NATIONAL HEART ASSOCIATION OF MALAYSIA

FP1.1

THE USE OF ACTIVE FIXATION LEADS IN THE CORONARY SINUS IN LEFT SIDED PACING LEAD IMPLANTATION: A NOVEL TECHNIQUE TO IMPROVE IMPLANTATION SUCCESS IN DIFFICULT CARDIAC RESYNCHRONIZATION AND BIVENTRICULAR PACING SITUATIONS

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Background: Left ventricular pacing via the coronary sinus is an increasingly common procedure with the wider use of cardiac resynchronisation therapy. Optimal placement is essential for effective left ventricular pacing and avoiding phrenic stimulations. The presence of unfavourable coronary vein anatomy may lead to obstacles during implantation with the use of conventional left ventricular leads. These include lead instability, dislodgements and phrenic stimulations.

Objective: To investigate the use of an active fixation lead mechanism in overcoming these obstacles.

Methodology: Patients who had implantation of 4F active fixation leads (SelectSecure Model 3830, Medtronic, Minneapolis, USA) due to failed conventional left ventricular leads were selected for the study. Pacing parameters were tested at implantation. In the event where the pacing parameters were unsatisfactory, the leads were unscrewed and fixed at a new location until satisfactory paramenters were obtained. We analysed pacing parameters at implantation and follow up as well as monitoring for lead related complications in these patients.

Results: 4F active fixation leads were implanted in a total of 36 patients. Among these, 88.9% were due to lead instability while 11.1% for phrenic stimulations. 17 patients (47.2%) had ischaemic cardiomyopathy. Mean follow up duration was 8.1 months. Pacing threshold at implantation was 1.41 ± 0.68V and impedance was 787 ± 381ohms. On follow up at one month, six months and twelve months, the pacing thresholds were 1.38 ± 0.92V, 1.60 ± 0.83V and 1.44 ± 0.68V, respectively (p=NS), and impedances were 613 ± 199ohms, 659 ± 228ohms and 741 ± 321ohms, respectively (p=NS). No acute, intermediate and long-term complications were seen.

Conclusion: Usage of 4F active fixation lead to overcome left ventricular lead implantation obstacles confers benefit of high success rate, stable pacing parameters and devoid of lead related complications in this group of patients.

FP1.2

PACING IN PATIENTS WITH PROSTHETIC TRICUSPID VALVE: AN IJN EXPERIENCE

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Background: Permanent pacemaker implantations in patients requiring ventricular pacing is usually accomplished by the placement of endocardial pacing lead in the right ventricle. In the presence of prosthetic tricuspid valve, this method has the potential of causing complications to the lead or the prosthetic valve and thus not recommended. Previous recommendation was to implant an epicardial lead either during surgery or in the event a pacing indication appears. With the advent of cardiac resynchronization therapy and biventricular pacing, we explore the option of pacing this group of patients from the coronary sinus.

Objective: To analyse the use of pacing from the coronary sinus in patients with a tricuspid valve prosthesis and a pacing indication.

Methods: Between July 2008 until September 2011, we implanted 6 pacing leads in 5 patients with prosthetic tricuspid valve who required ventricular pacing. We used 2 passive fixation leads in 2 patients and 4 active fixation leads in 4 patients. Active fixation leads were used in view of lead instability as compared to conventional coronary sinus pacing leads. The performances of the leads and its related complications were then monitored.

Results: The leads were successfully implanted in all 5 patients. One patient had a previous passive lead in the coronary sinus, which was later changed to an active fixation lead as the pacing threshold of the passive lead was progressively increasing. The peri-implantation pacing parameters were within acceptable limits. On follow up, pacemaker interrogations revealed stable pacing parameters. No immediate or late complications were observed.

Conclusion: Lead placement in the coronary sinus to deliver left ventricular stimulation in patients with prosthetic tricuspid valve is feasible. The pacing leads in the coronary cinus showed stable and consistent delivery of acceptable pacing performances.

FP1.3

THE INSTITUT JANTUNG NEGARA (THE NATIONAL HEART INSTITUTE OF MALAYSIA) LEFT ATRIAL APPENDAGE OCCLUDER REGISTRY

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Background: The left atrial appendage occluder device has been used in numerous centers to prevent embolic events in patients with non-valvular atrial fibrillation who are not eligible for life-long anticoagulation, with varying success and efficacy rates.

Objective: To report a single center experience in implantation of left atrial appendage occluder device

Methodology: From July 22, 2010 to January 10, 2012 a total of 22 patients with non-valvular atrial fibrillation and CHA2DS2VASc score of at least 2 have been selected in Institut Jantung Negara (IJN) to receive LAA occluder based on the following criteria: prior bleeding (32%), erratic INR (27%), patient compliance factors (27%), and high risk of bleeding (14%). Implantation of the LAA occluder was done under general anaesthesia using fluoroscopy and TEE guidance. Patients were followed up with TEE after 45 days to assess complete endotheliazation to allow stopping oral anticoagulation. Routine clinical follow up was done in all patients from 3 to 12 months.

Results: The patients had a mean age of 59.7, were mostly males (84%), and had a mean CHA2DS2VAS score of 3.3. Most patients received Warfarin (45%) pre-implantation, followed by Dabigatran (41%), and combination of Aspirin and Clopidogrel (11%). Majority of the patients were implanted with a 24mm occluder (23%). Acute success defined by position, compression, stability, and seal assessed via TEE was 100%. Early complications were bleeding (9%) procedural DVT (4.5 %) and delayed GA reversal (4.5%). TEE done after 45 days showed no thrombus, no leakage and good stability in 17 out of 17 (100%) patients. Of the 14 patients previously on anticoagulation, 12 patients were shifted to dual antiplatelet (86%) after 45 days. At latest follow up (3 to 12 months), no patients had stroke, embolism or CV Death.

Conclusion: The LAA occluder device is a relatively safe and effective therapy in preventing embolic events among AF patients who are not eligible to receive life-long anticoagulation.

FP1.4

MULTIPLE ACCESSORY PATHWAYS AND LONG TERM CLINICAL OUTCOMES AFTER RADIOFREQUENCY ABLATION

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Background: Patients with multiple accessory pathways (atrioventricular bypass tracts) frequently pose both diagnostic and clinical management challenges. It is well known that these patients often respond poorly to oral antiarrhythmics. Electrophysiological study and radiofrequency ablation of the accessory pathways offer potentially curative therapy for these patients.

Objectives: The aim of this study is to review the clinical and electrophysiological characteristics of patients with multiple accessory pathways and their clinical outcomes after radiofrequency ablation.

Methods: This is a retrospective study of 46 patients from the year 1995 to 2011 who had multiple atrioventricular accessory pathways presented with episodes of palpitations. Electrophysiological study and radiofrequency ablations were performed. Electrophysiological parameters and anatomical locations of the accessory pathways were studied and analysed.

Results: The min age for this cohort is 33.5 ± 17.8 years. There are more male patients (58.7%) than female patients (41.3%). 45 patients in our cohort had two accessory pathways and one patient had three accessory pathways. Of the 91 accessory pathways, 62 (68%) were manifest and 29 (32%) were concealed. One patient had concomitant atrial septal defect (ASD) and one patient had concomitant patent ductus arteriosus (PDA) but none was reported to have Ebstein anomaly in our particular cohort. The commonest combination locations of the multiple accessory pathways are right posteroseptal and right free wall. Four (8.7%) patients experienced recurrence of palpitations and necessitated repeat electrophysiological study and radiofrequency ablation of the accessory pathways.

Conclusion: Radiofrequency ablation is a feasible and highly effective therapy for patients with multiple accessory pathways who present with palpitations. There is a high success rate with a relatively low recurrence rate of 8.7% in our study.

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FP1.5

PREVALENCE OF ASYMPTOMATIC ATRIAL FIBRILLATION IN MALAYSIAN PATIENTS WITH HYPERTENSION

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Background: A trial fibrillation is usually asymptomatic and often associated with established cardiovascular risk factors such as hypertension. The prevalence atrial fibrillation in patients admitted to Malaysian hospitals is known, but asymptomatic atrial fibrillation (AAF) in hypertensive patients in the primary care setting is not established.

Objective: To ascertain the prevalence of AAF in hypertensive patients in Malaysia, in a primary care setting; and in conjunction with published data from the National Health and Morbidity Survey III (NHMS III) and the Department of Statistics in Malaysia, to estimate the number of patients with AAF in Malaysia.

Methodology: Clinical and electrocardiography (ECG) data were retrospectively collected from consecutive patients aged ≥30 years attending a hypertensive clinic where vital signs and a 12-lead ECG were routinely undertaken, and had no typical symptoms of atrial fibrillation, over 45 working days between 6/8/2011-12/10/2011.

Results: Of 3789 patients attending the hypertension clinic, 1994 patients had complete clinical and ECG data for analysis. 38.5% patients were male. The mean age was 53.6 ±12.1 years. 15 patients had AAF confirmed on ECG, giving an overall prevalence of 0.75% in this study population, with the proportion similar in males and females (0.79% vs 0.74%, respectively). The prevalence of AAF increases with age in the age groups of 30-40, >40-50, >50-60, >60-70, >70-80 years old were 0%, 0.17%, 0.34%, 2.17%, 2.38%, respectively. The NHMS III revealed that 42.6% of adult Malaysians ≥30 years old had hypertension. Estimating that 50% of the 26.8 million population in Malaysia in 2006 were ≥ 30 years old, the number of those having hypertension would be 13.4 million, and the number of people with AAF would be 100,500 patients. Extrapolating to 28.3 million population in Malaysia in 2010, the corresponding number of people with AAF would be 106,500.

Conclusion: The prevalence of AAF in hypertensive patients ≥30 years old at the primary care setting in Malaysia is 0.75%. The estimated number of Malaysians with AAF in 2010 would be 106,500. With a large population at risk AAF-related complications, including strokes, there is justification for an even greater emphasis on diagnostic, primary and secondary prevention strategies.

