clinical dates, efficacy and complications were compared preprocedure and at follow-up within 12 months.

Results: A total of 509 patients with PMVSD were enrolled in the study, including 266 patients in the group undergoing the asymmetric device and 243 patients in the group undergoing the symmetric device. There were no other differences about baseline clinical dates between two groups (all $p>0.05$) except that the distance from VSD to aortic right valve was shorter in the asymmetric group than in the symmetric group (3.5 ± 0.7 vs 5.2 ± 1.2 mm, $P=0.01$). The procedural success rate was 97.8% for the asymmetric group and 98.3% for the symmetric group ($p=0.98$). The rate of the VSD complete closure at once was 97.1% for the symmetric group and 87.0% for the asymmetric group ($p=0.001$), however, there was no difference on the VSD complete closure rate at 24h, 1, 3, 6 and 12 month after the occlusion (all $p>0.05$). The major complication rate was 3.8% for the asymmetric group and 1.7% for the symmetric group ($p=0.060$), but the minor complication rate was higher in the asymmetric group than that in the symmetric group (56.8% vs 42.8% , $p<0.001$). There was no death for both groups.

Conclusions: The efficacy and major complication rate were not statistically different between the asymmetric and the symmetric device within one year follow-up after occlusion, however, the rate of the arrhythmia out of the minor complications was lower for the symmetric device than for the asymmetric device.

80.

Analysis of Single Nucleotide Polymorphism of HIRA gene in patients with conotruncal anomalies

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Purpose: To investigate the relationship of single nucleotide polymorphisms (SNPs) of HIRA gene with conotruncal anomalies (CTA).

Methods: A cohort of 203 pediatric patients with CTA including TOF (87 cases), PA (55), TGA (32), and DORV (29). One hundred and fifty patients with simple congenital heart diseases (CHD) and 150 normal children were used as control. PCR and genotyping were performed for the detection of SNP at exon 5, exon12, exon 19, exon 22 and exon 25 of HIRA gene. The correlations of SNPs of HIRA gene and CTA were analyzed.

Results: (1) Frequency of genotype of A at position 100308 in exon 25 was 13.8% in TOF group, while it was 3.3% in the normal control ($\chi^2=7.779, P=0.005$, OR=5.264, 95%CI is 1.463-18.937). The allele frequencies of the less common A variant were 8.6% in TOF group and 1.7% in the normal control ($\chi^2=4.714, P=0.030$, OR=4.846, 95%CI is 1.020-23.084). (2) Both GG, GA and AA genotype frequencies and G/A allele frequencies at position 100598 in exon 25 had no difference between CTA, simple CHD and normal control groups. (3) Frequency of genotype of G at position 25983 in exon 5 was 15.3% in simple CHD, while it was 6.2% in TGA group ($\chi^2=4.310, P=0.038$, OR=2.765, 95%CI is 1.026-7.449), and 3.4% in DORV group ($\chi^2=8.791, P=0.003$, OR=5.706, 95%CI is 1.597-20.368). However, the allele frequencies of the less common G variant were no difference between these groups.

Conclusion: SNP at position 100308 G/A of HIRA gene is associated with the susceptibility of TOF. Allele A is susceptible allele to TOF. SNPs at both positions of 100598 G/A and 25983 C/G of HIRA gene are not associated with conotruncal anomalies.

ABSTRACTS

Abstracts for Free Paper Session:

PAEDIATRIC CARDIOLOGY II

81.

Transcatheter occlusion of residual ventricular septal shunts for complex congenital heart defects after previous surgery

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Purpose: Residual ventricular septal shunt was common for complex congenital heart defect (CHD) after previous radical or palliative surgery. Reoperation was usually chosen for closure of residual shunt. Recently, transcatheter occlusion has become the treatment of choice in selected patients with isolated ventricular septal defect (VSD) and has been proved as effective as the conventional gold standard therapy of surgical repair. However, we are not sure if transcatheter closure is effective for residual VSD after previous surgery in complex CHD. Here we reported 12 cases with residual shunts of VSD after surgery. All were successfully closed by transcatheter technique.

