

Journal of the Hong Kong College of **CARDIOLOGY**



Abstracts of
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Hong Kong College of Cardiology
4-6 May 2012
Hong Kong

Hong Kong College of Cardiology



Twentieth Annual Scientific Congress

May 4 – 6, 2012
Sheraton Hong Kong Hotel & Towers
Hong Kong

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Scientific Programme

Friday, 4 May 2012

0800	4/F	Registration	
0900 - 1030	Ching Room	Free Paper Session Percutaneous Coronary Intervention	
	Ming Room II	Free Paper Session Coronary Artery Disease and Heart Failure and Hypertension	
1030 - 1100	Terrace of Sung Room	Coffee Break & Visit Exhibits	
1100 - 1230	Ching Room	Free Paper Session Cardiac Surgery	
	Ming Room II	Free Paper Session EP and Arrhythmias and Valvular Heart Diseases + Miscellaneous	
1245 - 1315	Ballroom C	Plenary Lecture The Challenge and Strategies in CVD Control in China	Da-yi Hu
1315 - 1430	Terrace of Sung Room	Light Lunch	
1430 - 1530	Ballroom C	Best Paper Oral Presentation	
1530 - 1600	Terrace of Sung Room	Coffee Break & Visit Exhibits	
1600 - 1830	Ballroom C	Joint European Society of Cardiology / Hong Kong College of Cardiology / Macau Cardiology Association Symposium	
		Integrating Cardiovascular Imaging in Ischemic Heart Disease	Fausto Pinto
		Transcatheter Aortic Valve Implantation (TAVI) - The QEH Experience	Chung-seung Chiang
		Surgical Management of End-stage Heart Failure	Wing-kuk Au
		The Anti-platelet Strategies for High Risk CHD Patients Based on the Platelet Function Monitoring Test	Yi-da Tang
		Management of Symptomatic Pre-mature Ventricular Complexes	Yat-sun Chan
1845 - 1930	Ballroom C	Hong Kong Heart Foundation Lecture Cardiac Rehabilitation and Secondary Prevention of Ischemic Heart Diseases	Suet-ting Lau
1930 - 2100	Ballroom A & B	Welcome Dinner	

Saturday, 5 May 2012

0800	3/F	Registration	
0830 - 1230	Ballroom C	Joined Symposium - Cross-straits Medicine Exchange Association of Ministry of Health / Hong Kong College of Cardiology Guideline and Practice: Clinical Case Based Conference (GAP-CCBC) <i>(Presentation in English or Putonghua)</i>	
		Late Acquired Double Lumen in a Sirolimus-eluting Stent Recanalized Chronic Total Occlusion Lesion: Angiographic and Optical Coherence Tomographic Findings Peking Union Medical College Hospital 中國醫學科學院附屬北京協和醫院	Hong-zhi Xie 謝洪智
		The Post-PCI In-stent Thrombosis: The Cause and Strategy Analysis Shanghai Tenth People's Hospital 同濟大學附屬上海第十醫院	Ya-wei Xu 徐亞偉
		The Post-PCI Cardiac Tamponade in a Patient with Anterior Acute ST Elevation Myocardial Infarction Fujian Medical University Union Hospital 福建醫科大學附屬協和醫院	Liang-long Chen 陳良龍
		Percutaneous Coronary Intervention for Chronic Total Occlusions: My Strategy Cheng Hsin General Hospital 振興醫療財團法人振興醫院	Chien-ming Huang 黃建銘
		The delayed forearm abscess after PCI in a patient with Renal transplantation Beijing An-Zhen Hospital 首都醫科大學附屬安貞醫院	Zhen-qian Yin 陰貞茜
		Topic to be confirmed Shanghai Oriental Hospital 上海東方醫院	Yan Lai 來晏
		IVUS Complex Case Macau Government Hospital 澳門公立醫院	U-po Lam 林如波
		The Diagnosis and Treatment Strategy for an ACS Patient with Hyperthyroidism Guangdong General Hospital 廣東省心血管病研究所廣東省人民醫院	Ning Tan 譚寧
		A Case of Chest Pain - Does It Caused by CHD Beijing Tongren hospital 首都醫科大學附屬同仁醫院	Li-zhu Guo 郭麗珠
		A Trapped Balloon Queen Elizabeth Hospital 伊利沙伯醫院	Chi-yuen Wong 黃志遠
		A Young Patient with Hypertensive Heart Disease, Heart Failure and Diffuse Left Anterior Descending Artery Stenosis Second Affiliated Hospital of Zhejiang University College of Medicine 浙江醫科大學附屬第二醫院	Jun Jiang 蔣峻
		Is it the Pacemaker which Cause the Problem Guangdong Cardiovascular Institute 廣東省人民醫院廣東省心血管病研究所	Li-wen Li 黎勵文

0930 - 1030	Ballroom A & B	Allied Cardiovascular Health Professionals Symposium (Venue: Ballroom A&B) ABC of Catheterization Laboratory Tools Chairpersons: Andy Wai-kwong Chan Wai-kit Ching	
		Intravascular Ultrasound	William Hau
		Fractional Flow Reserve	William Chi-kin Chan
1100 - 1200	Ballroom A & B	Allied Cardiovascular Health Professionals Symposium (Venue: Ballroom A&B) ABC of Catheterization Laboratory Tools Chairpersons: Thomas Kwok-shing Wong Chee-wo Wu	
		Optical Coherence Tomography	Simon Cheung-chi Lam
		Rotablator	Tin-chu Law
1230 - 1400	18/F, Sky Lounge	Lunch	
1400 - 1430	Ballroom C	Opening Ceremony Guest-of-Honour: Dr. Che-hung Leong Executive Councilor & Former Chairman Hospital Authority	
1430 - 1530	Ballroom C	Medtronic Symposium - Simplify The Challenge 1. Safe and Simplified Solution for DM patient in Complex cases 2. Innovative Approach to Resistant Hypertension 3. Peripheral Intervention in Diabetic Patient	Alan Yeung Alan Yeung Bryan Yan
1530 - 1630	Ballroom C	AstraZeneca Symposium Acute Coronary Syndrome – From ESC Guideline to Daily Practice	Fausto Pinto
1630 - 1730	Ballroom C	Bristol-Myers Squibb Pharma Symposium Managing Cardiovascular Complications in Patients with Type 2 Diabetes	Romesh Khardori
1730 - 1830	Ballroom C	Abbott Vascular Symposium 1. Introduction to MitraClip Therapy: Which of My Patients are Optimal Candidates? 2. ABSORB - Clinical Update and Practical Application	Steve Sorenson Robert-Jan van Geuns
1845 - 1945	Ballroom C	Plenary Lectures Advancing Stroke Prevention in Atrial Fibrillation (SPAF) - The Emerging Role of Factor Xa Inhibition Bioabsorbable Polymer Drug-Eluting Stents	Reginald Liew Bo Xu
1945 - 2100	Ballroom A & B	Dinner	

**Coffee will be served from 1030 - 1100 and 1600 - 1630 at 4/F Sung Terrace*

Sunday, 6 May 2012

0800	3/F	Registration	
0900 - 1100	Ballroom C	Plenary Lectures	
		Anti-platelet Dilemma	Ze-ning Jin
		Dual Therapy Stent	Michael Haude
		Rde of Antiplatelet Therapy in Management of STEMI Patient - Local Experience	Frankie Tam
		Advanced Echocardiography Analysis for Diagnosis and Patient Management	Kelvin Kai-hang Yiu
1100 - 1130	Terrace of Sung Room	Coffee Break & Visit Exhibits	
1130 - 1330	Ballroom C	PCI Cases Discussion	
		Prize Presentation	
1330 - 1500	Ballroom A & B	Lunch	
1500 - 1600	Ballroom C	Plenary Lectures	
		Novel Anticoagulants: Current Issues and Practical Tips in Management of Atrial Fibrillation Patients	Jeffrey Wing-hong Fung
		Taking DES Technology from Concept to Clinical Proof - BA9TM Technology Overview	Ronald Chi-heng Li
1600 - 1630	Terrace of Sung Room	Coffee Break & Visit Exhibits	
1630 - 1730	Ming II Room	EPS Symposium	
		ECG in Sudden Cardiac Death	Ngai-shing Mok
		How to Avoid Implantable Lead Failure?	Ngai-yin Chan
1730 - 1830	Ming II Room	CT / MRI Symposium	
		Computed Tomography Heart of Tomorrow Track	Stephen Chi-wai Cheung
		When Cardiac Magnetic Resonance Complements Other Modalities: Case Review	Carmen Chan
1830 - 2000	Sung Room	Farewell Dinner	

Paediatric Cardiology Symposium

Saturday, 5 May 2012

0900 - 1030	Ching Room	Paediatric Cardiology Symposium I Chairpersons: Kai-tung Chau NB Ling	
		Hybrid Procedures in Congenital Heart Disease	Frank Ing
		Experimental Study of the Mechanical Properties and Biodegradation Rate of the New Iron Stent for the Treatment of Great Artery Stenosis	Kun Sun
		Postoperative Arrhythmia in Patients with CHD	Fen Li
1030 - 1100	Terrace of Sung Room	Coffee Break & Visit Exhibits	
1100 - 1200	Ching Room	Paediatric Cardiology Symposium I Chairpersons: Lok-yeo So SB Chen	
		Surgical Management of CHD in Neonates: Current Status in Mainland China	Bing Jia
		Anticoagulation Strategy after Fontan-type Procedures	Yiu-fai Cheung
		Transcatheter Closure of Perimembranous Ventricular Septal Defect (VSD)	Hui-shen Wang
1200 - 1245	Ching Room	Free Paper Session Paediatric Cardiology I	
1230 - 1400	18/F, Sky Lounge	Lunch	
1400 - 1430	Ballroom C	Opening Ceremony	
1430 - 1600	Ching Room	Paediatric Cardiology Symposium II Chairpersons: Tak-cheung Yung YF Li	
		Interventions in Neonates and Infants with Congenital Heart Disease	Frank Ing
		Transcatheter Device Closure of Perimembranous Ventricular Septal Defect: Fudan Experience	Fang Liu
		Diastolic Heart Failure with Preserved Ejection Fraction in Pediatric Patients	Kin-sing Lun
1600 - 1630	Terrace of Sung Room	Coffee Break & Visit Exhibits	
1630 - 1740	Ching Room	Free Paper Session Paediatric Cardiology II	

ABSTRACTS

Abstracts for Free Paper Session:

CORONARY ARTERY DISEASE

1.

Association between polymorphism of methylenetetrahydrofolate reductase (MTHFR) C677T and risk of myocardial infarction: a meta-analysis for 8,140 cases and 10,522 controls

Chao Xuan¹, Xiao-Yan Bai¹, Ge Gao¹, Qin Yang^{1,2}, Guo-Wei He^{1,3}
¹TEDA International Cardiovascular Hospital, Medical College, Nankai University, Tianjin, PR China

²The Chinese University of Hong Kong, Hong Kong, PR China
³Department of Surgery, Oregon Health and Science University, Portland, Oregon, U.S.A

Purpose: The methylenetetrahydrofolate reductase (MTHFR) gene C677T polymorphism has been reported to be associated with myocardial infarction (MI), but the results from previous studies were conflicting. The present study aimed at investigating the association between this polymorphism and risk of MI using a meta-analysis on the published studies.

Methods: The Medline, EBSCO, BIOSIS, and Cochrane Library were searched to identify eligible studies published in English before August, 2011. Data were extracted using standardized methods. The association was assessed by odds ratio (OR) with 95% confidence intervals (CI). Begg's test was used to measure publication bias.

Results: A total of 30 case-control studies, containing 8,140 MI cases and 10,522 controls were involved in this meta-analysis. Overall, significant association was found between MTHFR C677T polymorphism and risk of MI when all studies pooled with fixed-effects model for TT vs. CT (OR = 1.183, 95% CI: 1.076 – 1.300). In the subgroup analysis, the same association was found in overall Caucasians (OR = 1.139, 95% CI: 1.007 – 1.288) and young/middle-aged (< 50 years) Caucasians (OR = 1.275, 95% CI: 1.077 – 1.509). No associations were detected between MTHFR C677T and the risk of MI in old-aged, male, female Caucasians, East Asians, South Asians, and African-Americans.

Conclusions: The meta-analysis results suggest that the MTHFR C677T polymorphism was associated with risk of MI in young/middle-aged Caucasians. The effect of the variants on the expression levels and the possible functional role of the variants in MI should be addressed in further studies.

2.

The Relationship between Waist Circumference and Glycated Hemoglobin in the United States

N. R. Samaranyake¹, C. Li¹, K.L. Ong^{2,3}, B. M. Y. Cheung¹
¹Department of Medicine, University of Hong Kong, Hong Kong
²Lipid Research Group, Heart Research Institute, Sydney, NSW, Australia
³Department of Medicine, University of Sydney, NSW, Australia

Purpose: Obesity leads to type 2 diabetes, an important risk factor for cardiovascular disease. As glycated hemoglobin (A1C) can now be used for the diagnosis of diabetes, we studied the relationship between A1C and waist circumference.

Methods: 1806 men and 1734 women over the age of 20 years in the United States National Health and Nutrition Examination Survey 2005-2008 who had fasted overnight and were not on medication for diabetes were included for analysis. A1C levels of 5.7% and 6.5% were used as cut-offs for pre-diabetes and diabetes respectively.

Results: The waist circumference had a linear association with A1C in both men (P=0.001) and women (P<0.001). An A1C level of 5.7% corresponded to a waist circumference of 98.4, 102.4 and 106.4 cm in men and 96.1, 96.6 and 97.0 cm in women at ages 30, 50 and 70 respectively. An A1C level of 6.5% corresponded to a waist circumference of 101.5, 105.4 and 109.4 cm in men and 103.4, 103.9 and 104.4 cm in women at ages 30, 50 and 70 years respectively. The waist circumference increased significantly with age in men (P<0.001) but only slightly in women. The linear relationship between waist circumference and A1C was seen in all non-Hispanic whites (men, P=0.013; women, P<0.001), non-Hispanic blacks (men, P<0.001; women, P=0.013), and Mexican American women (P=0.001).

Conclusions: A1C level increases linearly with waist circumference. A smaller waist circumference corresponds to a lower A1C level in both men and women. This association is seen among all ethnic groups except Mexican American men. In men, the waist circumferences associated with pre-diabetes and diabetes change with age. Our results reveal that younger American men with a waist circumference below 100 cm are already at risk of pre-diabetes.

Acknowledgment: Support from the Faculty Development Fund is gratefully acknowledged

3.

Glycaemic Control and Extent of Cardiovascular Disease

C.L. Lau¹, P.T. Tsui¹, C.L. Lau¹, N.Y. Chan¹, C.C. Choy¹, D. Chow¹, J. Chu¹, H.C. Yuen¹, D. Fong¹, N.S. Mok¹, S.T. Lau¹

¹Department of Medicine and Geriatrics, Princess Margaret Hospital, HKSAR

Objectives: Diabetic patients are known to have more extensive coronary artery disease and more frequent concomitant non-coronary macro-vascular or micro-vascular complications than non-diabetic patients. This study aimed to study the relationship between glycaemic control and extent of cardiovascular diseases.

Methods: This was a retrospective case series study conducted in cardiac intervention center of Princess Margaret Hospital on patients who had percutaneous coronary intervention (PCI) in 2010.

Results: Five hundred and eleven consecutive patients (18% female, 82% male) of age 63+/-11 were recruited. Underlying cardiovascular risk factors were diabetes (38%), hypertension (62%), hyperlipidemia (87%), current or history of smoking (46%). Sixty percent of PCI patients presented with acute myocardial infarction (AMI) without prior history of typical angina. Thirty-six percent presented with typical angina with or without AMI. Four percent were totally asymptomatic. Twenty-eight percent had HbA1c>8%. Diabetic patients were more likely than non-diabetics to have 3-vessel disease (3VD) [39% versus 24%], peripheral vascular disease (PVD) [5% versus 1%], cerebrovascular disease (CVD) [12% versus 5%], and creatinine>120umol/L (CRI) [25% versus 5%]. Eighty percent of diabetics and 52% of non-diabetics had concomitant hypertension. Diabetic patients with HbA1c>8% were more likely than diabetic patients with HbA1c<=8% to have 3VD (54% versus 34%), PVD (6% versus 4%), CVD (17% versus 9%), and CRI (35% versus 24%). By multivariate analysis, diabetes was an independent correlation factor of CRI and extensive macro-vascular complications (3VD, PVD, CVD). Among diabetic patients, HbA1c>8% was an independent correlation factor of CRI and extensive macro-vascular complications (3VD, PVD, CVD)

Conclusion: Diabetic patients, especially those with HbA1c>8%, are more likely to have extensive macro-vascular complications and concomitant chronic renal impairment than non-diabetics.