FP1.6

THE PREVALENCE AND PREDICTORS OF LEFT VENTRICULAR THROMBUS FORMATION IN PATIENTS WITH ISCHEMIC CARDIOMYOPATHY IN SINUS RHYTHM

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Background: Patients with left ventricular (LV) systolic dysfunction are at increased risk of LV thrombus (LVT) formation and thromboembolism. Previous studies using echocardiography for thrombus detection have yielded inconsistent findings regarding prevalence and predictors of thrombus formation. Contrast-enhanced cardiac magnetic resonance imaging (CMR) is superior to echocardiography in the detection of LVT. The local prevalence and predictors of LVT in this population, utilizing CMR as the imaging modality, has not been established.

Study Objectives: To determine the prevalence and predictors of LVT in patients with ischemic cardiomyopathy who are in sinus rhythm

Methodology: Prevalence of LVT was determined in 187 consecutive patients with ischemic cardiomyopathy (defined as LV ejection fraction (LVEF) <45% and coronary artery disease diagnosed with coronary angiography) in sinus rhythm who underwent CMR in Sarawak General Hospital between 2005 and 2011. Clinical and CMR imaging parameters were assessed to determine the predictors of LVT formation.

Results: LVT was detected in 10.2% of patients. The mean LVEF was 26.1±7.8 and 29.0±8.9 in the LVT and no LVT groups respectively, with a trend towards poorer LV function in the LVT group despite statistical non-significance (p=0.17). Parameters like age, gender, diabetes mellitus, hypertension, former or current smoking, previous stroke, previous acute coronary syndrome, estimated glomerular filtration rate, body mass index, number of diseased vessel(s), previous coronary revascularization, number of non-viable myocardium area by vascular supply, LV aneurysm and LV end systolic and diastolic volumes were not statistically different between groups. In the LVT group, 47% were on anticoagulation therapy prior to CMR for suspected LVT or LV aneurysm, compared to 7.7% (p <0.01) in the no LVT group. 58% and 26% were on single and double antiplatelet therapy respectively in the LVT group compared to 77% (p 0.72) and 21% (p 0.63) in the no LVT group. Non-viability in myocardium supplied by left anterior descending artery (LAD) (p<0.01) and right coronary artery (RCA) (p<0.01) were associated with LVT formation, while a history of former or current smoking (p<0.05) was a negative association.

Conclusion: In this cohort of patients with ischemic cardiomyopathy in sinus rhythm, the prevalence of LVT is 10.2%. Non-viability in myocardium supplied by LAD and RCA were independent positive predictors of LVT formation while a history of former or current smoking was a negative predictor. While the benefit of anticoagulation therapy across the broad spectrum of patients with LV systolic dysfunction remains unclear, there might be a role for individualized treatment tailored to those with high risk of developing LVT.

FP1.7

NT-PROBNP LEVELS, AS PREDICTOR OF LEFT VENTRICULAR SYSTOLIC AND DIASTOLIC DYSFUNCTION IN PATIENTS WITH CHRONIC HEART FAILURE

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Background: Heart failure (HF) is a complex clinical syndrome that can result from any structural or functional cardiac disorder that impairs the ability of the ventricle to fill with or eject blood, echocardiography parameters shown that correlate well with left ventricular (LV) diastolic and systolic functions.chronic heart failure (CHF) is currently recognized as a clinical syndrome occurring not only as a result of mechanical dysfunction of the ventricles, but also due to complex molecular, endocrine, neuroendocrine, and inflammatory changes .

Objective The objective was to assess the correlation between echocardiographic parameters and plasma N-terminal pro brain natriuretic peptide (NT- proBNP) level in patient with systolic or diastolic dysfunction.

Method: The study involved 109 patients with heart failure, conventional and tissue Doppler (TDI) echocardiographic parameters correlating with NT-proBNP level which taken at the same time.

Results: Age and echocardiographic parameters compared with plasma NT-proBNP levels, no relationship of NT-proBNP level with age (r =0.013, p = 0.895), significant correlations were found between NT-proBNP level and late diastolic mitral annulus velocity Am (r = 0.72, P=0.000), systolic mitral annulus velocity Sm (r = 0.72, p= 0.000), early diastolic mitral annulus velocity Em (r = 0.51, p=0.000), early transmitral to Em velocity ratio (r = 0.51, p= 0,000), LV ejection fraction (r = 0.83, p =0.000). In multiple regression model revealed log NT-proBNP levels, independently related to age, LV ejection fraction, Am velocity and Em velocity (R^2=0.78, P=0.000). The ejection fraction and systolic velocity were the most important predictor of NT-proBNP level.

Conclusion: NT-proBNP levels correlate strongly with echocardiographic parameters, and provide routine simple, accurate parameters of heart failure; routine NT-proBNP testing may thus be useful in places where echocardiography machine is not available to evaluate the LV function.

FP1.8

VENTRICULAR ASSIST DEVICES, AN OPTION FOR PATIENTS WITH END STAGE HEART FAILURE: EXPERIENCE AT INSTITUT JANTUNG NEGARA

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Background: Despite recent advancement in the management of heart failure, the quality of life and the survival rate of patients with severe heart failure remains limited. The one-year mortality rate of those with advanced disease exceeded 50 % and the occurrence of sudden death is frequent. For those patients who are suitable candidates, cardiac transplantation is the gold standard of treatment with proven benefit. However, worldwide shortages of donor hearts have resulted in the development of Ventricle Assist Device (VAD) to "bridge patients" to heart transplant. This paper examines the experience with left ventricular assist devices in heart failure patients at Institut Jantung Negara (IJN)

Results: Since 2005, IJN has carried out 13 VAD implantations in patients with terminal heart failure. The mean age of these patients was 30.9 years-old and ranging from 13 to 46 years-old. Only 3 out of the 13 patients were female. Most patients suffer from idiopathic cardiomyopathy (9 patients), 3 patients had ischaemic cardiomyopathy and one patient had post-partum cardiomyopathy. 6 patients were on inotropes prior to VAD implant (Intermacs profile 2 and 3). 11 out of the 13 patients were implanted as a bridge to transplantation . 2 patients were implanted as a destination therapy as heart transplant was unsuitable due to raised pulmonary pressure. Since 2010, the smaller and streamlined design of axial (HM II) and centrifugal flow pumps (Heartware) has been implanted instead of the pulsatile pumps (PVAD and IVAD) which were much larger.Outcomes: 4 patients died following implantation. The causes of death were bowel ischaemia (1 patient), haemorrhagic stroke (2 patients) and septicaemia with multiple organ failure (1 patient). 1 patient developed persistent pseudomonal infection and had surgical debridement. 3 patients received heart transplant and remaining 6 patients are on on-going support from the VAD.

Conclusion: VAD implantation is an option in end stage heart failure patients as a "bridge to heart transplant" or as "destination therapy" in suitable candidates.

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FP2.1

IMMEDIATE AND SHORT TERM OUTCOMES OF MITRACLIP THERAPY FOR SEVERE MITRAL REGURGITATION

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Background: Percutaneous mitral valve repair using the Transcatheter Mitraclip device is a novel therapy for treating severe mitral regurgitations (MR). Mitraclip therapy consists of percutaneous edge-to-edge coaptation of the mitral leaflets that is analogous to the surgical Alfieri technique.

Objectives: This is a prospective single centre study to evaluate the feasibility, safety and efficacy of the Mitraclip system

Methology: Patients were screened with transthoracic (TTE) and if suitable, underwent transoesophageal echocardiography (TEE) to assess the mitral valve in detail. Seven patients with MR > 3+ MR underwent percutaneous mitral valve repair under general anaesthesia from the 14th to the 20th December 2011. We assessed their MR with TEE during screening and TTE immediately post procedure and 1 month later. NTproBNP, 6 minutes walk test (6MWT), NewYork Heart Association (NYHA) status and SF 36 quality of life questionnaires were measured during screening and during their follow-up.

Results: The average age for mitraclip therapy was 59 ± 7 years in which three patients had degenerative MR and two patients had rheumatic and functional MR respectively. All patients had successful deployment of the mitraclip device (100%). Three patients had two clips deployed. There were no deaths or cerebrovascular accident in our mitraclip patients. One patient required two pints of blood but this was not directly related to the mitraclip procedure itself and one developed transient atrial fibrillation but reverted to sinus rhythm before discharged. All patients (100%) had good immediate results with MR < 2+. All patients were extubated within the same day with an average CCU stay of 2.5 + 0.9 days. Six patients (85%) had MR < 2+ prior to discharge. At 1 month follow-up post mitraclip, there was generally an improvement in their NYHA and QOL status. However, there were no significant differences yet in their 6mwt , NTproBNP or their left ventricular dimensions. Six patients (85%) maintained to have MR < 2+.

Conclusion: Percutaneous mitral valve repair with the Mitraclip system appears to be safe with good immediate and short term results. These patients will be assessed every six months to evaluate the intermediate and long term outcome.

FP2.2

FRACTIONAL FLOW RESERVE AND ITS CLINICAL OUTCOME IN HOSPITAL SERDANG

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Introduction: The numbers of coronary interventions have increased tremendously and even experienced operators cannot adequately assess moderate coronary lesions based on the angiographic appearance alone. Fractional flow reserve (FFR) has emerged as a simple, reliable and reproducible physiologic assessment of lesion severity.

Methods: This study describes the usage of FFR currently in Hospital Serdang and investigates the patients who underwent this assessment and to determine its outcome. An FFR value of < 0.75 predicts significant ischaemia. It is safe to defer PCI when FFR ≥ 0.80. 0.75 to < 0.80 has been termed the grey zone. At our centre, a cut off value of < 0.80 is used to indicate significant ischaemia and to determine whether the patient requires intervention.

Results: In Hospital Serdang, 2776 patients underwent coronary angiogram in 2011, and 880 (31.7%) subsequently underwent percutaneous coronary intervention (PCI). 39 patients (4.4% of PCIs) with moderate coronary lesions underwent physiologic assessment (FFR) using the Radiwire system with bolus intra-coronary adenosine used to achieve hyperaemic state. 14 patients (36%) demonstrated significant ischemia and 12 of them (31%) were stented. There were 2 patients (0.05%) with significant coronary lesions that were not intervened for various reasons. The remaining 25 patients (64%) revealed non-significant coronary lesions that were managed conservatively.Out of the total patients who went for FFR, only 26 patients (67%) came for follow up and 23 patients remained asymptomatic. Of the remaining three patients who were symptomatic , one patient subsequently underwent intervention and two were medically treated.