Methods: 12 patients with residual ventricular septal shunts were admitted in our hospital from July 2004 to Dec. 2008, who were diagnosed complex CHDs and received surgery at least once previously. After routine left and right heart catheterization and left ventriculography, appropriate ventricular septal occluders were selected and implanted. Follow-up was carried out.

Results: There were 10 boys and 2 girls. The original anomalies were tetralogy of Fallot (TOF) in 4, double outlet right ventricle (DORV) with VSD and pulmonary arterial hypertension (PAH) in 4, complete transposition of great arteries (TGA) with VSD and PAH in 2, complete atrio-ventricular canal (CAVC) with PAH in 1, and pulmonary atresia (PA) with VSD and major aorto-pulmonary collateral arteries (MAPCAs) in 1. The previous radical or palliative surgeries were performed 24 (1-133) months before catheter intervention. The median age at intervention was 10.1 (4.3-15.7) years old. The average diameter of residual shunt was 6.43±3.10 (2.65-11.74) mm. 12 interventions were performed to implant 13 occluders. One was Amplatzer eccentric perimembranous ventricular septal occluder, the other 12 were Heartr (domestic-made) concentric perimembranous ventricular septal occluders. The average diameter of occluder was 9.64±3.80 (5-16) mm. The technical successful rate was 100%. The median follow-up period was 26 (3-55) months. No cases were found to have new onset complete heart block. 4 patients still had residual shunts after intervention, but the diameters of shunts were significantly smaller than those before intervention (3.38±2.52 vs. 7.73±1.53 mm, p=0.02900). Localized aortic regurgitation persisted in 1 case after intervention. The others did not influence the aortic valve. No influence on tricuspid valve was found.

Conclusion: Transcatheter occlusion of residual ventricular septal shunt might be safe and effective for complex CHD after previous surgery. No trends to develop complete heart block were found. However, residual shunting might be still present in several patients after intervention. More cases were needed for further experience.

82.

A Clinical Study of T-wave Alternans in Pediatric Patients

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Objective: To investigate cause of T-wave alternans in pediatric patients, and prevent malignant ventricular arrhythmia and sudden cardiac death.

Methods: Retrospective analysis of the treating process of 6 pediatric patients with T-wave alternans. Case 1 was a child with acute serious myocarditis; Case 2 was a child with idiopathic left ventricular tachycardia, had acquired long-QT Syndrome after treated with large dose of amiodarone for a long time by unclear diagnosis; Case 3 had congenital long-QT Syndrome; Case 4 was a child with myocardial infarction after correction of coarctation of aorta for 5 months; Case 5 and 6 was a child who increasing heart rate for various reasons with Severe Congenital stenosis of aortic valve.

Result: All of 6 cases occurred T-wave alternans, and 5 cases of them occurred malignant ventricular arrhythmia instantly or after several hours. In 2 cases, T-wave alternans disappeared and malignant ventricular arrhythmia did not occurred through prevention and treatment; in the other 4 cases, patients were died without active prevention for malignant ventricular arrhythmia.

Conclusion: T-wave alternans is presymptom of malignant ventricular arrhythmia and sudden cardiac death, and should be treated seriously. Firstly, we should take notice of occurrence of malignant ventricular arrhythmia in pediatric patients with T-wave alternans, while diagnosing and treating correctly for primary disease; secondly, it is of great importance preventing occurrence of T-wave alternans.

83.

The First Paediatric Heart Transplant in Hong Kong

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Purpose: To report the first pediatric heart transplant in a 6-year-old girl in Hong Kong.

Case Report: A 6-year-old Chinese girl presented with poor appetite and decrease exercise tolerance in September 2008. Investigations revealed the diagnosis of dilated cardiomyopathy. Metabolic investigations showed no evidence of metabolic cardiomyopathy. Cardiac catheterization revealed poor left ventricular contraction (LVEF 14%) and elevated LVEDP to 20 mmHg. Coronary arteries were normal. Endomyocardial biopsy showed only non-specific pathological changes. She developed decompensated heart failure in November 2008 despite optimization of all the antifailure medications. She was inotrope-dependent and intermittent intravenous levosimendan was given. She was put on heart transplant list since November 2008. Heart transplant was performed in April 2008. The donor was a 7-year-old child diagnosed brain death after extensive intracerebral haemorrhage due to cerebral arteriovenous malformation. Immunosuppression induction consisted of intravenous Azathioprine, Methylprednisolone and Daclizumab. She had excellent haemodynamics after operation and was successfully extubated within 12 hours. Maintenance immunosuppression therapy consisted of oral cyclosporine, mycophenolate sodium Myfortic and prednisolone. Day 10 after operation, she complained of headache and then developed focal seizure and confusion. MRI brain showed features compatible with posterior