4.

Longitudinal Strain Predicts High Risk Patients with Acute Coronary Syndrome

W. C. W. Lam¹, L. Cheung¹, T. Liu¹, M. Tang¹, K. W. Chan¹

¹Division of Cardiology, North District Hospital

Background: Myocardial strain is an advance echocardiographic parameter for left ventricular (LV) myocardial function assessment. The aim of this study is to evaluate the role of two-dimensional longitudinal strain in risk stratification in acute coronary syndrome (ACS).

Methods: In addition to standard two-dimensional (2D) transthoracic echocardiography, speckle-tracking derived strain analysis was performed in ACS patients admitted to North District Hospital (NDH). Global longitudinal peak systolic strains (GLPSS) were analyzed in 78 ACS patients and 20 normal control subjects. Coronary angiograms and subsequent revascularization were performed in all 78 ACS patients. Angiographic and echocardiographic findings were compared.

Results: ACS patients were categorized into 4 groups according to their angiographic findings, single vessel disease (1VD), double vessel disease (2VD), triple vessel disease (3VD), and significant left main disease (LMD). Smokers and diabetics were significantly more prevalent in 3VD and LMD groups. There was statistically significant reduction in ejection fraction and GLPSS in 3VD and LMD patients (see table).

	Control (N=20)	Minor (N=11)	1VD (N=37)	2VD (N=18)	3VD (N=12)	LM (N=6)	P
EF	68.83 ± 7.45	55.25 ± 18.87	53.49 ± 11.55	54.17 ± 12.07	48.67 ± 21.3	45.67 ± 16.57	0.000
LVEDD	NA	4.84 ± 0.73	4.74 ± 0.87	4.2 ± 0.59	5.38 ± 1.03	5.25 ± 1.02	0.000
WMSI	1.0	1.40 ± 0.65	1.39 ± 0.43	1.38 ± 0.39	1.68 ± 0.65	1.66 ± 0.61	0.001
GLPSS	-21.08 ± 3.2	-15.82 ± 6.86	-15.03 ± 4.2	-14.67 ± 3.86	-12.67 ± 3.75	-13.0 ± 4.38	0.000

Conclusion: Patients with high risk coronary stenosis, as defined as triple vessel disease and left main disease, had lower global longitudinal peak systolic strain values. This phenomenon may enable clinicians to identify high risk ACS patients, particularly those with no obvious regional wall motion abnormality on 2D echocardiography.

ABSTRACTS

Abstracts for Free Paper Session:

50.

Comparing Percutaneous Coronary Intervention and Thrombolysis in Patients with Return of Spontaneous Circulation after Out-of-hospital Cardiac Arrest

X. Li¹, Y.Q. Li¹, X.X. Liao¹, C.L. Hu¹, R. Liu¹, H.Y. Wei¹

¹The Department of Emergency of the First Affiliated Hospital, Sun Yat-sen University, People's Republic of China

Aims: To evaluate the effect of percutaneous coronary intervention (PCI) or thrombolysis, in patients with return of spontaneous circulation (ROSC) after out-of-hospital cardiac arrest (OHCA), in the presence of ST-elevation myocardial infarction (STEMI).

Methods: We performed a meta-analysis of clinical studies located in PUBMED and MEDLINE databases from January 1995 to October 2011. The hospital discharge and neurological recovery rates, of patients with and without PCI or thrombolysis, were assessed in patients with ROSC after OHCA in the presence of STEMI. Furthermore, we also compared the differences in hospital discharge and neurological recovery rates between patient groups who received PCI or thrombolysis.

Results: The meta-analysis showed that the rate of hospital discharge and neurological recovery improved with both PCI and thrombolysis in patients with ROSC after OHCA, in the presence of STEMI. We also found that there were not significant differences between with PCI and with thrombolysis in the rate of hospital discharge and neurological recovery for the patients with ROSC after OHCA.

Conclusion: In patients with ROSC after OHCA in the presence of STEMI, both PCI and thrombolysis improved hospital discharge and neurological recovery rates. Furthermore, there were similar efficacy in hospital discharge and neurological recovery rates between with PCI and with thrombolysis.

Keywords: meta-analysis, out-of-hospital cardiac arrest, return of spontaneous circulation, ST-elevation myocardial infarction, percutaneous coronary intervention, thrombolysis.

ABSTRACTS

Abstracts for Free Paper Session:

PERCUTANEOUS CORONARY INTERVENTION (I)

5.

Transradial Approach for Coronary Angiography and Percutaneous Coronary Intervention in the Hong Kong Sanatorium and Hospital Cardiac Catheterization & Intervention Centre

S.L. Kan¹ and S. E. Lim¹, C. Huie¹, V. Kwok¹

¹Hong Kong Sanatorium and Hospital Cardiac Catheterization & Intervention Centre

Purpose: There has been progressive acceptance of the transradial approach for coronary angiography and percutaneous coronary intervention (PCI) in the last few years. Internationally, approximately 20% of procedures are performed using the radial route as this approach has demonstrated a consistent reduction in bleeding and vascular complications. In particular, primary PCI using radial artery access is associated with lower short-term mortality, reduced access site bleeding complications (haematomas) as well as a lower risk of myocardial infarction. Longer procedure times however have limited utilization in some countries, though transition of a catheterization laboratory to a preferred radial approach is feasible. The Hong Kong Sanatorium and Hospital (HKSH) Cardiac Catheterization Laboratory has embraced the use of the transradial approach for both diagnostic and therapeutic cardiac catheterization procedures and implemented this change in 2004. This presentation summarizes the data collected from 2004 to 2008.

Methods: A data collection form consisting of the type of approach, procedure performed, vessels involved, type and size of sheath used and major complications was filled in by the cardiac catheterization nurse prior to the performance of the diagnostic or therapeutic procedure in the cardiac catheterization laboratory. Analysis was made on the forms received from 2004 to 2008.

Results: From 2004 to 2008 the HKSH Cardiac Catheterization Laboratory has seen an increase in the percentage of procedures that have elected the use of the transradial approach for access for coronary angiography and PCI. In 2008 the radial approach formed 65% of coronary angiographs and PCIs performed in the Catheterization Laboratory. Our centre has noted a decreasing trend of procedures with failed radial access converting to femoral access from 12% in 2005 to 4% in 2008, a frequency less than the international procedural failure rate of 5% which is most likely due to the increased experience of our operators. There has also been a dramatic increase in the number of left main stem PCI using the transradial approach from 10% in 2004 to 67% in 2008, which previously was mostly amenable to CABG surgery. Overall complication rates especially pertaining to haematomas and vascular injury are less than 1%.

Conclusion: The radial approach now forms a significant route of access for cardiac catheterization in our centre. Overall complication rates of the centre remain low supporting the radial approach as the primary access site in PCI even in complex cases involving left main stem stenosis.

6.

Conventional Coronary Angiogram vs Hybrid Rotational Coronary Angiogram

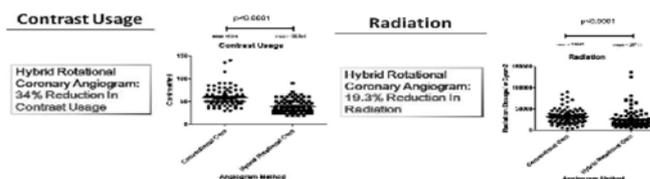
H. Lam¹, K.L. Chui¹, Y.H. Chan¹, K.C. Ko¹, P.W. Yam¹, W.K. Lai¹, K.F. Tse¹, C.S. Lam¹, L. Chow¹, M.L. Wong¹

¹Tuen Mun Hospital, Hong Kong

Background: CT Coronary Angiogram requires far less radiation, contrast and procedure time nowadays. How to reduce contrast load and radiation exposure in invasive coronary angiogram becomes an important issue. A new coronary angiogram protocol – Hybrid Rotational Coronary Angiogram, which is rotational angiogram on the left coronary arteries and conventional angiogram on the right, may be the answer.

Methods: This is a retrospective observational study on the safety and efficacy on conventional coronary angiogram versus rotational coronary angiogram. 200 consecutive cases undergoing two different coronary angiogram protocols during 09/2010-12/2010 were studied. Differences in contrast usage, procedure time and radiation were analyzed. Complications, including shock, myocardial infarction, arrhythmia, stroke, death and bleeding, were reviewed.

Results: Hybrid rotational coronary angiogram was associated with 34% reduction in contrast usage ($p < 0.0001$) and 19.5% reduction in radiation ($p < 0.0001$). There was no increase in procedure time ($p = ns$). Complications were zero in the 100 hybrid rotational coronary angiogram patients. In conventional angiogram, one ventricular fibrillation was noted.



Conclusion: Hybrid rotational coronary angiogram is safe and has been shown to reduce contrast usage and radiation exposure when compared to conventional coronary angiogram.

7.

Safety of Deferring Intervention by measuring Fractional Flow Reserve in Coronary Heart Disease

CL Lau¹, PT Tsui¹, YK Lo¹, NY Chan¹, CC Choy¹, D. Fong¹, D. Chow¹, H.C. Yuen¹, P.S. Chu¹, N.S. Mok¹, S.T. Lau¹

¹Department of Medicine and Geriatrics, Princess Margaret Hospital, HKSAR

Objective: Coronary artery stenosis ranges from mild (<50%), moderate (50-70%) to severe (>70%). Percutaneous coronary intervention (PCI) is usually not required for mild stenosis, equivocal for moderate lesion and preferably for severe stenosis. Functional studies performed before PCI can determine whether a coronary artery is causing ischemia and thus need for PCI. Measuring fractional flow reserve (FFR) is a functional test that can be done during PCI by a pressure wire. It can identify which artery or specific lesion in an artery is causing ischemia. Recent studies have shown that PCI guided by FFR reduced long term mortality or myocardial infarction compared with PCI guided by visual angiographic assessment.

Method: This was a retrospective case series study conducted in cardiac intervention center of Princess Margaret Hospital on patients who had FFR measured during PCI. PCI was deferred in lesion with FFR>0.8.

Results: One hundred twenty-three consecutive patients (21 female, 102 male) of age 61+/-10 were recruited. Underlying cardiovascular risk factors were diabetes (27%), hypertension (46%), hyperlipidemia (58%), current or history of smoking (30%). Prior myocardial infarction (MI) was present in 43 (35%) patients. Measuring FFR has been unequivocal and successful in all cases. FFR was measured in 89 lesions in left anterior descending artery (LAD), 52 lesions in left circumflex artery (LCX) and 37 lesions in right coronary artery (RCA). Stenting was avoided in 55 (62%) lesions in LAD, 40 (77%) lesions in LCX and 24 (65%) lesions in RCA. After follow-up of 545+/-104 days, none of the PCI deferred patients had MI. There were six PCI deferred patients readmitted for atypical chest pain. None of them had MI. One patient received PCI in another hospital and was readmitted again for chest pain after PCI. There were 4 deaths in the PCI group. Two were sudden cardiac death and the other two were related to concomitant illnesses. There were also 2 MI in the PCI group.

Conclusion: Measuring FFR in equivocal lesions is practically convenient, cost-effective and safe by avoiding unnecessary coronary stenting.

8.

Medium Term Outcome of Unprotected Left Main Stenting

C.L. Lau¹, P.T. Tsui¹, Y.K. Lo¹, N.Y. Chan¹, C.C. Choy¹, H.C. Yuen¹, P.S. Chu¹, N.S. Mok¹, S.T. Lau¹

¹Department of Medicine and Geriatrics, Princess Margaret Hospital, HKSAR

Background: Coronary artery disease involving left main is serious and life threatening. Unprotected left main stenting is an option for patients who refuse coronary artery bypass surgery and accept higher risk of re-do target vessel revascularization (TVR).

Methods: This was a retrospective case series study conducted in cardiac intervention center of Princess Margaret Hospital on patients who had undergone unprotected left main stenting.

Results: Fifty-eight consecutive patients (8 female, 50 male) of age 65+/-9 were recruited. Underlying cardiovascular risk factors were diabetes (38%), hypertension (60%), hyperlipidemia (91%), current or history of smoking (55%). Twenty-six (45%) had prior history of myocardial infarction (MI). Fifty-three (91%) had distal left main bifurcation lesions and 5 (9%) had ostial or body left main disease. Fifty-seven patients had concurrent disease in one or more of the three main coronary arteries: 1-vessel (16%), 2-vessel (29%) and 3-vessel (53%). Only 8 out of 53 distal left main lesions received two stents (5 T-, 1 culotte, 1 crush and 1 kissing stenting). Four patients received bare metal stent in main branch while the rest had drug-eluting stents. The main branch stent size and length were 3.5+/-0.4mm and 22+/-7mm respectively. The maximum balloon size was 3.8+/-0.4mm and maximum inflation pressure 16+/-3 atmospheres. High pressure post-dilatation and kissing balloon inflation was performed in 51 (88%) and 28 (48%) respectively. Fifty-six (97%) had intravascular ultrasonography assessment. This cohort was followed up for 845+/-478 days. Thirteen (22%) patients had major adverse cardiovascular events: 4 target vessel revascularization, 6 all cause mortality and 1 non-fatal MI.

Conclusion: The medium term clinical outcome of unprotected left main stenting is comparable to published international data.

ABSTRACTS

Abstracts for Free Paper Session:

HEART FAILURE AND HYPERTENSION

9.

Do Thiazides still have a Place as First-line Agents for Hypertension?

S. SW Chan¹

¹Emergency Department, Prince of Wales Hospital, The Chinese University of Hong Kong, Hong Kong.

Introduction: The UK National Institute for Health and Clinical Excellence (NICE) 2011 guidelines recommend that, for first-line treatment of hypertension, patients under age 55 years should be prescribed an angiotensin converting enzyme inhibitor (ACEI), while patients above age 55 years should be offered a calcium channel blocker (CCB). In these guidelines, thiazide-like diuretics had been removed as first-line antihypertensive drug, compared to the previous version in 2006. However, current European, Australian, Canadian and American guidelines still include thiazide diuretics in their first-line recommendations.

Purpose: To answer the question: In adults with hypertension, does the use of thiazide diuretics compared to placebo, no treatment or other anti-hypertensive medications have better or worse outcomes?

Methods: A literature search was performed as described below.

Population: adults with hypertension. **Intervention:** thiazide diuretics. **Comparator:** placebo or no treatment, other anti-hypertensive medications

Outcomes: cardiovascular related morbidity and mortality, efficacy in lowering blood pressure, cost, and adverse effects. **Search strategy:** using search terms 'hypertension' and 'thiazide', refined to include only review articles.

Databases used: Medline (OVID), Embase, NICE, NHS Evidence, and Cochrane Database of Systematic Reviews. Returned articles were screened for relevance and critically appraised using a checklist from the Centre for Evidence-based Medicine, Oxford University.

Results: Three studies were identified:

1. "Thiazide diuretics as first-line treatment for hypertension: meta-analysis and economic evaluation" from the Canadian Agency for Drugs and Technologies in Health, 2007.
2. "First-line drugs for hypertension" from Cochrane Database of Systematic Reviews, 2009.
3. NICE guidelines 2011: Hypertension: clinical management of primary hypertension in adults (update).

Relevant findings: Compared to placebo or no treatment, thiazide diuretics significantly reduced the risks of all-cardiovascular events, stroke, cerebrovascular events and cardiovascular death - results from at least 19 RCTs including 39,713 participants. Compared to thiazides, ACEIs are associated with higher incidence of strokes (RR 1.13, 95% CI 1.02 to 1.25), and CCBs have a significantly higher incidence of heart failure (RR 1.38, 95% CI 1.25 to 1.53).