Conclusion: After our small study, we have found that FFR is an important adjunct tool to cardiac intervention. Firstly it averts unnecessary PCIs from being performed. Secondly it reduces long term adverse cardiac events as a result of overzealous intervention. Thirdly, it can be performed safely and quickly. In the long term, FFR brings substantial cost savings to the patient and our centre.

FP2.3

LEFT MAIN CORONARY VESSEL ANGIOPLASTY IN ACUTE CORONARY SYNDROME: EXPERIENCE FROM NCVD-PCI REGISTRY

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on behalf of National Cardiovascular Database (NCVD) writing committee

Introduction: Acute coronary syndrome (ACS) caused by stenotic lesion at left main coronary vessel is uncommon. However the mortality associated with ACS associated with this anatomical location is high. Percutaneous coronary intervention (PCI) has been used in the ACS setting but its clinical efficacy is largely unknown.
Methods: The Malaysian NCVD-PCI registry is a voluntary, multi-centered, observational cohort study designed to evaluate the clinical outcome of patients, 18 years old or above with coronary artery disease who underwent PCI in major cardiac centers in Malaysia. From 2007 to 2009, a total of 10,601 patients were admitted for PCI procedure. This registry reported 11,498 PCI procedures were done during the same period. A total of 15,538 lesions were treated with PCI. We performed statistical analysis on patients whom PCI was performed on left main stem.

Results: In the registry, a total of 287 (1.8%) lesions were of left main coronary artery in location. Left main stem interventions were performed in 98 (34.2%) patients presented with ACS. The incidence of AMI and NSTEMI was equal in this cohort. No significant difference was seen between age, gender, history of previous bypass and traditional cardiac risk factors among patients with ACS or without. More than half (55%) of the patients presented with ACS developed Killips II or higher. About 85% of the patients presented with ACS had no previous bypass surgery. About 51% patients with ACS had TIMI flow 2 or less on diagnostic angiography. Indeed, about 15% of ACS patients had no flow on diagnostic angiography. Interventions were successful in more than 95% of cases and TIMI III flow achieved in 96% of patients. Drug eluting stents were used less commonly among ACS patients (74.2%) than non ACS patients (94.3%). Complications were more common among ACS patients than non ACS patiens: vessel dissection (13.4% vs 8.5%), no reflow (4.1% vs 0.5%) and perforation (2% vs 1%). Clinical significant bleeding complication was rare. About 10% of ACS patients who underwent LMS PCI died during the index admission compared with 1.6% among non-ACS patients.

Conclusion: Left main coronary vessel angioplasty intervention in the setting of acute coronary event is a viable option in view of high risk profiles of these patients. Our data was comparable with published papers.

FP2.4

SERUM B-TYPE NATRIURETIC PEPTIDE (BNP) PREDICTS OBSTRUCTIVE CORONARY LESIONS IN STABLE CORONARY ARTERY DISEASE AND LEVEL INCREASES AFTER CORONARY ANGIOGRAPHY.

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Background: B-type natriuretic peptide (BNP) has been widely reported to be not only a sensitive marker for left ventricular failure and acute coronary syndrome but also carries a prognostic value in patients with coronary artery disease. However, other relationship between BNP with stable coronary artery disease is not clear and little data is available regarding the effect of coronary angiography on serum level of BNP. Hence we investigate serum BNP level in relation to predicting the extent of coronary artery lesion and how it is affected by coronary angiography in stable patients.

Objectives: 1) To evaluate the potential role of BNP in predicting the presence of obstructive coronary lesion in patients with stable coronary artery disease. 2) To examine to effect of coronary angiography on serum BNP level.

Methodology: 1) We prospectively examined 25 patients who were electively admitted for coronary angiography. 2) All patients had normal left ventricular ejection fraction on echocardiography. 3) Blood samples were taken at 0H and 24H post coronary angiogram and tested for serum BNP level using Alere Triage® NGAL Test (point-of-care fluorescence immunoassay for the rapid, quantitative determination of BNP). 4) These patients were then divided in 2 groups (based on their coronary angiography): Group 1 were those with normal or non-obstructive coronary lesions (less than 70% stenosis in any vessel). Group 2 were those with obstructive coronary lesions (70% stenosis or more in any vessel)

Results: 1) Serum BNP pre-angiography was significantly higher in patients with obstructive coronary lesions (Group 2) compared to those without obstructive lesion (Group 1) (U= 2 , P=0.027). 2) Serum BNP raises significantly 24hours post coronary angiography (Z = -2.40, P = 0.016).

Conclusion: 1) Serum BNP is a potential marker in predicting the presence of obstructive coronary lesion in stable patients with coronary artery disease. Hence it is potentially useful in predicting patients who would likely to be needing coronary artery revascularization. 2) Serum BNP rises significantly after coronary angiography making any measurement post angiography unreliable for accurate assessment.

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FP2.5

CATHETER-BASED SELECTIVE RENAL ARTERY DENERVATION FOR THE TREATMENT OF RESISTANT HYPERTENSION IN ASIAN POPULATION; AN INITIAL EXPERIENCE IN MALAYSIA.

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Background: Hypertension is a major risk factor for stroke, heart disease and kidney failure. While current treatment options of lifestyle modification and pharmacotherapy is successful in lowering lood Pressure to target goal in the majority, an estimated 16-27% of subset population has treatment Resistant Hypertension despite multiple medications. Adding more medications bring concerns of tolerance, side effects, compliance and costs. Recently, a novel technique using Radiofrequency Energy to ablate renal artery sympathetic nerves has been shown to reduce blood pressure in Resistant Hypertension patients.

Objectives: To describe our initial experience of using a device based, percutaneous approach of selectively denervating the renal sympathetic nerves using Radiofrequency Ablation (Symplicity® Catheter system) to treat Resistant Hypertension patients in Malaysia.

Methodology: Between September 2011 and January 2012, a total of 11 (consecutive) patients with Resistant Hypertension who consented and met the criteria who underwent Renal Artery Denervation using the Symplicity Catheter system were included in the study. Five patients (45.4%) were Malay, three (27.3%) Chinese and three (27.3%) Indian. Patients came back for follow up at two weeks and one month post procedure. Office Blood Pressure and Ambulatory Blood Pressure recording (ABPM) using BPro® Radial Pulse Wave device were recorded, as well as blood and urine tests.

Results: 10 patients had successful denervation of both renal arteries. The mean procedure time was 61.9 ± 8.6 minutes and mean contrast used 170 ± 45 mL. An average of 4.6 ± 1.6 ablations were performed in the Right renal artery and 4.2 ± 1.6 in the Left renal artery. At baseline mean Office Blood Pressure was 184/88 ± 14/9 and mean ABPM was 156/85 ± 18/16. At 2 weeks follow up, the mean systolic Office BP reduced to 166 ± 29 (p = 0.09) and mean systolic ABPM was 156 ± 18 (p = 0.54). The mean diastolic Office BP reduced to 82 ± 12 (p= 0.10) and mean diastolic ABPM was 84 ± 14 (p = 0.79). At one month follow up, the mean systolic Office BP reduced significantly to 158 ± 28 (p = 0.01) and mean systolic ABPM was 140 ± 14 (p = 0.12). The mean diastolic Office BP reduced to 80 ± 15 (p= 0.07) and mean diastolic ABPM was 80 ± 14 (p = 0.54).The baseline mean Serum Creatinine level was 84 ± 17 ummol/L. There was no significant difference at two weeks and one month follow up.

Conclusion: Catheter based Renal Artery denervation with Radiofrequency Energy seems to be effective at reducing the Blood Pressure of Resistant Hypertension patients at one month follow up with minimal adverse effects.

FP2.6

ANTITHROMBOTIC USAGE AND 30-DAY OUTCOMES: THE MALAYSIAN NCVD-PCI REGISTRY EXPERIENCE

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on behalf of the National Cardiovascular Disease Database,1Sarawak General Hospital Heart Centre, Kota Samarahan, Malaysia, 2Clinical Research Centre, Sarawak General Hospital, Kuching, Malaysia, 3Faculty of Medicine and Health Sciences, University Malaysia Sarawak, Kota Samarahan, 4University Malaya Medical Centre, 5Hospital Pulau Pinang, 6Hospital Sultanah Aminah, 7Hospital Queen Elizabeth, 8Institut Jantung Negara

Background: Adjunctive antiplatelet therapy is an important component to reducing major acute, short- and long-term adverse clinical outcomes (MACE) during and following percutaneous coronary intervention (PCI). The National Cardiovascular Disease (NCVD)-PCI Registry also assessed antithrombotic use in patients undergoing PCI in Malaysia.

Objective: To determine antithrombotic use at the time of PCI, and their relationship with 30-day mortality and bleeding outcomes.

Methodology: From the NCVD-PCI Registry encompassing 10602 patients who underwent PCI in Malaysia at 11 tertiary cardiology centres between 2007-2009, data from 10565 (99.7%) were complete and used for analysis.

Results: The mean age of patients was 57±10 years; 81.5% were male; 24.4% aged below 50 years old; 98% of patients had at least one conventional cardiovascular risk factor. Anticoagulants given pre and during procedure, 92% of patients were prescribed unfractionated heparin (UFH), 4% of patients were prescribed low molecular weight heparin (LMWH). For patients on antiplatelets, 97% were prescribed Aspirin, while 98% were prescribed clopidogrel during the admission. 8973 patients (85%) received clopidogrel prior to PCI: of these patients (a) 3827 were continued on 75mg of clopidogrel, 30.1% took it <24 hours prior to PCI (PTPCI), 19% took it 24-72 hours PTPCI, and 50.9% >72 hours PTPCI; (b) for those taking 300mg loading dose (n=4734), 58.3% took it <24 hours PTPCI, 19.4% took it 24-72 hours PTPCI, and 22.3% >72 hours PTPCI; (c) for those taking 600mg loading dose (n=412), 77.7% took it <24 hours PTPCI, 5.1% took it 24-72 hours PTPCI, and 17.2% >72 hours PTPCI. Total 30-day mortality was 117 (1.3%); in group (a), 12.8%, 3.4%, 6.8%; group (b), 42.3%, 12.0%, 11.1%; group (c), 10.3%, 0%, 1.0%, respectively. 65.8% of patients with a 30-day mortality occurred after PCI following an acute coronary syndrome (ACS) event, and from these 76.6% had clopidogrel loading <24 hours PTPCI. Overall, at 30 days, there were only 3 cases (0.03%) of major bleeding.