reversible encephalopathy syndrome due to cyclosporine neurotoxicity. She made complete neurological recovery two days later after stopping of cyclosporine A and control of systemic hypertension. She was discharged home 3 weeks after transplantation. Immunosuppression therapy consisted of Tacrolimus, Myfortic and prednisolone. Echocardiography showed good right and left ventricular function. White cell count, renal and liver biochemistry were normal. There was no abnormal neurological sign.

Conclusion: Heart transplantation is an option of treatment for end-staged heart failure in children. Early and intermediate survival after transplantation is good. Achievement of successful paediatric heart transplant is possible in Hong Kong. The main problem is the lack of pediatric donor.

ABSTRACTS

Abstracts for Free Paper Session:

84.

Radiofrequency Catheter Ablation of Arrhythmias in Pediatric Patients Guided by Three-dimensional Mapping System

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Objective: To discuss security, indication and advantage of mapping and ablation of arrhythmia in children guided by Carto and Ensight system.

Methods: Guided by Carto System, radiofrequency catheter ablation (RFCA) was performed on 8 pediatric patients with tachycardia mean age 6.2 ± 1.7 years, mean weight was 18.0 ± 2.0 kg. Guided by Ensight system, RFCA was performed on 10 pediatric patients with arrhythmia. 8 cases of them were ablated guided by Ensight Array system: 6 cases with premature ventricular contractions (PVCs), 2 cases with right atrial tachycardia, mean age 11.3 ± 1.2 years, mean weight 40.0 ± 5.0 kg. The other two cases with W-P-W syndrome were ablated guided by Ensight Navx system.

Result: Guided by Carto system, 8 cases were successfully mapped and ablated: 6 cases with incision atrial tachycardia, 1 case with left atrial tachycardia and 1 case with right atrial tachycardia. 1 case with incision atrial tachycardia recurred after 3 months, and was ablated again successfully. Guided by Ensight Array system, 6 cases with PVCs (2 originating from the right Ventricular inflow tract and 4 originating from the right Ventricular outflow tract) and 2 cases with right atrial tachycardia were successfully mapped and ablated, PVCs of the first 6 cases descend from $32333 \pm 4509/24$ h to $0-4/24$ h after ablation. 1 case with automatic atrial tachycardia could not be mapped by Ensight Array system, because P wave didn't be identified with T wave. Single bolus of adenosine 20mg was given in 30s to let ventricles stop for 2s (cardioventricular pacing standby) until T wave vanished, mapping and ablation were operated again successfully, but another atrial tachycardia occurred 1 day later. Guided by Ensight Navx system, 2 cases with W-P-W syndrome were successfully ablated, operation under X-rays last 8 and 10 min. All 9 patients did not recur after follow-up of 6 months.

Conclusion: Carto system is fit for mapping and ablation in pediatric patients with continuous tachycardia, especially with incision atrial tachycardia; Ensight Array system is fit for older than 10 years with right heart discontinuous arrhythmia; and Ensight Navx system can set up model and display endocardial anatomic structure quickly. Compare with two-dimensional mapping system, three-dimensional mapping system (Carto and Ensight) can display the origin of arrhythmia and activation sequence clearly, decrease difficulty of operation efficiently and diminish operation time under X-ray.

85.

Inhaled Iloprost in the Evaluation of Pulmonary Arterial Hypertension Associated with Congenital Heart Defects in Children

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Purpose: Heart catheterization and acute vasodilator testing is one of the most important methods in the evaluation of pulmonary arterial hypertension (PAH) associated with congenital heart defects (CHD). Iloprost is one of the analogs of prostacyclin that could be delivered through inhalation. It has been applied worldwide in patients of PAH with WHO functional class III to IV. We investigated the safety and efficacy of acute vasodilator testing using inhaled iloprost in PAH associated with CHD in children, in comparison with the traditional vasodilator phentolamine.