Conclusion: Thiazides still have a place as first-line agents for hypertension.

10.

Novel Use of Non-invasive Hemodynamic Monitoring Device in a patient with Extra-corporeal Circulatory Support

A.Y.T. Wong¹, M.K.L. Wong¹, R.H.W. Chan¹, Y.M. Lam¹, S.W.L. Lee¹, S.C.C. Lam¹, J.S.H. Hai¹, M.P.H. Chan¹, F.C.C. Tam¹, A.S.Y. Yung¹

¹Department of Medicine, Queen Mary Hospital, Hong Kong

A 63-year-old man presented to our hospital for worsening dyspnea. He ran into cardiogenic shock with BP ~50/30mmHg, and developed VT quickly on arrival. Resuscitation was done. Inotropes were started. ECG showed sinus tachycardia with LBBB. Bedside echocardiogram revealed globally impaired left ventricular ejection fraction, with better contraction in anterior wall. Emergent coronary angiogram revealed thrombotic LCX occlusion, critical LAD disease with left to right collaterals and distal RCA CTO. Primary PCI was then proceeded with stenting to LAD and LCX. Venous-arterial Extra-corporeal Membrane Oxygenation (VA-ECMO) was set up for circulatory support in view of persistent cardiogenic shock.

Patient gradually recovered over the next few days, with LVEF improved from ~15% to ~30%. We proceeded to weaning of ECMO.

A novel realtime non-invasive hemodynamic monitoring device (Nexfin® from BMEYE) was used to guide the ECMO weaning process. The device can monitor stroke volume, cardiac output and other hemodynamic parameters beat-by-beat. ECMO flow was deliberately cut down from 1.9L/min to 0.5L/min as a test of the weaning process. Traditionally many circumferential parameters are measured during this period to assess the adequacy of end-organ perfusion. In this case, Nexfin® was also employed throughout this period to observe the change of intrinsic cardiac function before and after the ECMO flow adjustment. It was noted that during this period the stroke volume increased from 36.76ml ± 2.64ml to 41.18ml ± 2.08ml (p<0.001), while the cardiac output increased from 3.08L/min ± 0.20L/min to 3.51L/min ± 0.19L/min (p=0.027). The heart rate only minimally increased from 83.9/min ± 1.7/min to 85.3/min ± 1.4/min (p<0.001). This signified good myocardial response to decreased extracorporeal support. ECMO was thus successfully weaned off.

We described a case where realtime non-invasive hemodynamic monitoring device can be used as guidance for the weaning process of an ECMO support system.

11.

Clinical Application of Peripheral Venous-arterial Extracorporeal Membrane Oxygenation for Non-Surgical Indications

M.K.L. Wong¹, F.C.C. Tam¹, S.W.C. Sin¹, A.S.Y. Yung¹, A.Y.T. Wong¹, R.H.W. Chan¹, S.W.L. Lee¹

¹Queen Mary Hospital, Hong Kong

Background: Venous-arterial Extracorporeal Membrane Oxygenation (VA-ECMO) application in adult population is growing globally as both mechanical circulatory support (MCS) as well as extra-corporeal cardiopulmonary resuscitation (E-CPR). With the advance in technique and circuit design, peripheral VA-ECMO can now provide excellent circulatory support with improved patient outcome. We would like to report the experience of peripheral VA-ECMO as MCS and E-CPR for patients with non-surgical indications.

Methods: Consecutive recipients of venous-arterial extracorporeal membrane oxygenation for mechanical circulatory support or extra-corporeal cardiopulmonary resuscitation for non-surgical indications from October 2010 to December 2011 were included. Patient characteristics, indications as well as clinical outcome were reviewed. **Results:** During the study period, 10 patients received venous-arterial extracorporeal membrane oxygenation (VA-ECMO) for either mechanical circulatory support or extra-corporeal cardiopulmonary resuscitation (E-CPR) for non-surgical indications. All of them received peripheral form of VA-ECMO. The indications for mechanical circulatory support (MCS) include acute myocarditis (2 patients), thyroid storm (2 patients), dilated cardiomyopathy or right heart failure (3 patients), ventricular tachycardia storm (1 patient) and extracorporeal cardiopulmonary resuscitation (E-CPR) (2 patients). Six out of eight patients received VA ECMO as MCS survived till discharge (75% hospital survival) while all the two patients received VA-ECMO for E-CPR died despite ECMO support. Overall survival rate is 60%. During VA-ECMO period, five patients developed critical limb ischemia due to VA-ECMO arterial cannula which was alleviated after insertion of reperfusion catheter and no limb amputation is required.

Conclusion: VA-ECMO is an effective circulatory support technique for patients with non-surgical indications. Peripheral set up of VA ECMO can provide adequate circulatory support and lower limb ischemic complication can be alleviated with appropriate use of

12.

The Prognostic Value of Serial NT-proBNP Monitoring in the Management of Congestive Heart Failure in Chinese

C.H. Lam¹

¹Pamela Youde Nethersole Eastern Hospital, Chai Wan, Hong Kong

Background: Heart failure is a major health burden with high rate of readmissions and mortality. NT-proBNP level has been showed to be a useful prognostic tool of outcome in the management of patients with heart failure. A large proportion of subjects in previous international studies include those with impaired left ventricular systolic function. In our local population, however, the percentage of heart failure patients with preserved left ventricular ejection fraction (LVEF) is rather high among patients admitted for decompensated heart failure.

Purpose: This study explores the prognostic role of serial NT-proBNP in the local Chinese patients with congestive heart failure.

Methods: This was a single centre, prospective study of patients who were admitted to the acute medical wards of a regional hospital with the clinical diagnosis of congestive heart failure between October 2009 and August 2010. Serial NT-proBNP concentrations were measured on hospital discharge and out-patient follow-up. Patients were followed up for 6 months. The primary endpoint was hospital readmission due to heart failure or all-cause mortality at 6 months.

Results: 91 patients were recruited. Echocardiography was performed in 89 patients, 70.8% of those who had echocardiography performed had a preserved LVEF (LVEF ≥ 50%). Independent variables associated with readmission were NT-proBNP drop < 40% on follow-up, haemoglobin level on admission and duration on of heart failure. Creatinine level on admission was showed to be correlated with 6-month all-cause mortality.

Conclusions: Serial changes of NT-proBNP concentrations are associated with 6-month readmissions. It can be a useful prognostic marker in the management of heart failure in local Chinese patients with high prevalence of preserved LVEF.

ABSTRACTS

Abstracts for Free Paper Session:

PERCUTANEOUS CORONARY INTERVENTION (II)

- 13.**
Six months clinical outcome for the treatment of in-stent restenosis with newer generation compared to first generation drug-eluting stents
 R.C.Y. Fung¹, C.S. Yue¹, C.K. Chan¹
¹Division of Cardiology, Department of Medicine and Geriatrics, United Christian Hospital, Hong Kong
- Purpose:** The safety and efficacy of first generation drug-eluting stents (DES) in the treatment of in-stent restenosis (ISR) has been verified. In this study, patients with bare metal ISR diagnosed angiographically between 1 Jan 2006 and 31 June 2011 treated with either first generation (sirolimus or paclitaxel) or newer generation (zotarolimus or everolimus or biolimus) DES were recruited. Their 6 months clinical outcome was compared.
- Method:** Patients who had bare metal ISR treated with DES in the United Christian Hospital between 1 Jan 2006 and 31 June 2011 were included. Those who have mixed generation drug DES or balloon angioplasty alone were excluded. Demographic data was retrieved from our clinical records and percutaneous coronary intervention registry. Patients' baseline parameters including clinical presentation, age, gender, smoking status, left ventricular ejection fraction, previous history of cardiovascular disease, previous coronary intervention, comorbidities including diabetes mellitus, hypertension, hyperlipidaemia, peripheral vascular disease, renal impairment and medications prescribed were collected. Angiographic data including target vessel, ISR patterns, total stent length, maximal inflation pressure were compared. Data regarding their clinical outcomes were retrieved from the computer based clinical record. Major adverse cardiac events were defined as total mortality, target lesion revascularization (TVR) and myocardial infarction.
- Results:** A total of 69 patients were included. Thirty patients were treated with first generation (paclitaxel and sirolimus) stents and thirty-nine patients were treated with new generation (everolimus, zotarolimus, biolimus) stents. Baseline characteristics were similar between the two groups, except for the number of left main (LM) ISR and the maximal inflation pressure for stent deployment. More LM ISR was treated with the newer generation stents (7 vs 1, P=0.06). And the maximal inflation pressure was significantly higher in the first generation stents group (17 ± 4.9 mmHg vs. 14 ± 2.0 mmHg, P < 0.05). There was no stent thrombosis and target lesion revascularization. Three patients had nonfatal myocardial infarctions in the first generation DES group. One patient died of acute pulmonary oedema and 3 patients developed non-fatal myocardial infarctions in the newer generation DES group. Cox regression analysis showed no significant difference in incidence of MACE between patients treated with newer generation and first generation DES (10.3% vs 10%, RR 1.1, P = 0.92).
- Conclusion:** In this study, clinical outcome of the treatment of ISR with newer generation DES was comparable to that of the first generation DES. They may be a promising option for the treatment of bare metal ISR.
- 14.**
Drug-Eluting Balloon In The Treatment of Restenosis After Drug-Eluting Stent Implantation for Left Main Coronary Artery Disease – a Single Center Experience
 Ka-Yip Lo¹, Chi-Kin Chan¹, Chiu-Sun Yue¹
¹Division of Cardiology, Department of Medicine and Geriatrics, United Christian Hospital, HKSAR
- Purpose:** The use of percutaneous coronary intervention (PCI) to treat left main coronary artery (LMCA) disease has been encouraged by the availability of drug-eluting stents (DES), which significantly reduces the rates of restenosis and repeating revascularization. However, there is limited data on the treatment of patients with in-stent restenosis (ISR) after DES treatment for unprotected LMCA disease. Treatment options including bypass surgery, repeating PCI or medical treatment have not been evaluated in randomized trial. Thus, the optimal approach is not certain. The aim of this study was to review our experience in using drug-eluting balloon (DEB) in this unresolved area.
- Methods:** Between March 2010 and February 2012, five patients (3 men, median age 69, and range 65-80) were treated with DEB for DES-ISR in LMCA disease. Patient's clinical characteristics, procedural data, angiographic and clinical outcome were analyzed retrospectively.
- Results:** 60% of patients had previous bare-metal stent implantation at left main. All patients were treated with two-stents strategies by DES for left main bifurcation lesions (Four by T-stenting and one by Culotte-stenting technique). 60% of patients had ISR of the side branch only (left circumflex artery) while the others had ISR involving both the main and side branches. Overall seven DEBs were used with balloon size ranged from 2.5 to 3.5mm, length from 14 to 30mm. In all cases, inflation time of 60 seconds was achieved. The procedure was successful in all patients. Surveillance angiography three to six months later showed no significant ISR in all available cases (available in four patients). No major adverse cardiac events were reported at one-year. However, one patient suffered from unstable angina and target-vessel revascularization 16 months after DEB treatment.
- Conclusion:** In selected patients with DES-ISR in LMCA disease, our result with treatment by DEB was acceptable. DEB may be an acceptable alternative in selected patients.
- 15.**
Plavix Resistance in Hong Kong by VASP (Preliminary report of PR Hong Kong Study)
 H. Lam¹, Y.H. Wong¹, H.M. Mak¹, L.F. Lam¹, K.K. Yeung¹, Y.H. Chan¹, K.C.Ko¹, W.F. Leung¹, K.L. Chui¹, L.L. Ip¹, C.W. Wong¹, M.L. Wong¹, W.K. Lai¹, K.F. Tse¹, C.S. Lam¹, L. Chow¹, P.W. Yam¹, S.F. Yip¹
¹Department of Medicine and Geriatrics and Department of Clinical Pathology, Tuen Mun Hospital
- Background:** There are two classes of platelet function tests to determine clopidogrel resistance in patients. The more specific and well accepted one is the vasodilator stimulated phosphoprotein phosphorylation assay (VASP) by using flow cytometry via signaling through P2Y12. It has been proven to correlate with clinical events in patients after PCI. Prevalence of clopidogrel resistance in Hong Kong by using VASP has not been well studied. It may be different from using point of care system VerifyNow as they assess platelet function by two different mechanisms.
- Objective:** The study is to find out prevalence of clopidogrel resistance by VASP in our local population undergoing elective PCI.
- Method:** This is a prospective observational study. 60 consecutive patients from 09/2011-12/2011 undergoing elective PCI in Tuen Mun Hospital are selected for VASP assay by flow cytometry with written consent. Platelet Reactivity Index (PRI)>50 is used as cutoff for clopidogrel resistance. All patients are pretreated with clopidogrel 300mg as loading and 75mg as maintenance plus aspirin 160mg. Physicians are blind for test results till the end of the study.
- Results:** Platelet Reactivity Index (PRI) varying from 25.3 -95 by VASP assay are recorded among the 60 patients undergoing elective PCI. 71.7% of patients (n=43) are clopidogrel non responder with PRI>50. 28.3% of patients (n=17) show PRI>75.
- Conclusion:** It is alarming that clopidogrel resistance is very high in our population by VASP assay. If the study result can be confirmed again in other centers in Hong Kong, we may consider higher dosage of clopidogrel loading or change to newer antiplatelet treatment.
- 16.**
Platelet Function Tests Variability Study
 H. Lam¹, K.K. Yeung¹, L.F. Lam¹, H.M. Mak¹, P.W. Yam¹, Y.H. Chan¹, K.C.Ko¹, W.F. Leung¹, Y.H. Wong¹, K.L. Chui¹, L.L. Ip¹, C.W. Wong¹, M.L. Wong¹, W.K. Lai¹, K.F. Tse¹, C.S. Lam¹, L. Chow¹, S.F. Yip¹
¹Dept of Medicine & Geriatrics & Dept of Clinical Pathology, Tuen Mun Hospital
- Background:** Antiplatelet treatment failure leads to increase clinical events for patients undergoing PCI. Checking antiplatelet treatment efficacy before PCI to tailor the drug dosage becomes more and more popular. However, most of the studies are done with one platelet function test only. Comparison between different tests to check their consistency has not been well studied. Recently, a "POPular" Trial has studied different point of care antiplatelet function tests. It shows that some platelet function tests cannot demonstrate predictive value.
- Objective:** The study is to test consistency between different platelet function tests from the most popular point for care VerifyNow, to most well-accepted flow cytometry measurement of vasodilator-stimulated phosphoprotein phosphorylation (VASP) and the new WBA platelet function test (Whole Blood Impedance Aggregometry).
- Method:** This is a prospective observational trial. 31 consecutive patients undergoing elective PCI in Tuen Mun Hospital from 11/2011 to 12/2011 are selected for 3 different platelet function tests with written consent after elective PCI. All patients are treated with aspirin 160mg and clopidogrel 300mg loading plus 75mg maintenance. 20 healthy subjects (11 male and 9 female) were used to set up normal range.
- Results:** By VerifyNow, patients (n=31) show PRU 81-348. If we take PRU> 230 as cutoff, 54.8 % (n=17) patients are non responder. By VASP, patients (n=31) show PRI 25.5 -83.7. If we take PRI>50 as cutoff, 37.7% (n=21) patients are non responder. By WBA using collagen as platelet agonist, patients (n=23) shows 6 minutes impedance 2-19Ω. If we take >10Ω as cutoff value, 28.6% (n=6) patients are non responder. Comparison between VASP and VerifyNow (n=31) finds 61.3% (n=19) patients showing consistent result between the two tests, namely 38.7% inconsistency. Among 21 patients tested by all the 3 tests, only 28.6% (n=6) patients show consistent results between the tests.
- Conclusion:** This small study demonstrates the problem of inconsistency between different platelet function tests results, which may affect the clinical usage and it urges the need for searching a gold standard in platelet function test in the future, especially after GRAVITAS Trial. It is alarming to find high prevalence of non responder for antiplatelet treatment in our local population undergoing PCI.