Conclusion: There was a large variation in the type of antithrombotic use, especially for clopidogrel loading patterns PTPCI. We noted that the majority of patients with 30-day mortality were of the group having emergent PCI following ACS. It appeared that those patients who received earlier and higher loading dose (600mg clopidogrel) prior to PCI had better outcome. Major bleeding was rare.

FP2.7

PERCUTANEOUS TRANSCATHETER AORTIC VALVE IMPLANTATION (TAVI) IN SELECTED HIGH RISK SYMPTOMATIC PATIENTS WITH AORTIC STENOSIS : A MALAYSIAN SINGLE CETER EXPERIENCE

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Background: Recently the transcatheter aortic valve implantation (TAVI) has been introduced to treat severe symptomatic aortic stenosis on patient unsuitable to undergo the Aortic valve replacement (AVR) . It has become a rapidly evolving procedure and, National Heart Institute (IJN) is the only centre in Malaysia performing this procedure since 2009.

Objectives: This paper describes a single center experience with our first 18 TAVI procedures using the Medtronic CoreValve ® to treat severe symptomatic aortic stenosis patients.

Methodology: From Nov 2009, 18 patients with symptomatic severe aortic stenosis and unsuitable for AVR were recruited and undergone TAVI procedure . The mean age was 76 ± 4 years (minimum age 66 and maximum age 83). Majority of the patients (14) are male . As per racial distribution, majority are Malays (61%), followed by Indian (22%) and Chinese (17%). 11 patients have hypertension and coronary artery disease, eight has Type 2 DM, five has chronic renal impairment, three has Atrial Fibrillation, three with chronic obstructive airways disease, two has chronic anaemia. One patient had Myaesthenia Gravis and another had previous resected lung tumour and adenocarcinoma of the colon. The average New York Heart Association classification is 2.3 ± 0.8.Majority of the procedure was done via the transfemoral approach (16 cases) while one had procedure via transsubclavian approach and another had to go for femoral cutdown approach. The procedure average time was 130 mins and the mode Corevalve size used is 29 mm.

Results: As according to the VARC (Valve Academic Research Conferences) 2010 criteria; our device success rate was 100% , no mortality within 30 days and 88.9% succes rate of 30 days combined safety endpoints.Echocardiographic mean aortic valve area increased significantly from 0.57 ± 0.13 to 2.1 ± 0.5 (p<0.001) ; AV peak gradient 97 ± 28 mmHg decreased to 15 ± 7 mmHg (p<0.001), functional class improved from 2.3 ± 0.8 to 1.5 ± 0.6 (p=0.003). The EF% does not change significanly ;changed from 61 ± 8 to 60 ± 9 (p=0.625). Median length of hospital admission was 8 days (6-174 days). A patient had right sided CVA, one had acute MI (two days post TAVI necessitating primary PCI), four needed permanent pacemaker implantation, one had infected groin hematoma, one had iliopsoas abscess requiring prolonged antibiotics and drainage and no death within 6 months follow-up.

Conclusion: It has been demonstrated that in selected high risk aortic stenosis patient, transcatheter aortic valve implantation is safe with low risk complications and significantly improve both the echocardiography parameter (increased mean aortic valve area and reduction of Aortic valve mean gradient) and the clinical outcomes (NYHA classifications).

FP2.8

LONGITUDINAL STENT COMPRESSION : IS IT FOR REAL?

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Background: Newer generation of stents with improvement in stent design have enabled more percutaneous coronary intervention (PCI) procedures to be done in complex coronary artery disease (CCAD). 2011 was the year longitudinal stent compression (LSC) controversy erupted. LCS could be the result of individual or class effect of stent design weakness, in particular the longitudinal stent strength.

Objective: i)To identify LSC and its incidence rate in the local real world setting. ii)To identify possible aetiology and predictors for the occurrence of LSC. iii)To identify remedial measures for LSC and any major adverse cardiac event (MACE).

Methodology: This was an observational study conducted in a cardiac center with high volume of cardiac catheterisation cases over a 12 month period, looking for the occurrence of LSC, procedural analysis and follow up of index cases for MACE. We reviewed 908 consecutive PCI cases angiography and files and conducted discussion with fellow interventional colleagues for their personal experience of LSC.

Results: There were two cases of LSC, giving an incidence rate of 0.22% per annum. Both happened in diabetic male patients; one in elective and one in emergency setting. In the elective case, balloonplasty after the deployment of Promus Element stent in left circumflex artery to release the entrapped BMW wire caused proximal stent invagination and compression. Unfortunately, we couldn't salvage and correct the LSC due to technical difficulty. Subsequent functional testing with dobutamine stress ECHO was negative. The second case was an acute left main (LM) occlusion with Promus Element stent deployed from proximal left anterior descending artery (LAD) to ostial LM. The deployed LM stent was compressed by the guiding catheter. The damaged stent segment was successful ballooned and the exposed ostial LM was covered with another stent, Xience V. Median follow up was 82 days with no MACE.

Conclusion: There was 0.22% incidence rate of LCS in our center, exclusively with a single type of stent, possibly its excellent radio-opacity characteristic enabled prompt detection of LSC and its common usage in CCAD PCI. We believe LSC is not a new phenomenon, maybe under reported and already existed in the local real world setting with various type of stents. We urge scrupulous PCI technique to prevent this technical PCI malady.

NATIONAL HEART ASSOCIATION OF MALAYSIA

FP3.1

EVALUATION OF WARFARIN MEDICATION THERAPY ADHERANCE CLINIC (MTAC): IMPROVING PATIENT CARE

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Background: Achieving and maintaining optimal INR therapeutic range is crucial to determine best outcome for warfarin therapy. Time in therapeutic range (TTR) is an important tool to assess the quality of warfarin treatment, and has been shown to correlate with less bleeding and thrombo-embolic complications. It has been reckoned that collaboration between pharmacists and physician in Warfarin Medication Therapy Adherence Clinic (MTAC) can improve patient care.
Objectives: Main outcome was to measure TTR; both actual- and expanded-TTR (were the percentage of TTR within ± 0.2 units of the recommended range). Second outcomes were the hospitalization rate due to over-warfarinasation and average dose based on age, gender and ethnicity.

Methodology: A 3-year period prospective cohort study was carried out in warfarin MTAC at Hospital Tengku Ampuan Afzan. Patients on warfarin as on 1st May 2008 to 30th of April 2011 were included in this study. Time in Therapeutic Range (TTR), before and after the collaboration, hospitalisation event due to over-warfarinisation, average dose based on age, gender and ethnicity were evaluated.

Results: A total of 106 patients were included: 50.9% were male, with a mean age of 62.13 ± 14.17 years. The main indications for warfarin therapy were atrial fibrillation (61.3%). Both actual-TTR (62.8% vs. 57.3%; P = 0.034) and expanded-TTR (71.51% vs. 63.90%; P = 0.003) are significantly greater during collaboration compared with the period before collaboration. Hospitalisation event due to over-warfarinisation reduced significantly from the 22.90% to 7.54% (p=0.02) after collaboration. The mean weekly dose for age >65 and <65 years old was 19.74mg daily Vs 26.28mg respectively. Ethnicity and gender showed no difference in average dose.

Conclusion: The collaboration between pharmacist and physician in warfarin MTAC achieved significantly better INR control and improve patient care. Based on this study, average dose evaluated may be an effective guide for initiating warfarin therapy with these results verified in the future studies.

FP3.2

DETERMINATIONS OF WARFARIN USE AND ANTICOAGULATION LEVELS IN MEDICATION THERAPY ADHERENCE CLINIC (MTAC) PROGRAMME

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Background: Medication Therapy Adherence Clinic (MTAC) for warfarin is also known as collaborative prescribing by pharmacists under warfarin protocol to adjust anticoagulation dosages.To date the pharmacists management in anticoagulants in terms of therapeutic control has not been appraised.

Objective: To investigate the anticoagulation control among patients managed through MTAC warfarin programme.

Methodology: This study utilized primary data that was collected since January 2010 as part of a study on bleeding risk at an outpatient MTAC warfarin at Sarawak General Hospital Heart Centre. Of 155 patients enrolled in the bleeding risk study, only 112 (male=57, female=55) completed at least 3 subsequent clinic visits for investigation.

Results: The mean age for males was 57.3 ± 13.4 years and females 56.0 ± 14.3 years old. Mean body weight of males was 67.4 ± 11.8kg (range, 50.5 - 101.0kg) and females 59.1 ± 12.0kg (range 33.2 to 85.0kg). Both valvular (i.e. requiring valve replacements) and non-valvular groups consistently showed similar or better anticoagulation control throughout study period. At the initial review at warfarin clinic the non-valvular group (n=76) the mean INR was 2.55 ± 0.88 compared to the valvular group (n=36) with mean INR 2.45 ± 0.67. In patients with mechanical valve replacements, which required a higher therapeutic target (TT) had initially demonstrated a poor response to warfarin at the first, and third clinic visit with mean INR 2.45 ± 0.67 (95%CI; 2.22 to 2.67) and 2.40 ± 0.56 (95%CI;2.21 to 2.59), respectively. Only after the fourth clinic visit whereby valvular group (n=47, 50.0%) and non-valvular group (n=47, 50.0%) had reached the TT with mean INR 2.73 ± 1.1 (95%CI; 2.39 to 3.04) and 2.31 ± 0.7 (95%CI; 1.96 to 2.39), respectively. In addition, patients with higher target INR 2.5 to 3.5 (n=31, 32.9%) showed a significant difference in the TT with mean INR 2.73 ± 0.91 (95%CI; 2.39 to 3.06; p=0.024).

Conclusion: A collaboration of clinical pharmacists through MTAC programme was associated with considerable improvement in initiation of anticoagulation therapeutic range and monitoring. The assessment should be considered as an important value of MTAC warfarin programme to the health care system in Malaysia.