Methods: 50 patients of PAH associated with CHD were collected from the department of pediatric cardiology in Guangdong Cardiovascular Institute. Each patient received left and right heart catheterization followed by acute vasodilator testing using either direct injection of phentolamine into pulmonary artery or inhaled iloprost. After testing, right heart catheterization was repeated. Hemodynamic parameters were calculated according to Fick's principal. After evaluating the nature of PAH, patients were divided into two groups, the 'functional' PAH group and the 'occlusive' PAH group. The functional group received surgery. Diagnosis was corrected if we found the original 'functional' patient is actually 'occlusive' during follow-up.

Results: Phentolamine significantly increased the heart rate while inhaled iloprost only had slight effect. Both vasodilators lowered the mean pulmonary arterial pressure (mPAP) and pulmonary vascular resistance (PVR) and increased pulmonary blood flow (Qp). Phentolamine decreased the mean systemic arterial pressure (mSAP) and systemic vascular resistance (SVR) and increased systemic blood flow (Qs) as well while inhaled iloprost had no obvious effect on the systemic circulation. After inhaled iloprost, the decrease of mPAP and the ratio of pulmonary to systemic vascular resistances (Rp/Rs), as well as the increase of the ratio of pulmonary to systemic blood flow (Qp/Qs), were more significant in the 'functional' group than in the 'occlusive' group (P value 0.016, 0.024, 0.030 respectively). As for phentolamine injection, the decrease of mPAP and PVR were more significant in the 'functional' group than in the 'occlusive' group (P value 0.017 and 0.004 respectively).

Conclusion: Inhaled iloprost and pulmonary injection of phentolamine can both effectively differentiate the functional and occlusive PAH in CHD. Phentolamine influenced both pulmonary and systemic pressure, resistance, and blood flow while inhaled iloprost mainly had effect on the pulmonary circulation. Inhaled iloprost can help to maintain hemodynamic stability and precedes phentolamine.

ABSTRACTS

Abstracts for Free Paper Session:

86.

Flow-mediated vasodilation and endothelium function in children with postural orthostatic tachycardia syndrome: A controlled and follow-up study

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Purpose: To examine the flow-mediated vasodilation (FMD) by color Doppler vascular ultrasound was a noninvasive way to measure the function of endothelium. The aim of this study was to explore the FMD and endothelium function in children with postural orthostatic tachycardia syndrome (POTS).

Methods: The patients group was consisted of 46 children aged (12.13 ± 2.80) years diagnosed as POTS by head-up test or head-up tilt test from June 2008 to January 2009 in Peking university first hospital. Twenty healthy children aged (11.55 ± 3.65) years were selected as control group. FMD of brachial artery was measured using color Doppler vascular ultrasound for every participant and the comparison between the two groups was done by independent t test. The patients who received treatment of midodrine (α adrenergic-receptor agonist) were followed up and FMD was detected again after 1 months. Plasma concentration of nitric oxide (NO) and nitric-oxide synthase (NOS) were determined in both patients and control groups.

Results: There were no significant differences between POTS group and control group in age, sex ratio, height, body weight, baseline blood pressure, heart rate and baseline brachial artery diameter. Patients in POTS group had greater FMD ($10.80\% \pm 4.35\%$) than that of control group ($5.65\% \pm 2.19\%$), the difference was significant ($P < 0.01$). FMD of children with POTS became smaller after the treatment of midodrine ($P < 0.01$). POTS patients with better response to midodrine had greater baseline FMD than the non-responders. Both of plasma NO and NOS levels was significantly higher in POTS group than control group (NO: $73.74 \mu\text{mol/L} \pm 18.57 \mu\text{mol/L}$ in POTS vs $62.09 \mu\text{mol/L} \pm 6.20 \mu\text{mol/L}$ in control, $P < 0.01$; NOS: $20.59 \text{U/mL} \pm 3.50 \text{U/mL}$ in POTS vs $15.36 \text{U/mL} \pm 1.39 \text{U/mL}$ in control, $P < 0.01$).

Conclusion: Augmented flow-mediated vasodilation and abnormal function of endothelium may play an important role in children with POTS. And FMD may be considered as an indicator of efficacy during treatment for POTS.