ABSTRACTS

Abstracts for Free Paper Session:

48.

Prevalence of Non-responder to Clopidogrel in Patients with Coronary Artery Disease having Chest Discomfort – Experience from a Local Center

W.W.L Wong¹

¹St. Teresa's hospital, Hong Kong

Purpose: The presence of non-responder to Clopidogrel has been known as a risk factor for treatment failure and serious complication like stent thrombosis. However, there is no reliable clinical parameter that can predict which patient would be a non-responder. This observational study would like to find out the prevalence of non-responder in a group of patient with coronary artery disease on Clopidogrel

Methods: Patients with coronary artery disease on Clopidogrel who had experienced any chest discomfort in the absence of clinical evidence of ischemia during follow up would be advised to have a blood test for P2Y₁₂ inhibition. The clinical records of these patients who actually had the test done were reviewed at the end of the study period. According to the local laboratory, patients on a stable dose of Clopidogrel with an inhibition level less than 30% were defined as nonresponder. Results: The number of patient recruited were 49 from year 2010 till 2011. The male to female ratio were 5. 92% were Chinese. There were only 53% of patients being a responder with a level of inhibition of greater than 30%. Average level of P2Y₁₂ inhibition was only 10% among non-responders (ranged from 0 – 28%) and 53% among responders (ranged from 31 – 76%). 17 of the non-responders were switched to Prasugrel. 10 of them have repeated blood test for the P2Y₁₂ inhibition level, all showing an adequate level of inhibition with an average of 59% (ranged from 38 – 94%). 8% of patients reported easy bruising and epistaxis while on Clopidogrel.

Conclusion: Patients with coronary artery disease needed anti-platelet treatment may not have adequate response when they are non-responder to Clopidogrel. The prevalence could be higher than expected as was in the cohort of patients in this study. Patient as non-responder can be clinically silent or just with minimal symptom. More studies would be needed to see if routine surveillance for nonresponder is cost-effective among patients with coronary artery disease who need Clopidogrel treatment.

ABSTRACTS

Abstracts for Free Paper Session:

CARDIAC SURGERY (I)

17.
Postoperative Pain and Impact of Analgesics on Arterial Reactivity in Postmenopausal Women After Non-cardiovascular Surgery
 Wu Meng Jun¹, Chook Ping², Wei An Ning², Hu Yan Jun², Woo Kam Sang³
¹The Chengdu Women and Children Affiliated Hospital, ²The Second Affiliated Hospital, Chongqing University of Medical Sciences, ³The Chinese University of Hong Kong

Introduction : Cardiovascular (CV) events may complicate abdominal surgery in postmenopausal women, probably related to operative trauma and postoperative pain. Arterial reactivity (endothelium-dependant flow-mediated dilation, FMD) is an emerging novel atherosclerosis surrogate marker predictive of CV events.

Objectives: To evaluate the relationship between postoperative pain and impact of analgesic on FMD in postmenopausal women after abdominal surgery.

Patients & Methods: We enrolled 60 postmenopausal women, aged 60-80 years (mean 56.1±10.6 year) undergoing laparoscopic abdominal surgery. 30 patients were given continuous intravenous analgesics infusion (fentanyl and droperidol) (Analgesic Group), and 30 patients were treated with intramuscular dolantin 1-2 times on demand for first 24 hours (Control Group). Pain was assessed by visual analogue score (VAS).

Results: The 2 groups were comparable in their mean age, nature of surgeries, basal VAS and brachial FMD. VAS were increased and brachial FMD reduced at 2 hours postoperative compared with preoperative day-1 in both groups (p<0.05). Compared with Control Group, Analgesic Group had lower VAS and higher brachial FMD at postoperative 2 hours and day-1, and better preserved brachial FMD at day-5.

	CONTROL GROUP		ANALGESIC GROUP	
	VAS	FMD(%)	VAS	FMD(%)
Preoperative: day-1	0.8±1.3	7.1±1.6	0.6±1.1	7.3±1.4
Postoperative: 2 hrs	4.8±2.8	5.7±1.3	2.7±1.9**	6.5±1.3 ^a
day-1	3.1±1.4	5.9±0.9	1.7±1.2*	7.2±1.3 ^a
day-5	1.1±1.3	6.3±1.6	0.9±1.0	7.3±1.3 ^b

Compared with Control *p<0.03; **p<0.04; a:

p=0.001; b: p=0.015

Of the 60 women, VAS≥5 were independently associated with better brachial FMD (>6%) at postoperative 2 hours (OR=1.9, 95% CI 0.7 to 5.1, p<0.02).

Conclusion: Postoperative pain is inversely related to vascular reactivity in postmenopausal women, which is potentially ameliorated by upfront analgesic administration after abdominal surgery.

18.
Role of TRPC3 Channel in Human Internal Mammary Artery
 Gao Ge¹, Xiao-Yan Bai¹, Chao Xuan¹, Xiao-Cheng Liu¹, Wen-Bin Jing¹, Qin Yang^{1,2}, and Guo-Wei He^{1,3}

¹TEDA International Cardiovascular Hospital, Medical College, Nankai University, Tianjin, China; ²The Chinese University of Hong Kong, Hong Kong, China; ³Department of Surgery, Oregon Health and Science University, Portland, Oregon, U.S.A.

Purpose: Intracellular calcium regulation in endothelial cells depends on transient receptor potential channels (TRPs). Canonical TRPs (TRPCs) are now recognized as the most important Ca²⁺-permeable cation channels in vascular endothelium and TRPC3 channel is reported to play a role in vasodilation in animal vessels. However, little is known about the role of TRPCs in the human arteries. We therefore tested the hypothesis that TRPCs plays a role in the human arteries.

Methods: Cumulative concentration-relaxation curves to acetylcholine (-11 to -4.5 log M) were established in the human internal mammary artery (IMA) rings (n=36) taken from 21 patients undergoing coronary artery bypass grafting in pre-contraction induced by U46619 (-8 log M) in the absence or presence of SKF96365 (10 μmol/L) or Pyr3 (3 μmol/L). Protein expressions of TRPC3 were determined by Western Blot.

Results: The maximal relaxation induced by acetylcholine was significantly attenuated by the non-specific inhibitor of TRPCs, SKF96365 (45.9±3.9% vs. 63.5±1.4% in control, P<0.05) or the selective TRPC3 blocker, Pyr (56.1±4.2% vs. 65.7±2.7% in control, P<0.05). The protein expression of TRPC3 was detected in human IMA.

Conclusion: TRPC3 exists and plays a role in the acetylcholine-induced endothelium-dependent relaxation in the human IMA. This study suggests that TRPC3 may have the potential to be a new target in endothelial protection in patients with endothelial dysfunction such as in patients with coronary artery disease in order to improve the long term patency of the grafting vessels.

19.
Aortic Root Replacement Surgery – Approaching Zero Hospital Mortality
 C.K.L. Ho¹, L.C. Cheng¹, T.W.K. Au¹
¹Department of Cardiothoracic Surgery, Queen Mary Hospital, Hong Kong

Purpose: Retrospective analysis of consecutive aortic root replacement surgery in a single institution.

Methods: From January 2001 to November 2010, 93 patients underwent 94 aortic root replacement and 2 aortic root repair surgery. Aetiology included Marfan syndrome 42%, annulo-aortic ectasia 31%, non-Marfan aortic dissection 18% and aortitis 9%. Twenty-seven percent were emergency and 29% were reoperation.

Results: Bentall operation was performed in 87 patients, 7 had valve-sparing aortic root replacement and 2 had aortic root pseudoaneurysm repair after previous Bentall operation. Concomitant surgery included arch replacement in 9 patients, CABG [6], mitral [6], other cardiac surgery [3]. Deep hypothermia circulatory arrested were performed in 33 patients. There was only one in-hospital mortality [surgeon's factor]. Post-operative complications included bleeding required reopen 8%, wound infection 4%, minor stroke 3%, renal dialysis 2%, permanent pacemaker 2%, redo root surgery 1%. Follow up was 100%. There were 9 late deaths : 5 were Marfan syndrome with further dissection or progressive heart failure, 1 had cerebral hemorrhage, 1 had kidney cancer and dissection and 2 were unknown. Five years and 10 years actuarial survival were 83% and 79% respectively.

Conclusion: Aortic root replacement either by Bentall or valve-sparing technique is safe with low morbidity and approaching zero hospital mortality even in high risk patients. Surgeon's factor did affect the outcome.

20.
Pericardectomy for Constrictive Pericarditis in Modern Hong Kong: Results and Predictors of Outcome
 B.A. Rocha¹, T.L. Chan¹, K.L. Ho¹, F. Tsang¹, W.K. Au¹
¹Department of Cardiothoracic Surgery, Queen Mary Hospital, Hong Kong

Purpose: To assess the current demographics and outcome of patients referred for pericardectomy, and to identify risk factors for poor clinical outcome.

Methods: Retrospective review of all consecutive patients who had undergone pericardectomy for constrictive pericarditis from 1995-2011, from hospital data at Queen Mary Hospital & Grantham Hospital, Clinical Management System, and thru telephone interviews.

Results: 43 consecutive patients had pericardectomy during the studied period, with 13 females and 30 males. The mean follow-up time was 75 months. 49% were idiopathic, 34.9% were tuberculosis related and 9.3% were related to previous cardiac surgery. The most common presenting symptom was congestive heart failure (65%), followed by ascites (14%), pleural effusion (9.3%), and arrhythmias(7%).

All pericardectomies were performed via sternotomies, with 23% (10/42) requiring cardiopulmonary bypass. 16.3% (7/43) had concomitant procedures. The operative mortality was 11.6% (5/43), with 4/5 dying from post-op low output syndrome. The 10-year actuarial survival rate was 74%. When using operative mortality, event free survival and good symptomatic control (NYHA I) as outcome measures, the statistically significant common unfavorable factors were old age, poor pre-op NYHA class, need for concomitant procedures, poor pre-op renal function, and less extensive proportion of pericardectomy. Contrary to our previous belief, a prolonged period between diagnosis of constrictive pericarditis and pericardectomy does not cause worse clinical outcome.

Conclusion: Pericardectomy remains a high risk operation with good functional outcomes in late survivors. Tuberculosis remains a major cause of constrictive pericarditis in this locality. Advance age, poor NYHA grades, need for concomitant procedures, poor preoperative renal function, and a less extensive pericardectomy are factors for poor clinical outcome.

ABSTRACTS

Abstracts for Free Paper Session:

EP & ARRHYTHMIAS

- 21. Cardiac Genetic Service in Management of Inherited Arrhythmogenic Diseases – Pioneering Experience of a Regional Referral Centre**
 NS Mok¹, WT Poon², Chloe Mak², PT Tsui¹, NC Fong², KC Lee², ST Lau¹, KC Tse³, CW Lam⁴, Albert Chan²
¹Dept of Medicine & Geriatrics, PMH
²Dept. of Pathology, PMH
³Dept of Paediatrics & Adol Medicine, PMH
⁴Dept of Pathology, HKU
- Purpose:** Hong Kong is lagging behind her Asian counterparts in provision of cardiac genetic service which plays an important role in management of inherited arrhythmogenic diseases (IAD). Princess Margaret Hospital (PMH) is a regional referral centre for IAD and PMH genetic laboratory embarked on cardiac genetic service for management of IAD in 2007. We reported the results of molecular diagnosis and clinical profile of IAD in a cohort of local patients and their family members.
- Methods:** Clinical and genetic data of probands and their family members with a molecular diagnosis of IAD who received treatment and/or underwent genetic testing in PMH were reviewed and analysed.
- Results:** A total of 23 probands (M:F 17:6, mean age 36.8±24.5 years) had molecular diagnosis of IAD. Fifteen were confirmed by genetic laboratory in PMH and eight by other laboratories. All but one (96%) probands are Chinese. The molecular diagnosis was Brugada syndrome (BrS) with *SCN5A* mutations in seven; congenital long QT syndrome (LQTS) in six (LQT1 with *KCNQ1* mutations in three, LQT2 with *KCNH2* mutations in two and JLN2 with *KCNE1* mutation in one); catecholaminergic polymorphic VT (CPVT) with *RyR2* mutations in two; hypertrophic cardiomyopathy (HCM) in six (*MYH7* mutations in three and *MYBPC3* mutations in three) and arrhythmogenic right ventricular cardiomyopathy (ARVC) with *PKP2* mutations in two. Two probands had history of cardiac arrest, ten had syncope and nine had documented VT/VF. Six received ICD, one received pacemaker while 12 were on medical treatment. Thirty nine family members of 13 genotyped probands were screened for the known pathogenic mutations. Among them 18 were found to be mutation carriers (ARVC in six, HCM in two, LQTS in seven and BrS in three) and appropriate treatment and advice on lifestyle modifications were given accordingly. Family members with negative mutation were reassured without further investigation or long-term follow-up.
- Conclusion:** Genetic testing for IAD is feasible in Hong Kong and should be considered for diagnosis, risk stratification, guiding treatment and genetic counseling of patients and for family screening of known pathogenic mutations in IAD.
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- 22. Nonfluoroscopic Intracardiac Navigation System Guiding Cardiac Electrophysiologic Procedures – Pilot Experience in PMH**
 C.L. Lau¹, N.S. Mok¹, Y.K. Lo¹, P.S. Chu¹, H.C. Yuen¹, C.C. Choy¹, H.F. Chow¹, N.Y. Chan¹, P.T. Tsui¹, S.T. Lau¹
¹Cardiac Team, Princess Margaret Hospital, Hong Kong
- Purpose:** Fluoroscopy is required for positioning of diagnostic and mapping electrophysiologic catheters and guiding catheters in cardiac electrophysiologic procedures (CEP) which carries radiation hazards to both patients and doctors. Use of a non-fluoroscopic intracardiac navigation system (NINS) has been shown to reduce the fluoroscopy time in CEP. This abstract reported our initial experience in using NINS in guiding CEP.
- Method:** Fourteen consecutive patients who underwent CEP guided by NINS were included. The nature of arrhythmias was reviewed. Fluoroscopy time used in positioning of diagnostic and mapping electrophysiologic catheters and ablation of arrhythmias, as well as total procedural time were analysed.
- Results:** Three patients had no inducible arrhythmia. 11 patients had inducible arrhythmias with catheter ablation of the arrhythmogenic substrate done. Among them seven had WPW syndrome with inducible orthodromic AVRT, two had typical atrial flutter, one had AVNRT and one had dual mechanisms (AVRT and AVNRT). Catheter ablation (RF ablation in eight, cryoablation in two and both RF and cryoablation in one) was successful in all eleven patients without vascular or intracardiac complication. Positioning of the diagnostic electrophysiologic catheters was done without fluoroscopy in all but one patient who had atrial flutter with difficult right ventricular entry. In two patients, one with atrial flutter and the other with AVNRT, successful ablation was performed without any fluoroscopy. The mean (±SD) fluoroscopy time in catheter ablation and procedural time were 22±17 minutes and 151±60 minutes respectively.
- Conclusion:** Our initial experience showed that the use of NINS in guiding CEP is feasible and safe and has a potential to reduce fluoroscopy time and radiation hazards in CEP.
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- 23. Reduction of fluoroscopy exposure in catheter ablation of atrioventricular nodal re-entrant tachycardia and accessory pathway using the three-dimensional mapping system: initial experience in Hong Kong**
 M.C. Choi¹, K.T. Lee¹, H.L. Chan¹, C.H. Chau¹, K.L. Wu¹, S.H. Cheung¹, C.Y. Cheung¹, K.L. Tsui¹, K.K. Chan¹, S.K. Li¹
¹Department of Medicine, Pamela Youde Nethersole Eastern Hospital, Hong Kong
- Purpose:** Catheter ablation procedures carry radiation risk to patients and clinicians. Recent studies demonstrated that the use of 3D mapping systems reduced fluoroscopy time during ablation procedures of atrial arrhythmias. The purpose of our study was to assess the feasibility and safety of catheter ablation of atrioventricular nodal re-entrant tachycardia (AVNRT) and accessory pathway (AP) using the 3D mapping system.
- Methods:** From April 2011 to Feb 2012, we prospectively enrolled the patients with AVNRT or AP treated by catheter ablation guided by EnSite NavX system (Group A). These patients were compared with a matched control group of patients (Group B). We compared the success and complication rates, procedure and fluoroscopy time and number of ablations.
- Results:** 15 patients were enrolled in each group (8 AVNRT cases and 7 AP cases). Zero fluoroscopy was needed during electrophysiology study in all patients of group A. In 11/15 cases (73%) of group A, 3D mapping avoided fluoroscopy entirely during ablation procedure, including 4 cases requiring access to the left ventricles by a retrograde approach. The mean total fluoroscopy time was 6.5±13.2s in group A and 22.3±19.1s in group B (p<0.05). There was no significant difference in procedure times and number of ablation between two groups. All ablation procedures were successful without any major complication in both groups.
- Conclusion:** Catheter ablation of atrioventricular nodal re-entrant tachycardia and accessory pathway using the 3D mapping system is safe and feasible. It is associated with significantly reduction in fluoroscopy time, without increase in procedure time. This approach deserves consideration, particularly in patients at high radiation risk.
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- 24. To Observe the Short Term Therapeutic Effect of Intravenous Injection and Take Orally of Herbesser Sequentially on fast Atria Fibrillation**
 X.X. Liao¹, C.L. Hu¹, X. Li¹, R. Liu¹, H.Y. Wei¹
¹The Department of Emergency of the First Affiliated Hospital, Sun Yat-sen University, People's Republic of China
- Objective:** To explore the short term therapeutic effect of intravenous injection and take orally of Herbesser sequentially on fast atria fibrillation.
- Methods:** 106 patients with fast atria fibrillation origin from different cardiac diseases were enrolled and randomly divided into Control group and Observation group. The patients in Control group were treated by intravenous injection cedilanid and oral digoxin, the other patients in Observation group were treated by intravenous injection and take orally of Herbesser sequentially. To observe and compare the effects of different therapy methods in controlling the ventricular rate during the hospital stay and within 4 weeks after hospital discharge.
- Results:** There were 53 patients in each group, the ratio of gender and age were no difference between two groups. The effective power were 98.1% in Herbesser group, higher than 77.2% in intravenous injection cedilanid and oral digoxin group, P=0.002. The rates of ventricular attain the target were 84.9%, 81.1%, 79.2% and 77.4% in Herbesser group within 4 weeks after hospital discharge higher than 66%, 55.6%, 55.6% and 47.2% in cedilanid and oral digoxin group (P= 0.041, 0.011, 0.021 and 0.002 respectively).
- Conclusions:** The methods of intravenous injection and take orally of Herbesser sequentially can effectively control the ventricular rate of fast atrial fibrillation, and the effect was super the combination of cedilanid and oral digoxin.
- Keywords:** Herbesser; cedilanid digoxin; fast atrial fibrillation