FP3.3

IMPACT OF CYP2C19 ALLELIC VARIANTS ON CLOPIDOGREL AND CLOPIDOGREL METABOLITE LEVELS IN PATIENTS PLANNED FOR PCI

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Background: Clopidogrel, given in combination with aspirin, is a common dual antiplatelet strategy for patients planned for elective percutaneous coronary intervention (PCI). Gene variations encoding the cytochrome P450 system (CYP), involved in Clopidogrel metabolism, are associated with an altered pharmacokinetic response. Amongst its metabolites, of which at least one is active, is Clopidogrel Carboxylic Acid (CCA).

Objectives: We sought to determine the impact of CYP2C19 allelic variants on unchanged Clopidogrel and CCA levels in Malaysian patients planned for PCI.

Methodology: Of 237 patients enrolled between 18/10/2010 - 4/3/2011, 150 were pre-treated with Clopidogrel at the time of enrolment prior to undergoing coronary angiography. Clopidogrel and CCA levels were measured by LC-MSMS method. Patients were divided into 3 groups: Group 1- Clopidogrel 75mg ≤ 3 days (n=20); Group 2- Clopidogrel 75mg ≥4 days (n=118) and Group 3- Clopidogrel 300mg single dose (n=12). Concentration of clopidogrel and CCA levels (ng/ml) were compared between wild type (*1/*1) and allelic variants (*1/*2, *1/*3, *2/*3, *2/*2) of CYP2C19 in patients in each group.

Results: The mean duration, between ingesting the last dose of clopidogrel and venesection for drug level analysis, between wild type and variants were: in Group 1: 1155±768.42 min (n=5) vs 578.01±791.69 min (n=15); Group 2: 535.7±555.43 min (n=50) vs 578.01±791.69 min (n=68); and Group 3: 210min (n=1) vs 442.73 ±415.04 min (n=11); (p=NS within groups). Mean levels of CCA, comparing wild type and variants, in Groups 1-3 were 411.75±695.82 vs 831.06±798.65 (p=0.07), 988.47±1120.36 vs 975.72±1116.41 (p=0.71) and 738.88 vs 2116.38 ± 2517.26 (p=0.67). Mean levels of clopidogrel, comparing wild type and variants, in Groups 1-3 were 2.45±5.37 vs 1.13±1.72 (p=0.395), 1.01±2.17 vs 0.74±0.96 (p=0.715), and 1.86 vs 1.26±1.60 (p=0.47). Overall, in the study cohort (wild type=56; variants=94) both clopidogrel and CCA levels were not significantly affected by genotype (p=0.95, p= 0.58, respectively). In group 2, we found that age > 58 years, gender and a history of acute coronary syndrome ≤7 days did not significantly affect clopidogrel and CCA levels between wild type and variants.

Conclusion: CYP2C19 allelic variants had no significant impact on Clopidogrel and CCA levels in Malaysian patients planned for elective PCI.

FP3.4

ASSESSMENT OF ADHERENCE TO ACUTE CORONARY SYNDROME SECONDARY PREVENTION PHARMACOTHERAPY

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Background: The combination of antiplatelets, beta-blockers (BB), HMG-CoA Reductase Inhibitors (Statins) and Angiotensin Converting Enzyme Inhibitors/Angiotensin Receptor Blockers (ACEI/ARBs), improve cardiovascular outcomes for Acute Coronary Syndrome (ACS). However, studies have shown that medication therapy discontinuation after an episode of myocardial infarction is common and occurs early after discharge, resulting in an increased risk of mortality. It was also shown that patients with chronic cardiovascular conditions adhere only to 50% to 60% of the medications.

Objective: To evaluate the rate of adherence via prescription refill amongst ACS patients throughout a one year period after discharge.

Methodology: 1 year record review was conducted for patients discharged with ACS from 9/8/2010 to 8/12/2010. Data was obtained from ward, clinic and pharmacy documentations and analyzed using SPSS version 16.0.

Results: 49 patients were recruited with the mean age of 58.92 ± 1.56; 77.6% were male. Upon discharge it was found that 95.9% of patients were prescribed with double antiplatelets; 98% with Statins; 91.8% with BB; and 69.4% with either ACEI or ARB. 65.3% of the patients received all class of ACSSPP. The change in treatment regime was not significant after one year follow-up in outpatient clinic. However, it was found that 13 patients (26.5%) defaulted treatment, with 7 of them received either partial or full revascularization. At one year, the mean rate of adherence to therapy was 54.8% with the average refill of 3.62 per year. There was poor association between the rate of adherence and dosing complexity of the regime (r = -0.22), and the total number of medications being prescribed (r = -0.06).

Conclusion: There is an encouraging use of evidence-based ACS secondary prevention pharmacotherapy upon discharge. However, a significant number of patients defaulted treatment and poor adherence may prove to be a difficult challenge in improving long term cardiovascular outcomes in ACS patients. Further studies are required to identify the possible reasons for poor adherence to treatment and to formulate effective interventions to this issue.

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FP3.5

ASSESSMENT OF NEUTROPHIL TO LYMPHOCYTE RATIO IN ACUTE CORONARY SYNDROME COMPLICATED BY ACUTE PULMONARY OEDEMA

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Background: Neutrophil to Lymphocyte ratio (NLR), an easily obtainable blood marker of inflammation has been associated with adverse outcomes in ST elevation myocardial infarction (STEMI) and acute coronary syndrome (ACS). We postulate that intense inflammation precedes left ventricular systolic dysfunction which leads to the development of acute pulmonary oedema (APO). Hence, we aim to examine the association of admission NLR in STEMI or ACS with APO.

Methods: A chart review was carried out on 183 patients who were admitted to Penang General Hospital for clinical diagnosis of STEMI or ACS which comprises of Non ST elevation myocardial infarction (NSTEMI) and unstable angina (UA). Total and differential WBC counts were obtained from peripheral blood samples collected at admission.

Results: The study cohort was predominantly men (76%) with a mean age of 62 ± 13 years. Average NLR was 4.3 ± 7.3. There is a significantly higher NLR in patients with STEMI (n=48, 7.8 ± 12.8) compared to ACS (n=135, 3.0 ± 2.9); P<0.001. Similarly, among the 135 patients with ACS, NLR in patients with NSTEMI (n=49, 3.8 ± 3.7) was significantly higher than UA (n=86, 2.5 ± 2.2); P=0.016. Overall, patients who developed APO had a higher NLR compared to patients without APO ,6.2 ± 12.5 vs 3.6 ± 4.1; p=0.032. Patients diagnosed with NSTEMI-non APO reported the lowest NLR (2.8 ± 2.6), followed by NSTEMI-APO (3.9 ± 3.7), STEMI-non APO (6.6 ± 6.4) and STEMI-APO (9.6 ± 18.8); P<0.001 among the groups. It was also found that mean NLR of patients with STEMI-APO is significantly higher than patients with NSTEMI-non APO, p=0.001.

Conclusion: A more elevated value of NLR in STEMI shows that there is a more profound inflammation occurring within the ischaemic myocardium aiming to promote healing, as compared to NSTEMI. Besides, it is plausible that overwhelming inflammation as evidenced by relative neutrophilia and lymphocytopenia causes myocardial stunning resulting in heart failure. In short, this concept of myocardial inflammatory response may help to develop novel interventions to limit the inflammatory process and hence improve clinical outcomes in these patients.

FP4.1

THE UTILITY OF POINT OF CARE GENOTYPING TECHNOLOGY IN PATIENTS UNDERGOING PERCUTANEOUS CORONARY INTERVENTION: FIRST EXPERIENCE IN ASIA - A CASE REPORT

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Background: The CYP2C19*2 allele, the most common CYP2C19 loss-of-function allele, is associated with a higher rate of major adverse cardiovascular events, including following percutaneous coronary intervention (PCI). The Spartan Rx system (SpRx), a novel point-of-care genetic test that identifies CYP2C19*2 allele carriers within 1 hour, was shown to correctly select patients whose antiplatelet strategy was changed from Clopidogrel to Prasugrel, and subsequently shown to have adequate suppression of platelet aggregation.

Objective: To provide a case report of the first 2 patients who had an antiplatelet strategy, following PCI with drug eluting stent(s) (DES), based on SpRx.

Methology: Following successful PCI with DES, 2 patients underwent genotyping with SpRx, and then impedance aggregometry (Multiplate; MEA). Clinical decision-making on the pharmacotherapy strategy was made using the combined results.

Results: Patient 1: A 41 year- old Malay man, a smoker, had a NSTEMI in April 2011, eventually consented to conventional coronary angiography (CCA) on 06/12/2011. CCA showed significant disease at the LAD artery; he underwent ad hoc PCI with DES at the mid-LAD and prox-LAD segments. He had been on clopidogrel 75mg OD for 3 days when he underwent SpRx and MEA assessment on 06/12/2011. He was found to be CYP2C19*2 allele negative, and an MEA of 211 AU*min. Patient 2: A 65 year-old Chinese man, who had a myocardial infarction in March 2003, underwent CCA on 18/8/2011 for recurrence of angina. This demonstrated complete in-stent restenosis at the LAD (previously stented in 2003) but its distal segment well collateralized. However, there was progression of disease at the OM1 vessel, and he underwent elective PCI to OM1 with DES on 27/12/2011. He had previously been on adjunctive Clopidogrel 75mg OD for 3 months. He was found to have CYP2C19*2 allele positive (*1/*2) and a MEA of 466 AU*min. In view of this, the adjunctive antiplatelet was changed to from clopidogrel to prasugrel.

Conclusion: The SpRx system correctly identified the patient with higher platelet aggregometry values based on their CYP2C19*2 genotype. Used in combination with the MEA, it rapidly provides additional information to tailor antiplatelet pharmacotherapy in patients, especially those having PCI with DES.

FP4.2

QUALITY OF WARFARIN THERAPY IN MALAYSIAN PATIENTS. A SINGLE-CENTRE STUDY OF ITS STATUS AND INFLUENTIAL FACTORS

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Background: For patients on warfarin therapy, maintenance of time in the therapeutic range (TTR) is generally poor in most of countries, both shown in clinical trials and clinic practice data. In this study, we examined the status of and the factors influencing TTR in Malaysian patients receiving warfarin therapy from University of Malaya Medical Centre (UMMC). In RELY study, Malaysia centres achieved TTR of about 56%.