ABSTRACTS

Abstracts for Free Paper Session:

- 25. Prospective Cohort Study of Catheter Ablation of Persistent Atrial Fibrillation in a Single Centre**
 Y.K. Ko¹, J.Y.S. Chan¹, C.P. Chan¹, H.C.K. Chan¹, J.W.H. Fung¹, C.M.Yu¹
¹Division of Cardiology, Department of Medicine and Therapeutics, Prince of Wales Hospital, The Chinese University of Hong Kong.
- Purpose:** Catheter ablation for patients with drug-refractory symptomatic atrial fibrillation (AF) has become the recommended treatment in guidelines. The ablation procedure for persistent AF is technically more challenging with lower long term success rate compared with the procedure for paroxysmal AF. The purpose of this study was to access the long term success rate of radiofrequency catheter ablation for patients with persistent AF.
- Methods:** 39 consecutive patients (age 53.8 ± 12.2, 89.7% male, LA diameter 4.7 ± 0.8cm, LVEF 0.54 ± 0.15) with drug refractory persistent AF were studied. Ablation procedure was performed with 3D mapping system (Either Ensite or Carto system) and irrigated ablation catheter. After achieving pulmonary vein isolation, additional ablation targeting complex fractionated atrial electrogram (CFAE) and linear ablation were performed (including roof, mitral isthmus and cavotricuspid isthmus lines). Clinical recurrence of AF was defined as AF or atrial tachycardia (AT) (including atrial flutter) lasted more than one minute in duration.
- Results:** The mean duration of AF was 53.2 ± 47.7 months before the ablation procedure. During the ablation procedure, in 10 patients (25.6%) AF was terminated (5 patients (12.8%) converted to AT, and 5 patients (12.8%) converted directly to sinus rhythm), and in 29 patients (74.4%) AF did not organize or terminate and was cardioverted. Duration the follow up time of 18 ± 11 months, 23 patients (59.0%) remained free from AF. 9 patients (23.1%) required more than one ablation procedure. 21 patients (53.8%) were taking anti-arrhythmic agents after the procedure. There is no statistical difference between group achieving AF termination and the non-termination group in terms of long term maintenance of sinus rhythm (P = 0.13)
- Conclusions:** Among patients with drug-refractory, symptomatic persistent AF, about 60% of them become AF-free after radiofrequency catheter ablation. And AF terminates or not during ablation procedure may not affect long term success in maintaining sinus rhythm.
- 49. Premature Ventricular Ectopic and Tachycardia Ablation from Right Ventricular Outflow Tract and Non Right Ventricular Outflow Tract sites**
 L.L. Cheung, C.P. Chan, Y.S. Chan, Y.K. Ko, W.H. Fung, C.K. Chan, C.M. Yu
- Background:** Frequent isolated premature ventricular complexes (PVCs) can lead to serious symptoms and left ventricular dysfunction even in patients without structural heart disease. Catheter ablation of PVCs, particularly if it originates from the right ventricular outflow tract (RVOT), has been achieved a cure rate of 90%. In this study, the comparison was made on the clinical outcome of patients underwent catheter ablation of PVCs from different origins.
- Method:** From February 2009 to March 2012, 37 consecutive patients (54% females) presenting with symptomatic frequent ventricular ectopics, were investigated electrophysiologically. The age range from 24 to 84, with a mean of 52.9 years. The mean Left ventricular ejection fraction was 57.4%. 20 patients (54%) had PVC arising from RVOT sites. 17 patients (46%) had PVC arising from non RVOT sites. Of these, Five (29%) were from anterior mitral annulus, three (8%) were from RV septum. 2 (5%) were from LVOT sites, 2 were from tricuspid valve, the rest were from RV papillary muscle, LV papillary muscle, left coronary cusp, right coronary cusp and one from mid posterolateral LV wall. Among those 20 patients with PVCs arising from RVOT, 14 patients (70%) were female, two patients (10%) had history of ventricular tachycardia. The mean age was 53+/-14 years. The mean LVEF were 61.7+/-7.6%. The mean duration of symptoms presented were 3.64+/-3years. In 17 patients with PVCs arising from non-RVOT site, 6 patients (37%) were female, 5 patients (29%) had history of ventricular tachycardia. The mean age was 52.5+/-18.3 years. The mean LVEF were 51+/-12%. The mean duration of symptoms presented was 4.87+/-6.8 years.
- Ablation was acutely successful in 19 patients (95%) with RVOT PVCs. None of them had complications. The acute successful rate was 100% in 17 patients of non-RVOT PVCs. Among them, one patient (1.5%) experienced transient complete heart block and recovered during the hospital stay. However, no death occurred acutely and two years after catheter ablation. During a follow up period of two years, 3 patients with non-RVOT PVCs (18%) had symptoms recurred and 1 patient with RVOT PVCs (5%) had symptoms recurred.
- Conclusions:** The results of this prospective study demonstrate a high acute success rate and a clinically negligible complication rate of catheter ablation of symptomatic frequent PVC regardless of the site of PVC origin. Catheter ablation for PVC arising from RVOT has a high success rate and relatively lower recurrence rate and should be considered as a non-pharmacological curative treatment for symptomatic patients.

ABSTRACTS

Abstracts for Free Paper Session:

CARDIAC SURGERY (II)

- 26. Mid-term Results of Concomitant Modified Maze Procedure for Chronic Atrial Fibrillation in Patients Undergoing Cardiac Surgery – A Chinese Prospective**
P.M.F. Lin¹, W.K. Au¹, T.L. Chan¹
¹Division of Cardiothoracic Surgery, Department of Surgery, University of Hong Kong, Queen Mary Hospital, Hong Kong
- Purposes:** Concurrent atrial ablation is now a common and standard procedure during cardiac surgery to treat atrial fibrillation. Success rate varies according to different disease population, techniques and definition. Although commonly performed, data and results on Chinese population are lacking. This study is to review the mid-term results of patients had undergone cardiac surgery and concomitant atrial ablation.
- Methods:** From 2005 to 2009, 122 consecutive patients with chronic atrial fibrillation associated with other cardiac problem had undergone modified maze III procedure as concomitant surgical ablation. Clinical and operative data was reviewed. Patients were followed up at 3 months and then every 6 months with ECG and clinical assessment.
- ults:** All patients suffered from chronic atrial fibrillation before operation, ranging from 1 to 220 months. Most patients associated with valvular surgery (93.4%), especially involving mitral valve (88.6%). There was 1 (0.8%) in-hospital death and 3 (2.4%) follow up mortality in this cohort. Mean follow up time was 36.7 months (ranging from 12 to 66). There were significant symptomatic improvement after surgery ($p < 0.001$), whether or not the rhythm successfully converted. The success rate increases from 63.6% at 3 months to 76.9% at 12 months. Some patients reverted back to atrial fibrillation, making overall rate of conversion at last follow up was 68.9%. The gain in success rate was contributed by trial of cardioversion, in which 24 patients (66.7%) became sinus afterwards. Longer duration of atrial fibrillation and larger the left atrium were poor prognostic factors for successful ablation.
- Conclusion:** Concomitant modified maze procedure is a safe and effective technique to treat chronic atrial fibrillation. Mid-term results in Chinese patients were satisfactory and comparable to other cohorts.
- 27. Surgery for Late Rheumatic Tricuspid Regurgitation with Previous Left Heart Valve Surgery – Repair vs. Replacement**
T.T.H. Ling¹, L.C. Cheng¹, C.K.L. Ho¹, T.W.K. Au¹
¹Department of Cardiothoracic Surgery, Queen Mary Hospital, Hong Kong
- Purpose:** The aim of this study was to compare the hospital mortality and mid-term outcome undergoing tricuspid replacement versus repair surgery for late significant rheumatic tricuspid regurgitation who had previous left heart valve(s) surgery.
- Methods:** Retrospective review of our data between January 2000 and August 2009. Out of 497 patients underwent tricuspid valve surgery in our institution, 173 patients had rheumatic disease with previous valves surgery performed. Fifty seven patients had tricuspid replacement [100% bioprosthesis]. In the repair group, 41 patients had simple De Vega annuloplasty and 75 patients had annuloplasty band. EuroSCORES of the tricuspid replacement group and repair group were 7.6 and 7.9 respectively. Twenty-one percent of the replacement group had previous tricuspid valve surgery compared to only 9% in the repair group [$p = 0.024$]. Concomitant procedures included mitral [56%], aortic [44%] and CABG [4%]. Follow up was 96% complete with mean 3.8 ± 2.4 years.
- Results:** The in-hospital mortality [16 death] was 11% for the replacement group compared to 9% for the repair group [$p = 0.75$]. Univariate analysis showed male sex, LVEF < 30%, cardiogenic shock, active endocarditis, ventilation pre-op, pulmonary hypertension, creatinine > 200 mmol/L and emergency were significant risk factors. Multivariate analysis revealed cardiogenic shock was the only significant factor [$p = 0.002$ and Exp(B) = 42.5] for in-hospital mortality. Post-operative complications were seen in 42% of the replacement group compared to 62% in the repair group. Late death occurred in 26 patients. The actuarial survival were 52% and 60% respectively for the replacement and the repair group at 8 years [Log-rank $p = 0.39$].
- Conclusion:** Surgery for late rheumatic tricuspid regurgitation carried considerable morbidity as well as mortality. However, tricuspid replacement had similar in-hospital mortality compared to tricuspid repair. Medium term outcome also did not showed significant difference between the 2 groups.
- 28. Minimally Invasive versus Conventional Sternotomy for Cardiac Surgery**
O. Lee¹, W.k. Au¹
¹Division of Cardiothoracic Surgery, Department of Surgery, University of Hong Kong, Queen Mary Hospital, Hong Kong
- Background/purpose:** The aim of this study is to compare minimally invasive cardiac operations with conventional cardiac operations in terms of post-operative pain, length of hospital stay, post-operative bleeding, post-operative infection, intra-operative cardiopulmonary bypass time, pre-discharge echocardiogram and 30 day mortality.
- Methods:** From Jan 2007 to Dec 2011, 71 patients who underwent open heart surgery were included in this study; 40 patients (56.3%) underwent mini-thoracotomy, 31 patients (43.7%) underwent median sternotomy. From the total of 71 patients, 19 were ASD repairs (26.8%), 30 MV repairs (42.3%), 10 MVRs (14.1%), 9 AVRs (12.7%), 2 DVRs (2.8%), 1 Myxoma excision (1.4%). Post-operative pain was assessed using the visual analogue pain scale given to patients on post operation day 4 or 5, and on the day of discharge. Length of hospital stay, ICU stay, post-operative bleeding and infection, and 30 day mortality were documented and analyzed.
- Results:** Patients with mini-thoracotomy had lower pain levels both on day 4 or 5 and on discharge. The mean pain score on day 4 or 5 was 2.3 and 3.9 ($p < 0.05$) respectively for mini-thoracotomy and median sternotomy. The mean pain score on discharge was 1.4 and 2.4 ($p < 0.05$). The mini-thoracotomy group also tended to have a shorter ICU stay post-operatively. There were no significant differences between the 2 groups in hospital stay, bypass time, wound infection, post-operative bleeding, pre-discharge echocardiogram and 30 day mortality.
- Conclusions:** Minimally invasive cardiac surgery appear to have no significant difference to conventional cardiac surgery in terms of quality of surgery, post-operative complications and mortality; while offering advantages of lower post-operative pain and shorter ICU stay. As the trend of increasing minimally invasive cardiac surgery continues, we look forward to further studies with larger population sizes showing advantages of minimally invasive cardiac surgery in further areas.
- 29. Surgical repair of Post-infarction Ventricular Septal Defect: Factors affecting Long-term Survival**
N. Yam¹, W.K. Au¹
¹Division of Cardiothoracic Surgery, Department of Surgery, University of Hong Kong, Queen Mary Hospital, Hong Kong
- Purpose:** Post-infarction ventricular septal defects require surgical repair to close the acute left-to-right shunt for patient salvage but long-term survival after surgery is not well established. The study was designed to investigate the current outcomes after surgery and determinants affecting long-term survival.
- Methods:** Between January 1995 to January 2012, 42 post-infarction ventricular septal defects were operated on at our division in Queen Mary Hospital (formerly in The Gratham Hospital) in 40 patients (16 males, 24 females) of ages 56 to 80 years (median 69 years). Long-term follow-up in all survived patients were investigated by univariate and multivariate analyses (Follow-up duration, mean +/- standard deviation, 5.2 +/- 5.3 years, longest follow-up 16.8 years).
- Results:** 30-days mortality for post-infarction ventricular septal defects in our cardiac surgery centre is 20% ($n = 8$). Overall survival at 1 year, 5 years and 10 years were 68%, 55% and 42% respectively. Event-free survival from subsequent angina, myocardial infarction, congestive heart failure or percutaneous interventions at 1 years, 5 years and 10 years were 66%, 43% and 25% respectively. Surgery on later half of the study period has higher survival (41.6% versus 59.2%). Operations performed immediately after transferral (i.e. emergency) has similar outcome to those performed in urgent basis (next morning operating list). Operations performed semi-urgently after medical optimization carries best results. Performing concomitant coronary artery bypass graft surgery has no additional advantage over repair of post-infarction ventricular septal defects alone in terms of overall and cardiac-event free survival.
- Conclusion:** Surgical repair of post-infarction ventricular septal defects has satisfactory results. Repair of ventricular septal defects alone with /without concomitant coronary bypass grafting did not influence long-term outcome

ABSTRACTS

Abstracts for Free Paper Session:

30.

A Novel Variation of *PLAGL1* in Chinese Population with Isolated Ventricular Septal Defect

Xiao-Yan Bai¹, Chao Xuan¹, Bin-Bin Wang², Ge Gao¹, Qin Yang^{1,3}, Xiao-Cheng Liu¹, Xu Ma² & Guo-Wei He^{1,4}

¹TEDA International Cardiovascular Hospital, Medical College, Nankai University, Tianjin, PR China

²National Research Institute for Family Planning, Beijing, PR China

³The Chinese University of Hong Kong, Hong Kong, PR China; ⁴Department of Surgery, Oregon Health and Science University, Portland, Oregon, U.S.A.

Purpose: Ventricular septal defect is the most common congenital heart disease. A number of genetic studies have linked the gene of *PLAGL1* to the etiology of congenital heart disease. The present study aimed to identify potential pathogenic mutations for *PLAGL1* and to provide insights into the etiology of isolated ventricular septal defect.

Methods: Case-control mutational analysis was performed in 300 patients with isolated ventricular septal defect and 300 healthy controls. Two protein-coding exons of *PLAGL1* and their partial flanking intron sequences were amplified by polymerase chain reaction and sequenced on an ABI3730 Automated Sequencer. CLC workbench software was used to compare the conservatism of *PLAGL1* protein with other multiple species.

Results: Neither missense nor frame-shift mutations were detected in two protein-coding exons of *PLAGL1*. But a novel synonymous variation (c. A486G, p. E162E) was detected in protein-coding exon 2. The glutamic acid which translated with the mutational codon is conservative when compared with other species.

Conclusions: We detected a synonymous variation in the protein-coding exon 2 of *PLAGL1* in isolated ventricular septal defect patients. It is possible that the etiology of isolated ventricular septal defect might not be directly linked with this mutation, but might associated with other patterns of gene expression regulation in *PLAGL1*, such as in the methylation-dependent manner.

ABSTRACTS

Abstracts for Free Paper Session:

VALVULAR HEART DISEASE & MISCELLANEOUS

- 31. Transcatheter Aortic Valve Implantation (TAVI) – Initial Experience in Hong Kong & Intermediate-term follow-up**
 Michael KY Lee¹, LK Chan¹, KC Chan¹, CY Wong¹, KT Chan¹, CB Lam¹, C Leung¹, MC Chan¹, MY Fan¹, KW Leung¹, HL Cheung², CC Ma², E So³, D Fok³, YF Chow³, MK Chan⁴, W Chan⁴, S Chan⁴, SF Yip⁴, A Cheung⁴, CS Chiang¹
¹Dept of Medicine ²Dept of Cardiothoracic Surgery ³Dept of Anaesthesiology ⁴Dept of Radiology & Imaging, Queen Elizabeth Hospital
- Introduction:** In the ageing population, aortic stenosis (AS) is the most common valvular heart disease, with a prevalence of 4.6% in adults >75 years of age. When patients with severe AS presented with the triad symptoms of congestive heart failure, syncope or chest pain, the average survival is only 2-3 years with high risk of sudden death. Surgical aortic valve replacement (SAVR) is the standard treatment but many symptomatic AS patients do not receive SAVR because of underlying co-morbidities or deemed inoperable by the surgeons. Transcatheter Aortic Valve Implantation (TAVI) has recently provided another treatment option for these patients.
- Methods:** A TAVI team comprising cardiologists, cardiac surgeons, anaesthesiologists, cardiac radiologists and cardiac nurses, was formed in early 2010 in Queen Elizabeth Hospital. All potential patients would be interviewed independently by the cardiologists and cardiac surgeons. The Heart Team then decided whether the patient was too high-risk to undergo SAVR and suitable for TAVI. All patients were assessed by echocardiogram, TEE, CT scan and angiogram to decide on suitability. Echocardiogram and 6-minute walk test would be performed according to protocol. All complications would be reported to an independent Safety Monitoring Committee.
- Results:** From December 2010 to February 2012, 13 patients (7 males and 6 females) with symptomatic severe aortic stenosis underwent the TAVI procedure. Average age 80.6±2.8 years. All procedures were done under general anaesthesia in our cardiac catheterization laboratory. All patients had their femoral arteries closed with Prostar or Proglide except the subclavian approach patient. Aortic valve area improved from 0.73±0.19cm² to 1.97±0.26cm² and mean gradient decreased from 53.9±12.3mmHg to 9.7±3.6mmHg. All patients have only trivial to mild aortic regurgitation during subsequent follow-up. All of them became asymptomatic on follow-up with an improvement of NYHA Functional Class 1.25. Permanent pacemakers were implanted in 2 patients (15.4%). 1 patient was noticed to have subclavian artery subtotal occlusion after surgical repair with successful stenting done. No other complications were noted. The in-hospital and 30-day mortality was 0%.
- Conclusions:** TAVI has developed at an escalating pace with rapid adoption world-wide and it is a feasible alternative for elderly symptomatic AS patients who are deemed inoperable or high-risk for open heart surgery. We have shown very promising intermediate-term outcome results in Hong Kong. This involves multi-disciplinary team collaboration and meticulous procedural details to achieve the optimal results. Long-term outcomes should be diligently monitored.
- 32. Candida Infective Endocarditis: Report of 22 Cases From a Prospective Single-center Study**
 X.L. Sun¹, G.G. Wang¹, J. Zhang¹
¹Fuwai Hospital, National Center for Cardiovascular Disease, Peking Union Medical College and Chinese Academy of Medical Science, Beijing, China
- Purpose:** Fungal infective endocarditis is a rare and poorly understood complication of fungemia. Most epidemiologic data are derived from case reports. This study was conducted to explore the clinical characteristics, treatment patterns, and outcomes of patients with Fungal IE.
- Methods:** We conducted a prospective, observational study in the Fuwai Hospital, National Center for Cardiovascular disease, including all consecutive patients with a definite diagnosis of IE admitted from January 2002 through December 2011. The overall characteristics and risk factors for death from CE were analysed.
- Result:** The mean age at presentation was 32 ± 6 years, with a slight male preponderance. Fourteen of 22 cases (64%) occurred within 1 year of prosthetic valve placement, 6 cases (27%) of native valve endocarditis (NVE), 2 cases of pacemaker endocarditis. None of them were intravenous drug users. Most patients (82%) had healthcare-associated IE. The aortic valve was most commonly affected, and the most common aetiological agent was *Candida* species, followed by *Histoplasma capsulatum*. Persistent infection (75%), major vessel embolism (61%), and anemia (44%) were the most frequently manifestations. Major complications occurring during the acute infective phase were also recorded, including renal dysfunction (75%), such as renal infarction, heart failure (44%), and neurological complication (38%). Eight patients (36%) underwent valve replacement. Pathological evaluation of valve material was of high yield, with organisms identified in 87% of cases who underwent valve replacement surgery. The overall hospital mortality rate was 66.7%. Mortality was higher in patients with PVE (9 of 14 cases, 64.3%) than in patients with NVE (2 of 6 patients, 33.3%). A better outcome was observed in patients treated with a combined medical and surgical therapy.
- Conclusion:** Fungal infective endocarditis is associated with a high mortality despite diagnostic and therapeutic improvements. Early diagnosis and transesophageal echocardiography may be essential for fungal infective endocarditis.
- 33. A multidisciplinary approach to improve patient outcome for non-cardiac surgery – cardiologists' perspective**
 Yip W.C.¹, B. Yan¹, Man S.Y.¹, Kong C.M.¹, Kwong N.P.¹, Hau W.Y.¹, Tam K.M.¹, Wai Y.L.², Ma K.H.³, Kwan W.K.¹
¹Department of Medicine, ²Orthopaedic Surgery, ³ENT Surgery of Yan Chai Hospital & Cardiology, Prince of Wales Hospital ⁴Chinese University of HK
- Introduction:** Elderly patients with multiple co-morbid diseases are prone to suffer from cardiovascular diseases and peri-operative complications arise with poor surgical outcomes.
- Objectives:** 1. To share the experience of a multidisciplinary approach in patient care. 2. To enhance awareness of new option in cardiovascular interventions for pre-operative care of non-cardiac surgery
- Methodology:** 3 patients suffered from cardiovascular diseases who were admitted into Yan Chai Hospital between 2010 and 2012 are reviewed. Their pre-operative risks were assessed and outcomes were documented.
- Results: Patient 1** – Mdm. Lam, 70 years old, had history of DM & L. BKA in 2007. She was admitted for R foot gangrene in Aug. 2010. Peripheral revascularization was performed at PWH for R Superficial Femoral Artery 90% long lesion & R Anterior Tibial Artery total occlusion. Patient subsequently had ray amputation (foot preservation) in Sept. 2010 but re-angioplasty with drug eluting balloon was required and performed for wound healing again in Dec. 2010. She is now able to walk unaided with L. leg prosthesis. **Patient 2** – Mr. Chow, 66 years old, had history of COPD & NSTEMI/APO in 2010 when he was advised medical treatment at another hospital. He was diagnosed to have ca larynx for emergency tracheostomy in Aug. 2011 and urgent c.c. & PCI suggested prior to tracheostomy for LM/LAD & RCA. Both PCI and tracheostomy were uneventful within the same week. (clopidogrel omitted once for tracheostomy). Despite successful radiotherapy and closure of tracheostomy, he died of brain & lung metastases in late Mar. 2012. **Patient 3** – Mdm. Tsang, 83 years old, had history of hypertension and recent GIB requiring placation of bleeder in Oct, 2011. It was complicating with NSTEMI and medical treatment was advised. She was admitted for R hip fracture in Jan. 2012. High risk orthopedic surgery was strongly advocated by both patient and surgeons. After thorough discussion for the surgical risk, PCI was performed for LAD and patient has early hip surgery performed as requested by patient & relatives. She is having ambulatory exercise at rehabilitation facility.
- Conclusion:** Strategic planning and collaboration among different specialists help in improving patient outcome for non-cardiac surgery.
- 34. Activation and Recoupling of eNOS Underlie the Effect of AVE3085: Endothelial Protection Against Asymmetric Dimethylarginine**
 Q Yang¹, H.M. Xue¹, M.J. Underwood², C.M. Yu¹
¹Division of Cardiology, Department of Medicine and Therapeutics ²Division of Cardiothoracic Surgery, Department of Surgery, Prince of Wales Hospital, The Chinese University of Hong Kong, Hong Kong
- Purpose:** Asymmetric dimethylarginine (ADMA) is an endogenous inhibitor of eNOS and is recognized as a risk factor for endothelial dysfunction in cardiovascular diseases. We investigated the effect of AVE3085, a newly developed transcription enhancer of eNOS, on ADMA-induced endothelial dysfunction in coronary arteries with underlying mechanisms explored.
- Methods:** Porcine coronary small arteries (diameter 600-800 μm) were studied in a myograph for endothelium-dependent relaxation to bradykinin and endothelium-independent relaxation to sodium nitroprusside. Protein expressions of eNOS, phosphorylated-eNOS (p-eNOS^{Ser1177} and p-eNOS^{Thr495}), and nitrotyrosine were determined by Western blot. NO release was directly measured with a NO microsensor and O₂⁻ production was determined by lucigenin-enhanced chemiluminescence.
- Results:** Exposure to ADMA significantly decreased the bradykinin-induced vasorelaxation and reduced the protein expression of p-eNOS^{Ser1177} whereas increased the expression of p-eNOS^{Thr495} and nitrotyrosine. Pre-incubation with AVE3085 restored the bradykinin-induced relaxation, reversed the decrease of p-eNOS^{Ser1177}, and lowered the level of p-eNOS^{Thr495} and nitrotyrosine. NO release in response to bradykinin was significantly reduced by ADMA and such reduction was restored by AVE3085. AVE3085 also prevented the elevation of O₂⁻ level in coronary arteries exposed to ADMA.
- Conclusions:** AVE3085 prevents ADMA-induced endothelial dysfunction in coronary arteries. The protective effect of AVE3085 may be attributed to increased NO production resulting from enhanced eNOS activation, and decreased oxidative stress that involves inhibition of O₂⁻ generation by eNOS recoupling. The present study suggested the therapeutic potential of AVE3085 in endothelial dysfunction in cardiovascular disorders.
- Acknowledgements:** This study was supported by Hong Kong RGC grant (GRF4789/09M) and CUHK Direct grant 2041688.

ABSTRACTS

Abstracts for Free Paper Session:

35.

The Impact of Propofol-Dezocine Combination Anesthetic for Painless Induced Abortion on Cardiovascular System

Fu Hong¹, Hu Yan Jun², Woo Kam Sang³, Wei An-ning⁴

¹The First Hospital of Chongqing Department of Anesthesiology, Zhongyi Hospital of Chongqing

²The Ninth Affiliated Hospital of Chongqing

³The Chinese University of Hong Kong

⁴The Second Affiliated Hospital, Chongqing University of Medical Sciences, Chongqing, China

Introduction: Induced abortion is practiced frequently in China for medical and other indications. Intravenous propofol and dezocine are potent anesthetics for surgical procedures.

Objective: To observe the impact of propofol combined with dezocine administration for painless induced abortion on hemodynamics of patients.

Patients and Methods: 116 cases of pregnant women scheduled for induced abortion were selected randomly. Their mean arterial pressure (MAP), heart rate (HR) and heart rate variability (HRV) were measured before (T0) and 5 minutes after intravenous dezocine (0.1 mg per kg) (T1), 5 minutes after intravenous propofol (2 mg per kg) (T2) and at the end of the induced abortion (T3).

Results: Their MAP, and HR at T1 were significantly higher than T0 (P<0.05). MAP, HR and HRV (low/ high frequency) at T2 were lower than those in T1 (P<0.01). All parameters recovered at T3 but were still lower than T1 (P<0.05). All hemodynamic parameters at T2 and T3 had no significant difference compared with T0 (P > 0.05). Good sedative and analgesic effects were witnessed in all patients.

Hemodynamic changes after injection of dezocine and propofol

Variables	T0	T1	T2	T3
MAP (mmHg)	88.0±14.0	112.0±18.0 [△]	79.0±17.0 ^{△△}	93.0±17.0 [△]
HR (bpm)	73.0 ±12.0	86.0±17.0 [△]	68.0±12.0 ^{△△}	72.0±14.0 [△]
LF	1005.0±395.0	1720.0±337.0 [△]	998.0±415.0 ^{△△}	1100.0±492.0 [△]
HF	524.0±316.0	573.0±297.0	493.0±385.0	506.0±313.0
LF/HF	1.9±1.1	3.0±1.2 [△]	2.0±1.1 ^{△△}	2.2±1.6 [△]

Values are the mean ± SD of 116 experiments. LF: Low frequency HF: High frequency
Compared with T0 [△]p<0.01; compared with T1 [△]p < 0.05, ^{△△}p < 0.01

Conclusion: Propofol combined with dezocine in induced abortion is relatively safe, with no significant impact on hemodynamics, but good sedative and analgesic effects.