Methods: We randomly enrolled 83 patients attending warfarin clinic in UMMC, Kuala Lumpur. They received warfarin therapy for various indications. They had regular INR testing in 12 month period in year 2011. Data was collected on demographic characteristics, INR values, indications of warfarin therapy, use of anti-platelet, and co-morbidities.

Results: The mean age of 83 patients was 61 ± 13 (24-80) years. Males were 46%. Atrial fibrillation was the commonest indication for warfarin therapy (54%). Over the 12-month period, 419 INR values were available. TTR was 56 ± 29% (0-100%) for all patients. Among these patients, only 49.2% (41) of patients achieved TTR above 60%. On further correlation analysis, we found that TTR was not affected by age, gender, race or co-administration of anti-platelet.

Conclusion: The warfarin control in this group of patients was similar to that achieved in clinical trial. However, this value is still suboptimal as the international standard should be 60%. Other factors which potentially may influence the control should be examined, e.g. prescribing physician factor, co-administration of other interacting medications or traditional medicine, and frequency of INR checking.

FP4.3

CLINICALLY REVELANT NON-MAJOR BLEEDING IN STEMI, HOW BIG A RISK OF MACE?

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Background: In developing countries, fibrinolysis is the commonest choice of reperfusion for STEMI patients. Outcomes improved with the addition of aspirin and improved further by adding LMWHs and clopidogrel. Aggressive pre-fibrinolytic therapy is associated with a well documented increase in minor and major bleeds, additionally, there is also an increase in clinically relevant non-major (CRNM) bleeds. When this occurs in the immediate post STEMI period, all anti-platelets and LMWH have to be stopped. Is this cohort of patients at an added risk of MACE?

Objective:To determine the bleeding risk in STEMI patients who received aspirin, clopidogrel and LMWH prior to STK and the outcome in patients who developed clinically relevant non-major bleeding.

Method: 423 consecutive STEMI patients admitted to the CCU Hospital Kuala Lumpur, over 18 months (January 2009 - June 2010) were analysed. Before being admitted to the CCU, all STEMI patients were given a start dose of 300mg aspirin PO, 300mg clopidogrel PO and an equivalent of 0.6 ml of enoxaparin sc, followed by 1.5 megaunits of Streptokinase IV, in the Emergency Department. Patients who bled, were then classified as Minor, Clinically Relevant Non-Major (CRNM) and Major bleeding, based on the ISTH classification.

Results: 80 out of the 423 patients (18.96%) developed bleeding. CRNM bleeding was the commonest, 49% (n=39) followed by minor 30% and major bleeding 21%. Patients with CRNM bleeding had higher index hospitalization mortality compared to those with minor bleeding (12.82% vs 0%, p =0.0675). Patients who received < 48 hours of anti-platelets and LMWH post STEMI showed a higher mortality compared to those receiving therapy for > 48 hours. (22% vs 0%, p= 0.007). Incidentally, patients on fondaparinoux bled earlier compared to those on enoxaparin (median 4hrs vs 9.5 hrs), but was not statistically significant.

Conclusion:These findings demonstrate that aggressive anti-platelet and LMWH pre-treatment before STK results in significant CRNM bleeding in the post STK period, causing higher index hospitalization death rates. It also showed that those receiving < 48 hours of post STK anti-platelet and LMWH treatment had a significantly higher mortality.

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FP4.4

EFFECT OF EXTRACORPOREAL SHOCK MYOCARDIAL REVASCULARIZATION (ESMR) ON LEFT VENTRICULAR DYSSYNCHRONY

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Background: ESMR has been shown to improve symptoms and myocardial perfusion in patients who has severe coronary artery disease which are not amendable to revascularization. These patients often progress to end stage cardiac failure despite on optimal medical therapy. Only a minority of patients benefit from Cardiac Resynchronization Therapy (CRT) as it is very costly and the procedure is invasive. CRT works on the basis of correcting LV dyssynchrony which had been recognized as a prognostic marker in coronary artery disease. Our earlier experienced with ESMR showed it improved LV dyssynchrony in a few of our patients thus further study was performed to establish this important finding as this new modality of treatment is very safe and significantly cheaper.

Objectives: To assess the effect of ESMR on mechanical LV dyssynchrony.

Methodology: This is a retrospective cohort study involving 60 severe CAD patients which fulfill the inclusion and exclusion study criteria. Every patient received intensive standard medical therapy. 30 symptomatic patients were subjected for ESMR therapy and the remaining patients were identified as control group. Color-coded Tissue Doppler Imaging (TDI) echocardiography was performed to calculate Yu Index at baseline and was repeated 3 months apart for every patient in each group.

Results: At the end of the study, we have 18 eligible patients from ESMR group and 23 patients from control group. Using repeated measures ANOVA, there is a statistically significant difference in the mean Yu Index between 2 study groups [F(df)=9.858 (1,37), p=0.003)] after adjusted by DM status and age. ESMR group had significantly lower adjusted mean Yu index different compared to control group. (Adj. mean paired diff. = -13.16, 95%CI: -21.65, -4.67)

Conclusion: This study shown ESMR is an independent predictor factor for positive effect on LV dyssynchrony. This finding might potentially extend the indication of ESMR to benefit the severe heart failure patients but more studies with bigger sample size are needed.

FP4.5

EXTRACORPOREAL SHOCKWAVE MYOCARDIAL REVASCULARIZATION (ESMR) THERAPY: A NOVEL THERAPY FOR REFRACTORY ANGINA

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Background: With improvement in cardiovascular care, there is a rapidly growing group of patients who remain severely disabled by symptoms of myocardial ischaemia but yet not amenable to conventional revascularization therapy. ESMR is a shockwave therapy given to the area of ischaemic myocardium which theoretically induces angiogenesis and hence improvement in myocardial perfusion and clinical symptoms.

Objectives: To analyse the effect of ESMR in patients with refractory angina in improving angina symptoms and myocardial perfusion.

Methodology: 20 patients (85% with 3 vessels disease and 15% with 2 vessels disease) who fulfill these inclusion criteria:1.Patient with refractory angina 2.Presence of angina which cannot be controlled by medical therapy, percutaneous coronary intervention (PCI) or coronary artery bypass graft surgery (CABG) 3.Patients with Canadian Cardiovascular Society (CCS) angina class II to IV 4.Proven reversible myocardial ischaemia as shown by single photon emission computed tomography (SPECT) study 5.Patient was declined PCI or CABG by the attending cardiologist or cardiothoracic surgeonwere recruited and treated with ESMR 3 sessions per week for 3 cycles at intervals of 3 weeks. Each patient had total of 9 sessions with 500 shocks in each session. They were assessed clinically using CCS angina class, Seattle Angina Questionnaire (SAQ), exercise stress test (EST) and myocardial perfusion (16 out of 20 patients) before and 3 months after the treatment.

Results: There were significant improvement in CCS angina class (p-value < 0.001), angina symptoms based on SAQ (p-value = 0.008) and decreased in nitroglycerin usage (p-value = 0.02). An increased in the duration of EST was demonstrated (7.65 vs 9.99 minutes, p-value < 0.001) and correlated with an improvement in metabolic equivalent of task or METS (4.85 vs 6.17, p-value < 0.001). There was also improvement in defect extent score at stress on SPECT, pre and 3 months post ESMR treatment, 29.36 ± 9.75% and 24.63 ± 11.26% (p-value = 0.021) respectively.

Conclusion: We observed an overall improvement in both clinical symptoms and myocardial perfusion after ESMR therapy. This exciting novel therapy offers new hope in symptomatic CAD patients not amenable to conventional therapy.

FP4.6

ANTICOAGULATION IN LEFT VENTRICULAR THROMBUS: BEYOND INR MONITORING?

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Background: Warfarin therapy aiming for an INR of 2.0 to 3.0 is recommended for left ventricular (LV) thrombus. The influence of time within therapeutic INR range (TTR) and total anticoagulation duration remain uncertain.

Objectives: 1.Investigate optimal TTR and duration of anticoagulation for disappearance of LV thrombus. 2.Correlate optimal anticoagulation settings with short and long term outcomes.

Methodology: Patients with LV thrombus confirmed on serial 2D transthoracic echocardiography (2DE) or cardiac magnetic resonance (CMR) were enrolled and followed up for INR, LV thrombus, death, stroke, minor and major bleeding at 6 months and 12 months.

Results: 35 patients were enrolled between 2003 and 2011. Mean LV ejection fraction was 34.13 ± 15.11% at baseline. 85.7% had ischemic and 14.3% non-ischemic dilated cardiomyopathy. As ischemic cardiomyopathy was the major cause of severe LV dysfunction, 77.8% and 5.5% were also prescribed aspirin or clopidogrel respectively. After 6 months anticoagulation, 22.8% of LV thrombi disappeared. Those with at least 46% TTR had significantly greater disappearance of LV thrombi. Conversely, those with persistent LV thrombi had INR <2.0 56.52% of the time. By 12 months, 31.4% of LV thrombi had disappeared. Those with at least 57.27% TTR had significantly more disappearance of LV thrombi. Those with persistent LV thrombi had INR <2.0 49.62% of the time.Despite persistent thrombi at 6 months, another 25.7% (n=9) achieved complete resolution at 12 months. These patients had at least 61.7% TTR in the second half of the 12 months follow up period.Major bleeding within an INR range of 2.0 to 3.0 occurred in one patient (incidence 2%). Minor bleeding was more common (10 patients). No death or disabling stroke was reported.

Conclusion: When treating left ventricular thrombi, we recommend a stringent control of INR with > 60% of the time within the recommended therapeutic range of 2.0 to 3.0. This may translate into a 20% chance of disappearance of LV thrombi at 6 months and 30% at 12 months. LV thrombi will persist if INR <2.0 >50% of the time.