ABSTRACTS

Abstracts for Free Paper Session:

PAEDIATRIC CARDIOLOGY (I)

- 36. Iron Overload Induces Mitochondria-Dependent Apoptosis and Calpain-Dependent Titin Proteolysis of Cardiomyocytes**
 Meipian Chen¹, Godfrey C. F. Chan¹, Yiu-fai Cheung¹
¹Department of Paediatrics and Adolescent Medicine, LKS Faculty of Medicine, The University of Hong Kong
- Background & Objectives:** Cardiomyopathy secondary to iron overload is well documented in patients with beta-thalassaemia major. Nonetheless, the underlying mechanisms of iron entry into cardiomyocytes and the subsequent detrimental effects on cardiac function remain to be defined. We hypothesized that iron overload contributes to cardiac dysfunction by inducing apoptosis via mitochondria-dependent pathway, and alters the properties of the giant myofibrillar protein titin.
- Materials & Methods:** Iron-overloaded HL-1 cardiomyocytes, derived from a spontaneously contracting mouse atrial cell line, were used for *in vitro* studies; iron-overloaded B6D2F1 mice were used for *in vivo* studies. Using fluorescent probes, iron was visualized dynamically and quantitatively in living HL-1 cardiomyocytes by fluorescence microscopy and quantitative fluorimetry. Using flow cytometry, phosphatidylserine exposure, active caspase-3 expression and mitochondrial membrane potential were determined in Iron-overloaded HL-1 cardiomyocytes. Immunostaining and gel electrophoresis of titin were examined in the heart tissues of Iron-overloaded mice. Activation of the upstream calcium-dependent protease of titin, calpain, was detected by FRET substrate cleavage using quantitative fluorimetry.
- Results:** We demonstrated the uptake of labile iron from culture medium to HL-1 cardiomyocytes. With intracellular accumulation of iron, HL-1 cells showed dose-dependent loss of membrane integrity, dose-dependent increase of caspase-3 activity and dose-dependent drop in mitochondrial membrane potential. In the cardiac tissue of Iron-overloaded mice, calpain activity increased significantly and titin disarray and degradation were also observed.
- Conclusion:** Our findings suggest that iron overloading, through activation of calpain, causes titin proteolysis, and induces mitochondria-mediated caspase-3 dependent apoptosis in cardiomyocytes, which results in cardiac dysfunction.
- 37. The Central Role of Transcription Factor Islet-1 in the Gene Regulatory Network of Histone Acetylation During Embryonic Heart Development**
 Kong Juanjuan¹, Chen guozhen¹, Sun huichao¹, TianJie¹
¹Dept. of Cardiology; Chongqing Medical University of Children's Hospital, Chongqing, P.R. China
- Objective:** To investigate the temporal expression of transcription factor Islet-1 and the central role of transcription factor Islet-1 in the gene regulatory network during the embryonic heart development.
- Methods:** The whole hearts from newborn mice and embryonic mice on embryonic days 11.5 (E11.5), E14.5, and E17.5 were collected respectively. The temporal expression of the transcription factor Islet1 was quantitative detected by Western-blot method. The transcription factor Islet-1 was determined using p300 primary antibody with co-immunoprecipitation (Co-IP) and subsequent mass spectrum (MS) analysis, meanwhile the relationship between Islet-1 and histone acetyltransferase p300 was negative verified by Western-blot assay. Cardiac-specific genes, such as GATA4, Mef2c and Tbx5 that physically interacted with Islet-1 protein, were analyzed using chromatin immunoprecipitation (ChIP) assays and Q-PCR.
- Results:** (1) The data from Western-blot assay revealed that the expression of the transcription factor Islet-1 reached a peak on day E14.5, and then was gradually decreased afterward during embryonic heart development. The expression of transcription factor Islet-1 was significantly higher in the group on E14.5 (0.434±0.353) than other groups on E11.5 (0.074±0.456), E17.5 (0.120±0.127) and newborn mice (0.049±0.083) (p<0.05), but there was no significant difference among E11.5, E17.5 and newborn mice (p>0.05). (2) Results from Co-IP, MS and Western-blot assays showed that the transcription factor Islet-1 could combine with histone acetyltransferase p300 to form complex protein during the embryonic heart development. (3) Results from ChIP assay showed that Islet-1 protein physically combined with the promoter region of cardiac-specific genes (GATA4, Mef2c and Tbx5).
- Conclusion:** Islet-1, as a central role, may recruit histone acetyltransferase p300 and combine with the promoter region of cardiac-specific genes (GATA4, Mef2c and Tbx5) during the embryonic heart development.
- 38. BMP2 increase the expression of cardiac transcription factors via up-regulating histone H3 acetylation in H9C2 cells**
 Min Zheng¹, Jie Tian¹
¹Children's Hospital of Chongqing Medical University, Chongqing, P.R. China
- Objective:** During the induction of cardiac myogenesis, BMP2 elicits expression of cardiac transcription factors such as Nkx2.5 and Gata4, but the underlying mechanisms are not clear. Our previous study suggests that histone acetylation play an important role in the regulation of gene expression during heart development. The regulation of histone acetylation may be a mechanism by which BMP2 increase the cardiac transcription factors expression. The goal of current study is to investigate the effect of BMP2 on cardiac transcription factors (GATA4, MEF2C) and histone H3 acetylation in H9C2 cells.
- Material and Method:** The cultured rat H9C2 embryonic cardiac myocytes were transfected with pAdEasy-BMP2 adenovirus (AdBMP2). Transfection efficiency was measured by flow cytometry, the mRNA expression level of BMP2, GATA4, MEF2C, p300 and smad4 were assessed by quantitative real-time RT-PCR. The histone H3 acetylation level in the promoter regions of GATA4, MEF2C were assessed by ChIP. Histone H3 acetylation level and the smad4 protein content in nucleus were assessed by Western Blotting.
- Results:**
1. Twenty four hours after transfected with AdBMP2, the transfection efficiency were more than 90% and the expression of BMP2 were improved significantly.
 2. Forty eight hours after transfection, the acetylation of histone H3 in nucleus and in the promoter regions of cardiac transcription factors GATA4 and MEF2C was up-regulated. Accordingly, the expression of these genes were significantly increased.
 3. BMP2 also increased the mRNA expression level of p300 and smad4, and the smad4 protein content in nucleus.
- Conclusion:** Taken together, the increase of cardiac transcription factors GATA4 and MEF2C expression by BMP2 partly via up-regulating the histone H3 acetylation level associated with those gene promoter region. The histone acetylases subtype p300 and smad4 signaling pathway may take part in the BMP2 induced histone hyperacetylation.
- Keywords:** BMP2; histone acetylation; p300; smad4; cardiac transcription factors
- 39. ISLET-1 Assist Histone Acetylation to Regulate Cardiac Development-Related Transcription Factors**
 Zhongsu Yu¹, Jie Tian¹
¹Children's Hospital of Chongqing Medical University, Chongqing, P.R. China
- Objective:** Histone acetylation is a important epigenetic method. Our previous studies showed that cardiac development-related transcription factors were regulated by histone acetylation. Histone acetylation level depends on histone acetyltransferases (HATs) and histone deacetylase (HDACs). However, HATs have no DNA binding domain. They need a assistant factors to combine with DNA. The LIM-Homeodomain transcription factors Islet-1 is a important transcription factors during cardiac development. It may be the assistant factors. This study investigated whether Islet-1 assisted histone acetylation to regulate the expression of cardiac development-related transcription factors via a cardiac progenitor cell model which was transfected lentivirus with a Islet-1 RNAi vector.
- Material and Method:** Cardiac progenitor cells that were transfected with lentivirus vectors to inhibit Islet-1 expression served as RNAi group. The cardiac progenitor cells that were transfected with empty vectors served as negative control. Transfection efficiency was measured by flow cytometry. The expression of cardiac development-related transcription factors were measured using Q-PCR. Histone acetylation level was detected by western blotting. Cardiac development-related transcription factors that physically interacted with acetylated histone H3 in cardiac progenitor cells were analyzed using ChIP assays. Cardiac development-related transcription factors that physically interacted with p300 in cardiac progenitor cells were analyzed using ChIP assays.
- Results** 1. Flow cytometry showed that transfection efficiency of negative control and RNAi group were both more than 30%. Q-PCR result showed that the expression of Islet-1, Mef2c and Tbx5 at RNAi group were less than blank control and negative control (p<0.05). However, there are no significant difference of the expression of Gata4 at RNAi group compared to control groups (p>0.05). 2. Western blotting showed that there were no significant difference of histone H3 acetylation level at RNAi group compared to control groups (p>0.05). ChIP-PCR assays revealed that histone H3 acetylation level of Mef2c promoter at RNAi group was less than control groups (p<0.05), and there were no significant difference of histone H3 acetylation level of Gata4 promoter and Tbx5 promoter. Meanwhile, binding level of p300 to Mef2c promoter at RNAi group was less than control groups (p<0.05). There were no significant difference of binding level of p300 to Gata4 promoter and Tbx5 promoter.
- Conclusion:** These data indicated that Islet-1 can assist p300 to combine with Mef2c promoter, and increase histone H3 acetylation level of Mef2c promoter to activate expression of Mef2c. However, histone acetylation may regulate expression of Gata4 and Tbx5 through other method.
- Keywords** Islet-1; histone acetylation; transcription factors; cardiac progenitor cell; cardiac development

ABSTRACTS

Abstracts for Free Paper Session:

40.

Resting Heart Rate is associated with Blood Pressure, Adiposity and Intensity of Exercises in Children

S.Y Kwok¹, H.K So¹, A.F.C. Lo¹, R.Y.T. Sung¹

¹Department of Paediatrics, The Chinese University of Hong Kong, Prince of Wales Hospital, Shatin, Hong Kong

Background: Resting heart rate (RHR) is a readily measurable triage parameter in acute paediatric medicine. In adults, there is a correlation between increased RHR and cardiovascular risk and accumulating evidences showed this may also be true in children. The purpose of this study was to analyze the association between RHR, blood pressure (BP) and adiposity in children, and whether lifestyle modification could help in reducing RHR.

Methods: Data analyzed in this study was obtained from a territory-wide growth study carried out in 2005-2006. Students were randomly selected from each of the 18 districts of Hong Kong and had their RHR and BP measured by a validated oscillometric BP device. Their anthropometric data were recorded. Students who were grade 4 or above were further asked to report their frequencies of participation in structured exercise programs. The percentiles of RHR by age and gender using LMS method were generated. Analysis of Variance (ANOVA), Pearson Chi-square test and multiple linear regression analysis were used to test associations between RHR and BP, anthropometry and exercise frequency. Structural equation modeling (SEM) technique was used to further test the association between obesity and RHR.

Results: A total of 14842 Chinese school children aged 6-18 years were included. Sex specific reference values and percentile curves for RHR were attained. Higher RHR were found in girls, and groups of young or obese children. With multiple linear regression analysis, there was a significant association between high RHR and elevated BP in children, which were independent of adiposity. ($p < 0.001$) On the other hand, RHR had a negative association with age. ($p < 0.001$) An inverse relationship between RHR and exercise frequency was observed, and RHR was substantially decreased with increased training frequency. ($p < 0.001$). There was a weak positive association between RHR and obesity. ($p < 0.001$ for boys; $p = 0.002$ for girls)

Conclusions: Elevated RHR has a clear and independent link to elevated BP and high adiposity. Structured physical training activity has a beneficial effect on RHR

ABSTRACTS

Abstracts for Free Paper Session:

PAEDIATRIC CARDIOLOGY (II)

- 41. Nonfluoroscopic Approach for Cryoablation of Atrioventricular Junctional Reentry Tachycardia in Children and Young Adults Using a Three-Dimensional Navigation System**
T.C. Yung¹, K.S. Lun¹, K.T. Wong¹, P.C. Chow¹
¹Department of Paediatric Cardiology, Queen Mary Hospital, Hong Kong, China
- Background & Objectives:** Three-dimensional mapping allows continuous visualization of the locations of electrode catheters, and has the potential to decrease fluoroscopy times. The aim of this study was to assess the impact of the new mapping system on the fluoroscopy use during cryoablation of atrioventricular junctional reentry tachycardia (AVJRT) in children and young adults.
- Methods:** From February 2010 to November 2011, 28 patients (age: 14.2±4.0 years) with AVJRT underwent transcatheter cryoablation, with catheter navigation and mapping guided by the EnSite NavX system (St. Jude Medical, USA)(NavX group). Fluoroscopy times and procedure times were compared retrospectively to 18 cryoablation cases (age: 15.7± 3.2 years) for AVJRT using fluoroscopy only(control group).
- Results:** Mean procedure time was similar in both groups (NavX 174.2±38.5 minutes vs control 172.3±47.6 minutes). Mean fluoroscopy time in the NavX group was 8.2 ± 10.8 minutes (range 0- 44.5), which is significantly reduced when compared to the control (30.7±13.3 minutes) (p< 0.05). In the NavX group fluoroscopy time in the last 7 cases was less than one minute. Three procedures did not require fluoroscopy and one procedure recorded only 2 seconds of fluoroscopy. Procedural success was achieved in 27 (96%) cases of the NavX group and 100% in the control group.
- Conclusion:** Three-dimensional mapping by the Ensite NavX system effectively decreased fluoroscopy use during transcatheter cryoablation for AVJRT in children and young adults.
- 42. Pulmonary Artery sling: a Rare Cause of Respiratory Distress in Infants and Children**
J. Hou¹, F. Liu¹, L. Wu¹, Y.H. Gui¹, Q.L. Shen¹
¹Children's Hospital of Fudan University, Shanghai, China
- Background:** Pulmonary artery sling (PAS), a rare congenital cardiac anomaly, may cause non-specific respiratory distress in infants and children, and lead to be misdiagnosed. The aim of this report was to clarify the clinical and imaging features of this entity and emphasize the role of imaging in defining the anatomy and important associated anomalies.
- Methods:** Twelve consecutive patients (6 boys and 6 girls, aged from 15 days to 82 months) were diagnosed as PAS in our hospital from January 2003 to September 2011. Their symptoms, diagnostic findings, treatments, and outcomes were retrospectively reviewed.
- Results:** Eleven patients (92%) had respiratory distress, with the age at onset from 1 day to 24 months. Echocardiography failed to diagnose PAS in 3 patients. Eight patients (67%) had associated cardiac malformations, including persistent left superior vena cava(3), left patent ductus arteriosus(3), right pulmonary artery stenosis(3), ventricular septal defect(2), atrial septal defect (2), coarctation of the aorta (1), and tetralogy of Fallot (1). Ten patients who had multidetector CT (MDCT) were all diagnosed as PAS and were classified as type IA PAS in 2 cases, type IIA in 3 cases and type IIB in 5 cases and all these 10 patients were diagnosed as various degree tracheal bronchus stenosis. Cardiac catheterization and angiography in 4 patients with complex cardiac malformations showed cardiovascular anatomy as well as PAS. Six patients had surgical repair of PAS and associated cardiac anomalies. One patient died shortly after surgery. Two patients without surgical repair died of severe respiratory infection during follow-up in their first year.
- Conclusion:** Patients with recurrent stridor and wheeze should be examined for the possible presence of PAS. Echocardiography is helpful for the diagnosis of PAS and associated cardiac anomalies. MDCT with 3-dimensional reconstruction can clearly demonstrate the anatomy of pulmonary artery and trachea stenosis, and is valuable in the classification and therapeutic consideration. Except for complex cardiovascular malformations, cardiac catheterization is unnecessary for PAS patients.
- 43. Experimental study on preparation and characteristics of HSA modified paclitaxel-carrying nanometre microbubbles**
R. Yang¹, X. Ji¹, J. Tian¹
¹Department of Cardiology, Children's Hospital of Chongqing Medical University
- Purpose:** To prepare paclitaxel-carrying nanometre microbubbles(PNM) modified with human serum albumin(HSA) and study the Characteristics.
- Methods:** The HSA modified PNM was prepared by thin-film dispersion method and mechanical vibration, the appearance,concentration,mean diameter,zeta potential and the entrapment efficiency were detected. The normalrabbit's iliac artery contrast imaging was observed.
- Results:** This modified PNM had a good shape.The mean diameter was(772.9±6.2)nm, the concentration of bubble was (8.64±1.38)×10 /ml, zeta potential was(-13.2±0.3)mv, the entrapment efficiency of the modified bubble was (93.51±2.07)%,which washigher than that of no modified bubble (84.88±4.14%)(P<0.05).It could make the rabbit iliac artery enhancement.
- Conclusions:** The HSA modified PNM was stable and effective, with smaller sizeand higher encapsulation efficiency.
- 44. Paclitaxel-Carrying Liposome Microbubbles Combining with Low-Frequency Focal Ultrasound Inhibits Neointimal Hyperplasia in a Rabbit Iliac Balloon Injury Model**
J. Guo¹, X.J. Ji¹, G.S. Yu¹, et al
¹Department of Cardiology, The Children's Hospital of Chongqing Medical University, Chong Qing, P.R. China
- Objective:** To evaluate the effect of paclitaxel-carrying liposome microbubbles (PLM) combining with low-frequency ultrasound on vascular reconstruction, a rabbit iliac balloon injury model was used.
- Methods:** 25 young New Zealand White rabbits were subjected to iliac balloon injury for induction of iliac stenosis. 3 weeks after surgery, animals were randomly divided into 5 groups and underwent treatment for 7 days as: Group A: PLM plus low-frequency ultrasound (PLM+US), Group B: liposome microbubbles plus low-frequency ultrasound (LM+US), Group C: PTX plus low-frequency ultrasound (PTX+US), Group D: low-frequency ultrasound only (US) and Group E: no treatment control group (BC). The low-frequency ultrasound focally targeted the injured iliac arteries. Animals were sacrificed 7 days after treatment for histological and pathological analysis.
- Results:** The vascular structures reconstruction with the elastic fiber hyperplasia in the lining layer was observed obviously after 3 weeks of the surgery. The intima area and the tunica media area were the largest in group E (P<0.05) .The lumen area was largest but the intima area and the tunica media area were the lowest in group A (P=0.000) . The ratio of the intima area and tunica media area were reduced after the intervention (P<0.05) , especially in group A (P=0.000) .In group A , the positive cells was significantly Less than the other intervention groups (P<0.05) .
- Conclusion:** Paclitaxel-carrying liposome microbubbles combining with low-frequency focal ultrasound significantly inhibits neointimal hyperplasia. Paclitaxel-carrying liposome microbubbles combining with low-frequency focal ultrasound may represent a novel therapeutic method for treating restenosis.

ABSTRACTS

Abstracts for Free Paper Session:

- 45. Establishment of Pulmonary Hypertension and Right Ventricular Dysfunction Model in the Beagle Induced by Dehydromonocrotaline**
 J. Lam¹
¹Department of Pediatric Cardiology, the First Affiliated Hospital, Sun Yat-sen University, China
- Purpose:** To explore the way and technique to establish pulmonary hypertension and right ventricular dysfunction model in the beagle using dehydromonocrotaline.
Methods: Fifteen beagle dogs were randomly divided into three groups, the control group (n=5) the peripheral vein injecting group (the PV group) (n=4) and the right ventricle injecting group (the RV group) (n=6). Monocrotaline was transformed into dehydromonocrotaline in vitro. After the hemodynamic data including the mPAP, PVR, CO were obtained, the PV group were injected dehydromonocrotaline 2.5y3.5mg/kg dissolved in dimethylformamide (0.1ml/kg) via veins of right upper extremity, the RV group were injected dehydromonocrotaline 3.5y4.0mg/kg dissolved in dimethylformamide (0.1ml/kg) via right ventricle. Hemodynamic measure was repeated after six weeks and pathological autopsy was performed after the beagle died.
Results: 1 The dehydromonocrotaline was extremely unstable and sensitive to water and temperature. 2 Four beagle of the PV group and three of six beagle of the RV group survived after six weeks. Two dogs injected dehydromonocrotaline 2.5mg/kg via the peripheral vein way failed to set up pulmonary hypertension and right ventricle dysfunction model. Two dogs injected dehydromonocrotaline 4.0mg/kg via the right ventricle way died of pulmonary edema within 48 hours and one dog injected dehydromonocrotaline 3.5mg/kg died on the 32th day after injection. All the other beagles alive were successful to establish pulmonary hypertension and right ventricular dysfunction. The mPAPyPVR were significantly increased in the dehydromonocrotaline injection groups. And the changes in control group did not show statistical significance. 3 Hypertrophy and proliferation of pulmonary vascular smooth muscle, narrowing of the lumens and infiltration of inflammatory cells were observed under light microscope in the dehydromonocrotaline injecting groups.
Conclusion: 1 The dehydromonocrotaline was extremely unstable and should be injected as soon as possible after transformation from monocrotaline in vitro. 2 It was successful to establish pulmonary hypertension and right ventricular dysfunction model in the beagle via the peripheral vein or the right ventricle way using dehydromonocrotaline. 3 The effective dose and lethal dose of dehydromonocrotaline was very close and it was easily to cause death when applying above the dose of 3.5mg/kg
- 46. The use of covered Cheatham-Platinum stent for native coarctation of the aorta in children: A report of two cases**
 Y. Li¹
¹Department of Pediatric Cardiology, The first affiliated hospital, Sun Yat-Sen University, Guangzhou 510000, China
- Purpose:** To evaluate the short-term effect of covered Cheatham-Platinum (CP) stent implantation in children with native coarctation of the aorta (CoA).
Methods: From July to December 2010, 2 male patients with native CoA underwent covered CP stent implantations in our institute. The covered CP stents were delivered to the CoA site through the balloon catheters, both of which were selected according to the data of aortogram, using a retrograde femoral artery approach. Inflated the BIB balloon to expand the stent when the blood pressure dropped by 50% under rapid right ventricular pacing.
Results: The patient age and weight were 11 year, 23.8kg and 15 years, 42 kg, respectively. The tran-coarctation pressure gradient before stenting were 63mmHg and 57mmHg respectively according to the echocardiogram. 2 cases were both immediate successful. A Numed covered CP stent (8Zig x 3.4cm) was implanted in either of the patient, through a 12F sheath and 9F BIB balloon (with an outer balloon of 16mm x 4.0cm). The peak systolic pressure gradient across the CoA site decreased from 72mmHg, 26mmHg to 2mmHg, 8mmHg and the minimum aortic diameter increased from 3mm, 4.8mm to 16mm, 15mm respectively. The patients were followed up for 14-20 months and the echocardiogram showed that the tran-coarctation pressure gradient were 20mmHg and 11mmHg respectively, without major complications including approach artery injury, stent migration, aneurysm formation and aortic dissection.
Conclusion: Covered CP stents are feasible and safe for native coarctation of the aorta in children at short-terms. Further observation and follow-up data are still needed to assess mid-term and long-term safety and efficacy. Artery injury, stent migration, aneurysm formation and aortic dissection.
Conclusion: Covered CP stents are feasible and safe for native coarctation of the aorta in children at short-terms. Further observation and follow-up data are still needed to assess mid-term and long-term safety and efficacy.
- 47. Unveiling the Genetics of Long QT Syndrome: a Local Paediatric Experience**
 A.P.Y. Lie¹, B.H.Y. Chung¹, T.C. Yung¹
¹Department of Paediatrics & Adolescent Medicine, Queen Mary Hospital, University of Hong Kong, Hong Kong
- Purpose:** Genetic testing has emerged to become an indispensable component of standard clinical management for patients with long QT syndrome (LQTS). Local data on the genetics of paediatric patients with LQTS are lacking. The current study offers insight into the underlying mutations of these probands, acts as a pilot study for the implementation of a multi-disciplinary inherited arrhythmia program.
Methods: We identified patients who were clinically diagnosed to have LQTS from 2006 to 2011 from the database of the Department of Paediatric Cardiology, Queen Mary Hospital. Relevant demographic and clinical data was retrieved. Pre-test counselling was then conducted and for patients who consented to testing, samples were sent for sequencing of 6 responsible genes (LQT1-3, 5-7) together with multiplex ligation-dependent probe amplification analysis of 5 responsible genes (LQT1-3, 5-6).
Results: 16 patients with LQTS underwent genetic testing. Nine were male (56%), the mean age at diagnosis was 10.9 years (range 0-18 years) and the mean longest corrected QT interval identified on a standard 12-lead electrocardiogram was 522ms (range 460-619ms). Syncope was the commonest initial presentation occurring in 9 individuals. Pathogenic mutations were detected in 9 patients (56%), affecting LQT1 gene in 3, LQT2 in 4, LQT3 in 1 and LQT5 in 1; 2 patients (13%) had likely pathogenic mutations, both in the LQT2 genes; 2 patients (13%) only had variants of unknown clinical significance in the genes tested and 3 (19%) had no mutation demonstrated.
Conclusions: Our study demonstrated that up to 69% of our LQTS patients have pathological, or likely pathological mutations of LQT genes. Integration of genetic assessment with in the management of LQTS is important in diagnosis, risk stratification and genotype-guided therapy.

ABSTRACTS

Abstracts for Poster Session:

P1.

Outcome of Coronary Artery Bypass Grafting in the Modern Era: A Single Institution Experience

Kwok MWT¹, Wong RHL¹, Ng CSH¹, Yeung ECL¹, Wan IYP¹, Wan S¹, Underwood MJ¹
¹Division of Cardiothoracic Surgery, Department of Surgery, Prince of Wales Hospital, Shatin

Purpose: To review surgical results of coronary artery bypass grafting in a single institution.

Methods: We prospectively studied patients underwent coronary artery bypass grafting (CABG) in Prince of Wales Hospital from 1/2006 to 06/2011. Patients' demographics, automatically generated risk scores, intra and post-operative variables were recorded. Data was prospectively collected and entered for analysis after being validated by a research assistant.

Results: In the study period, 971 patients underwent isolated CABG in our institution. Mean age was 63 years old, the mean logistic Euroscore was 3.36 and mean complex Bayes score was 3.31. There was a male predominance (81.5%) and 49.2% of patients were diabetics. Since 38.5% of patients had left main coronary artery stenosis and 30.5% patients had unstable symptoms, we had 35.4% of patients received aspirin at the time of operation. There were 175 urgent (18%) and 46 emergency operations (4.7%). There were 27.8% of patients with ejection fraction less than 50%. Cardiopulmonary bypass machine usage and arterial grafts usage were 92.8% and 95.6%, respectively. Post-operative intra-aortic balloon usage was 3.9%, ICU readmission rate was 3.4%, reoperation for bleeding rate was 1.6% and permanent stroke rate was 0.5%. The overall crude mortality rate for CABG was 1.2 %, crude mortality for elective CABG was 0.5%.

Conclusion: In modern era, CABG is associated with very low morbidities and mortalities especially when undertaken in the elective setting.

P2.

International Benchmarking of Surgical Outcomes: Globalizing Quality Assurance in Cardiac Surgery

Kwok MWT¹, Wong RHL¹, Ng CSH¹, Wan IYP¹, Wan S¹, Underwood MJ¹
¹Division of Cardiothoracic Surgery, Department of Surgery, Prince of Wales Hospital, Shatin

Purpose: Benchmarking is an important component of quality assurance programmes. The European Society for Cardiothoracic Surgery (ESCTS) Database includes data from over 29 countries in Europe, 50 hospitals from mainland China and outcomes for over 1 million cardiac procedures. This study shows the outcome benchmarking for the cardiac surgery activity from our Division (Chinese University of Hong Kong, Prince of Wales Hospital (CUHK)) with the ESCTS Database, including data from mainland China.

Method: Prospective data collection for all cardiac surgical activity within our Division was stored in a dedicated server. Data was independently and remotely extracted from this server by representatives of the ESCTS for the period 2006-8 inclusive. Benchmarking was performed independently by ESCTS for activity, data completeness and risk-adjusted outcomes (using logistic-EuroSCORE) by funnel plot construction. Mortality for all activity and index procedures (coronary artery bypass grafting (CABG), aortic valve replacement) was presented with 99% and 99.9% confidence intervals.

Results: CUHK contributed to 3.7% of overall database submissions from Asia. Data completeness for CUHK ranked number 1 for 8 assessed risk variables (total 12) (range 1-9). There were major differences between Asia, CUHK and European Regions in terms of preoperative patient characteristics and operative workloads. CUHK mortality for all activity was 2% (99% CI: 2-5), CABG 1% (99% CI: 0.9-4) and risk-adjusted CABG (logistic EuroSCORE) 1.5% (99% CI 1.4-2%). CUHK post-operative stay was mean 6.7 days (whole database 10.0 days, Asian Zone 12.6 days).

Conclusion: We have implemented a computerized data collection and analysis system and constructed a database for patients undergoing cardiac surgery. We have used this to allow independent data extraction, analysis and benchmarking by a National Society to provide evidence of local activity and outcomes compared to standards set in Europe and Asia.

P3.

Association of Paraoxonase Polymorphisms with Carotid Artery Atherosclerotic in Essential Hypertension patients

HanLu XuXinjuan ZhaoFang LiangXiaohui HuGuangmei
 (Department of Hypertension, the First Affiliated Hospital of Xinjiang Medical University, Urumqi, Xinjiang, 830054. China.)

Purpose: To investigate the relationships between paraoxonase genetic polymorphisms and essential hypertension in carotid artery atherosclerotic patients.

Methods: The study comprised 353 Han participants and 240 Uighur participants who were separately divided into two groups: essential hypertension with carotid artery atherosclerotic disease (CAAD group) and essential hypertension without carotid artery atherosclerotic disease (control group). Genotypes were detected by polymerase chain reactions followed by restriction analyses with specific endonucleases and their frequencies were determined.

Results: In Han people the M allele frequency ($\chi^2=4.038, P=0.044$) was higher in CAAD group than that of control group ($P<0.05$). The CC/CS genotype ($\chi^2=8.39, P=0.02$) and C allele frequency ($\chi^2=8.64, P=0.00$) was higher in CAAD group than that in control group ($P<0.05$). Logistic regression analysis indicated that PON1 55M llele (OR=1.889) and PON2 311C allele (OR=1.692) were independent risk factors for CAAD, respectively. (OR: 95%CI): The combined genotype analysis shows that: carrying PON155 M allele and PON2311 C alleles at the same time were independent risk factors for CAAD (OR=1.428). In Uighur population, the CC/CS genotype ($\chi^2=13.2, P=0.001$) and C allele frequency ($\chi^2=15.2, P=0.000$) was higher in CAAD group than that in control group. Logistic regression analysis indicated that PON2 311C allele was an independent risk factor for CAAD.

Conclusions: PON1 55 M allele and PON2 311 C allele were probably independent risk factors for CAAD in essential hypertension people of Han population in Xinjiang. PON2 311 C allele were probably independent risk factors for CAAD in essential hypertension people of Uighur population in Xinjiang.

P4.

The association among plasma atrial natriuretic peptide, electrolyte and essential hypertension in Uyghur, Han and Kazakh population in Xinjiang

Hu Guangmei, Xu Xinjuan, Liang Xiaohui, Zhulepiya, Chen yulan
 (Department of Hypertension, the First Affiliated Hospital of Xinjiang Medical University, Urumqi, Xinjiang, 830054. China.)

Purpose: To investigate the association among plasma atrial natriuretic peptide, electrolyte and essential hypertension in Uyghur, Han and Kazakh population in Xinjiang.

Methods: The study covered residents aged from 30 to 65 years old which included 681 hypertensive (Uyghur 208, Han 287, Kazakh 229) and 749 normal controls (Uyghur 208, Han 267, Kazakh 266). We assessed whether ANP is associated with the relationship between serum potassium, serum sodium and blood pressure. Analysis was carried out with the SPSS software package (version 13.0).

Results: (1) In normal control group, there were no significant differences between serum potassium and serum sodium in Uyghur, Han and Kazakh population ($P>0.05$). The concentration of Uyghurs' ANP is higher than Hans', and the concentration of Hans' was higher than Kazakhs' ($P<0.05$). (2) In hypertension group, there were no significant differences between serum sodium in Uyghur, Han and Kazakh population ($P>0.05$). The level of serum potassium in Uyghurs and Han are higher than Kazakh ($P<0.05$). The concentration of Uyghurs' ANP was higher than Han, that was higher than Kazakhs' ($P<0.05$). (3) The serum potassium was significantly lower in hypertension group compared with those of normal control group in Kazakh ($P<0.05$). There was no significant difference in the concentration of ANP between the hypertension group and the normal control group. (4) The serum potassium was significantly lower and the ANP concentration was significantly higher in hypertension group compared with those of normal control group in Uyghur. There were no significant differences in serum sodium between the two groups. (5) The serum potassium was significantly lower and the ANP concentration was significantly higher in hypertension group compared with those of normal control group in Han. There were no significant differences in serum sodium between the two groups.

Conclusion: Age and BMI were associated with hypertension in Uyghur, Han and Kazakh. Low serum potassium might be a risk factor of hypertension in Uyghur and Kazakh. Plasma ANP might be a regulate factor in development of hypertension in Uyghur and Han.