FP5.2

LEFT VENTRICULAR HYPERTROPHY AMONG HYPERTENSIVE PATIENTS IN PRIMARY CARE DETECTED BY ECHOCARDIOGRAPHY AND IMPACT ON CARDIOVASCULAR RISK STRATIFICATION

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Background: Left ventricular hypertrophy (LVH) is a strong predictor of cardiovascular morbidity and mortality in hypertensive patients. Epidemiological studies have shown that LVH is a risk factor for sudden death, ventricular arrhythmias, myocardial ischaemia, coronary heart disease and congestive heart disease. Electrocardiogram is a readily available tool in primary care but has a low sensitivity but high specificity for detecting left ventricular hypertrophy.

Objectives: To determine the prevalance of left ventricular hypertrophy detected by echocardiography and electrocardiography (ECG), and the impact it has on risk stratification.

Methodology: In this cross-sectional study, patients with hypertension in a primary care centre were assessed their risk factors. ECG and echocardiography were performed. ECG left ventricular hypertrophy (LVH) diagnosis was made by Sokolow and Cornell criteria. Echocardiography diagnosis of LVH was made by measuring left ventricular mass index. Framingham 10-year risk assessment tool was used for stratification of cardiovascular disease risk.

Results: Eighty-two patients were analysed with a mean age of 54.5 ± 9.9 with 37 male patients. The ethnic distribution was Malays 26.8%, Chinese 46.3%, Dayaks 21.9% and others 0.05%. Risk factors identified were obesity (54.9%), diabetes mellitus (54.9%), active smoking (7.3%), family history of ischaemic heart disease (17.1%), and dyslipidaemia (73.2%). There were significantly more patients detected with LVH by echocardiogram, 29.3%, compared to ECG, 13.4% (p=0.01). Electrocardiogram only had a sensitivity of 29.2% but specificity of 92.7% with an accuracy of 73.4% in detecting LVH. Detecting LVH significantly increases the cardiovascular disease risk in the study population with a mean 10-year risk of 18.98% versus 29.71% (p<0.005). Echocardiogram assessment significantly changes the cardiovascular disease risk stratification with 4 patients from low-risk became intermediate-risk and 6 patients from intermediate-risk to high-risk (p<0.05).

Conclusion: This study highlights the need to identify patients with left ventricular hypertrophy for risk stratification of hypertensive patients especially in the intermediate risk patients.

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FP5.3

EFFECTIVENESS OF HEALTH EDUCATION TALK IN CREATING AWARENESS OF ATRIAL FIBRILLATION: A COMMUNITY-BASED SURVEY

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Background: Atrial fibrillation (AF) is the commonest arrhythmia and a growing problem in health care. Estimated prevalence of AF is between 3-5% and a related 5-fold increase in risk of stroke. However, there is little data concerning the degree of awareness of AF in general population.
Objective: The aim of this study is to define the demographics differences in the extent of AF knowledge and creating awareness through AF education health talk.

Method: A total of 6 public health talks were given from September to December 2011. A survey questionnaire form was distributed during these talks. Preliminary questions on AF knowledge were asked followed by subsequent feedback after the health talk.

Results: Out of 526 participants, 158 (30%) completed the survey. The mean age was 53.6; gender (male 43.7%, female 56.3%) and race (14.6% Malay, 79.1% Chinese, 6.3% Indian). There were 41% participants who had heard about AF (pre-health talk) and about 50% knew that AF can cause stroke by forming clots in the heart. There were no significant differences between gender, race, hometown, income and internet access in the awareness and knowledge of AF except for education background ($P > 0.05$). A total of 57% responded to have moderate to significant increase in AF awareness post-health talk as shown in the significant increased in AF knowledge i.e. AF causing stroke, blood clots forming in the fibrillating heart and ECG diagnosis of AF ($P < 0.001$). 71.5% commented that the talk was relevant, easy to understand and meeting the right level. 79% would recommend the talk to help others to understand how to reduce the risk of stroke in AF.

Conclusion: Awareness and knowlege of AF was mainly influenced by education background.There was a significant success in creating AF awareness through public health education talk.

FP5.4

THE USE OF ACE INHIBITORS IN A MEDICAL OUTPATIENT HYPERTENSION CLINIC : A SINGLE CENTRE STUDY

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Background: Angiotensin-converting enzymes inhibitors(ACEIs) have been shown to have multiple benefits including sustaining a good 24 hour blood pressure control, reduction of proteinuria, retardation of chronic kidney disease progression, regression of LVH and therefore reduce cardiovascular related mortality. We had performed a short study in our centre to analyze the extent to which these medications were used.

Methods: This is a retrospective study involving all hypertensive patients attending general medical clinic HRPZII from 1st April to 30th April 2010. The data were collected from clinic notes. Patients with missing data and those who were on ARB or on both ACE-I and ARB were excluded. A total of 208 out of 214 patients were analyzed. All analyses were using PASW 18.0.

Results: One hundred and nine were male (52%). Mean age was 56.5 ± 12.6. One hundred and six were diabetics (50.9%). ACE inhibitors was prescribed to a total of 107(51.4%) patients. Patients who were on ACE-I had a significant lower creatinine and higher GFR compared to those who were not on ACE-I (mean creatinine/ GFR for ACE-I vs No ACE-I, 238umol/l /30ml/min vs 114 umo/l / 70 ml/min, $P < 0.001$). Only 48.1% (51 / 106 patients) diabetics were on ACE-I.Out of 139 patients with proteinuria (66% of study population) only 66 were on ACE-I (47.5%). With regards to LVH, only 66 out of 118 were on ACE-I (55.9%). 63.4% (33/52 patients) with evidence of Ischaemic changes on ECG were on ACE-I. In a small number of patients who had CT evidence of stroke, 42.8% (6 / 14 patients) were on ACE-I.

Conclusion: Despite the advantages using ACE-I in high risk hypertensive patients, its usage remained relatively low. The patients renal function may be a major obstacle preventing the usage. A more detailed study and design will be needed to confirm this.

FP5.5

EFFECTIVENESS OF PHYSICAL TRAINING IN LIMITED SESSIONS OF CARDIAC REHABILITATION PROGRAM HOSPITAL SERDANG EXPERIENCE

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Introduction: Cardiac rehabilitation and secondary prevention programs (CRP) are recognized as integral to the comprehensive care of patients with coronary heart disease. The program has been shown a significant impact in patients quality of life. However the CRP in Hospital Serdang has been modified to 6 weeks program to adapt with limited resources and patients convenience to participate into the program.

Objective: To evaluate the effectiveness of physical training in Cardiac Rehabilitation Program with limited exercises training schedule. Design: Prospective cohort study. Setting: Patients were selected from Medical Rehabilitation Department Hospital Serdang who had attended for Phase I, Phase II and Phase III Cardiac Rehabilitation Program.

Patients and methods: Patients who completed Phase I, Phase II and Phase III Cardiac Rehabilitation Program from January 2010 till December 2010 were enrolled in this study. Outcome measure: Standardized 6 minutes Walk test (6MWT) and Rating Perceived Exertion (RPE)

Results: A total of 62 patients were enrolled in this study with a mean age of 53.42 ± 9.66 year old. Majority were male (83.9%) and more than half (58.1%) had received at least secondary education. The mean of 6MWT at Phase 1 (383.45 ± 61.4), Phase II (426.50 ± 65.9) and Phase III (453.23 ± 66.1) of CRP comparatively have shown significant improvement ($p < 0.005$). However, there were no significant improvement of RPE comparing during Phase I with Phase II and Phase III

Conclusion: 6 weeks program of CRP has been shown a significant improvement in physical performance of the patients with coronary heart disease. Therefore, limited scheduled of physical training complimented with home exercise program and adequate education session, can be implemented in any limited resources cardiac rehabilitation center.

FP5.6

PROPORTION OF CORONARY ARTERY DISEASE WHICH IS NOT AMENABLE TO REVASCULARIZATION IN A TERTIARY HOSPITAL IN MALAYSIA IN THE YEAR 2010

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Background: Despite advancements in drug therapy and revascularization procedures, there remain a group of Coronary Artery Disease (CAD) patients with antomically severe disease which is not amenable to revascularization. Very few estimates are available worldwide for prevalence of CAD which is not amenable for revascularization. No study on a Malaysian population is reported till date.

Objectives: To estimate the proportion of CAD which is not amenable to revascularization in the year 2010 in a tertiary hospital in Malaysia.

Methods: This was a retrospective study. We reviewed all the angiograms done at University Malaya Medical Centre (UMMC) in the year 2010. The total number of patients who were deemed unsuitable for revascularization after the initial angiogram or after assessment by the cardiothoracic surgeon were determined. We analyzed the associated risk factors, angiographic findings, severity of symptoms, medical therapy, clinical outcome and reasons for unsuitability for revascularization in this group of patients. We further compared this group with a control group which was taken randomly from patients who underwent revascularization

Results: The proportion of CAD not amenable to revascularization in University Malaya Medical Centre in the year 2010 was found to be 3.8 percent of the total number of angiograms with obstructive CAD. Patients whose disease was not amenable to revascularization were found to be older and had a higher prevalence of diabetes as compared to patients who underwent revascularization.Mean ages were 62 ± 10.6 years versus 58± 9.9 years respectively(p value = 0.023) . Prevalence of diabetes was 79.5% versus 40% respectively (p value <0.001). The rates of re hospitalization and mortality in one year was significantly higher in patients who were unsuitable for revascularization as compared to revascularized patients. Rates of re hospitalization were 21% versus 8% respectively (p value = 0.03). Mortality rates were 16 % versus 2% respectively (p value= 0.02). Diffuse CAD involving a single or multiple coronary arteries was found to be the commonest reason for unsuitability for revascularization.

Conclusion: The proportion of CAD not amenable to revascularization in University Malaya Medical Centre in the year 2010 was 3.8 percent of the total number of angiograms with obstructive CAD. This value is lower as compared to the few other available western studies. The significant risk factors for CAD not amenable to revascularization were older age and diabetes. Patients who had CAD not amenable to revascularization had a higher rate of re hospitalization and mortality compared to patients who were revascularized

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FP5.7

PREVALENCE OF CARDIOVASCULAR RISK FACTORS IN SARAWAK: COMPARISON BETWEEN LIFECARE-M AND NHMS III

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Background: Population studies look at the trend of diseases, provide indicators on the health status of our nation and assess the success of past programs. The third National Health and Morbidity Survey (NHMS III) was conducted in 2006, which included 4966 respondents from Sarawak (including infants and the elderly). The Malaysian cohort of the LifeCARE study (LIFECARE-M) was started in 2010, recruiting subjects from an urban and rural setting in Sarawak, Malaysia. Among thethe risk factors studied include hypertension, diabetes mellitus, hypercholesterolemia, being overweight or obese and also abdominal obesity.

Objective: To compare prevalence of cardiovascular risk factors between NHMS III and data from LIFECARE-M.

Methodology: Data on established cardiovascular risk factors were obtained from the LIFECARE-M was analyzed then compared to the NHMS III figures.

Results: A total of 2529 subjects were recruited between the age of 18 to 49 years, with 1055 men and 1474 women (male 41.7%, female 58.3%). Of the total, 2279 were from urban setting and 250 from rural setting. Mean age for respondent is 35.3 years with standard deviation of 8.0 years. The respondents demographics are slightly different compared to NHMS III (age 41.3 ± 14.5 years, 47.1% male, 52.9% female). In LIFECARE-M, the prevalence of hypertension is 18.5% (95% CI: 15.0 22.1%), lower than the national prevalence of 32.2%. Prevalence for diabetes mellitus , 9.3% (95% CI: 5.6-13.0%), obesity, 16.4% (95% CI: 12.8-20.0%) and hypercholesterolemia, 19.7% (95% CI: 16.2%-23.2%) are similar to those in NHMS III. On the other hand, the prevalence of overweight subjects, 33.4% (95% CI: 30.2-36.6%) and abdominal obesity, 34.3% (95% CI: 21.3-41.9%) are higher than the national prevalence.

Conclusion: With the exception of the prevalence of overweight and abdominal obesity, our study noted prevalence rates of cardiovascular risk factors that are similar or lower compared to the national prevalence rates as surveyed in 2006. Results may confounded by the difference in age range of the respondents. However the trend of increased rates of excess body weight is also supported via review of recent local data

FP6.1

PROSPECTIVELY ECG-TRIGGERED HIGH-PITCH SPIRAL ACQUISITION USING 2ND GENERATION DUAL SOURCE CORONARY CTA: THE HOSPITAL SERDANG EXPERIENCE

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Background: CCTA is an established imaging modality to screen patients with low to moderate risk of CAD. This is however associated with some radiation exposure. With the recent acquisition of the latest second generation dual source CT, the potential to minimize the radiation exposure needs evaluation.

Objectives: We evaluate the feasibility of a new scan mode for CCTA with a low effective dose.

Methodology: In 48 consecutive patients (heart rate < 70 bpm and in sinus rhythm, CCTA was performed using a dual-source CT system with 2 x 128 x 0.6 mm collimation, 0.28s rotation time, a pitch of 3.4, 80/80, 100/100 or 120/120 kV tube voltage, 370 mAs/rot, 0.6 mm reconstructed slice width, 0.3 mm reconstruction increment with a single segment reconstruction temporal resolution of 75 ms. Data acquisition was prospectively triggered at 55% of the R-R interval and completed within one cardiac cycle.

Results: In 47 (98%) patients the imaging was successful and of diagnostic quality. 29 Male (60%) and 19 female (40%) patients were scanned. There were 24 (50%) Malay, 13 (27%) Chinese and 11 (23%) Indian patients. The mean age was 51.8 ± 11.1 years, weight was 70.7 ± 13.8 kg (45.6 - 108.0 kg), heart rate was 64.1 ± 11.5 bpm (46-102 bpm). The calcium score was 53.6 ± 100.3 with 12 (48%) patients having score of 0 (0 - 389). 80 kV tube voltage was used in 14 (29%) patients, 100 kV in 30 (63%) patients and 120 kV in 4 (8%) patients. The dose-length product was 96.9 ± 26.3 mGy cm (58-163 mGy cm). The effective dose was 1.66 ± 0.93 mSv (0.81 6.55 mSv) with 4 (8%) patients < 1 mSv. For tube voltages of 80 kV, 100 kV and 120 kV, mean radiation was 1.05 mSv, 1.758 mSv and 2.9085 mSv.

Conclusion: In patients with a low and stable heart rate, prospectively ECG-triggered high-pitch spiral CCTA provides diagnostic quality image at a consistently low effective dose.

FP6.2

PREVALENCE OF LEFT VENTRICULAR THROMBUS IN PATIENTS UNDERGOING CARDIAC MAGNETIC RESONANCE IMAGING IN HOSPITAL SERDANG, MALAYSIA.

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Background: Detection of left ventricular thrombus is of great importance as the thrombus is a substrate for thromboembolic events. Its detection and hence anticoagulation is important to reduce further insult in an already compromised heart.

Objective: To assess the prevalence of incidental left ventricular thrombus found in patients undergoing myocardium viability studies with cardiac magnetic resonance imaging (MRI) that were not detected on routine transthoracic echocardiogram.

Methodology: All consecutive 130 patients who underwent a cardiac MRI for viability studies from January to December 2011 were screened for possible undetected left ventricular thrombus, previously not picked up on routine transthoracic echocardiogram. These patients underwent cardiac MRI using the Siemens 1.5 Tesla Symphony machine for viability studies post coronary angiography, prior to further intervention either Percutaneous Coronary Intervention, Coronary artery bypass surgery or medical management. All these patients also underwent a routine trans-thoracic echo to assess their cardiac function and to look for presence of LV thrombus.

Results: Mean age of patients was 55.4 ± 9.47 years. There were 111 males (85%) and 19 females (15%). 11 patients (8.5%) had LV thrombus. All the 11 patients who had LV thrombus were male and had hyperlipidemia. Though a high percentage (72.37%) of the patients with low EF (<40%) had LV thrombus, this did not reach significance levels. There was no significant correlation between age, sex, EF or co-morbidities with the presence of LV thrombus.

Conclusion: No obvious correlation was found between the presence of LV thrombus and the various parameters used in this study. Thus, all patients undergoing viability studies should be screened for LV thrombus especially higher risk patients such as males with hyperlipidemia with low EF. It is imperative to pick up the presence of thrombus so that anti coagulation may be commenced to prevent further morbidity such as stroke and other atherothromboembolic events.

FP6.3

2ND GENERATION DUAL SOURCE CORONARY CTA: THE HOSPITAL SERDANG SERIES

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Background: The latest second generation dual source CT is being widely used for coronary assessment. Several different protocols have been used on patients based on clinical parameters. With different protocol, patients were exposed to different radiation exposure.
Objectives: We review all patients who underwent CCTA with different protocol and focus on exposure.

Methodology: In 574 consecutive patients, CCTA was performed using a dual-source CT system with 2 x 128 x 0.6 mm collimation, 80/80, 100/100 or 120/120 kV tube voltage and 0.6 mm reconstructed slice width. Different protocol was used for data acquisition; based on patients clinical background, heart rate, body weight and chest wall thickness.

Result: SA total number of 574 (93.2%) patients were successfully acquired CT imaging and of good diagnostic quality. 59 patients had only calcium scoring while other proceeded with CCTA according to individual protocol. 48 patients underwent Flash protocol and received radiation ranging from 0.74 mSv to 6.55 mSv, with average of 1.66 mSv. For tube voltages of 80 kV, 100 kV and 120 kV, average radiation was 1.05 mSv, 1.76 mSv and 2.91 mSv. 330 patients underwent step and shoot protocol and received radiation ranging from 0.27 mSv to 16.58 mSv, with average of 5.63 mSv. For tube voltages of 80 kV, 100 kV and 120 kV, average radiation was 3.18 mSv, 5.52 mSv and 8.36 mSv. 46 obese patients underwent XXL protocol and received radiation ranging from 2.55 mSv to 22.76 mSv, with average of 11.28 mSv. 44 bypass patients had their bypass graft study. 37 patients had post PCI stent assessment. Nine patients had emergency triple rule out scan.

Conclusion: Different protocols, determined by patients clinical parameters caused different level of radiation exposure. Exposure of radiation on patients who underwent CCTA might be reduced with a proper patient and protocol selection. With further experience and training, reduction of radiation exposure is achievable.

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FP6.5

NON-CARDIAC FINDINGS IN PATIENTS UNDERGOING CARDIAC MSCT IN HOSPITAL SERDANG

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Background: Cardiac Multi Slice Computed Tomography (MSCT) is a method to detect coronary artery stenosis and assess cardiac function and morphology. Non-cardiac structures imaged together can be studied in the same sitting. This allows structures like lungs, mediastinum, kidney and liver to be assessed in the same acquisition with minimal radiation exposure.

Objective: This study investigated the frequency of non-cardiac findings in patients undergoing cardiac MSCT in Hospital Serdang. The frequency of non cardiac CT findings was compared to multiple parameters.

Methodology: 515 consecutive patients underwent cardiac MSCT for suspected coronary artery disease from December 2010 until December 2011 using the 128 dual source Siemens MSCT machine. The cardiologists assessed the coronaries and the radiologists assessed the presence of incidental extra- cardiac findings. The findings were further divided into significant findings that required further investigations and non significant findings.

Results: There were 321 (62%) males and 194 (38%) females. Mean age was 53.01±11.94 years. 79 (15.34%) patients had extra-cardiac findings. Among the patients with extra-cardiac findings, 75 (14.6%) had mild disease and 4 (0.8%) had severe disease. There was significant positive correlation between age of the patients with spine changes (p=0.04) and the presence of calcified aorta (p=0.03). Also noted positive correlation between patient having diabetes mellitus and the presence of liver cysts, renal cysts, bladder calculi and fatty liver (p=0.013).

Conclusion: There is a high incidence of incidental extra-cardiac findings in patients undergoing MSCT, and the assessment of these findings may be done without much difficulty. We conclude that patients undergoing MSCT should have their extra-cardiac findings assessed in the same setting, especially elderly and diabetic patients. This is so that significant co-existent extra-cardiac findings may be detected early and managed accordingly.

FP6.6

THE IMPORTANCE OF INTRA-PROCEDURAL TRANSESOPHAGEAL ECHOCARDIOGRAPHY IN DETERMINING THE SUCCESS OF PERCUTANEOUS MITRAL LEAFLETS EDGE-TO-EDGE REPAIR FOR MITRAL REGURGITATION

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Background: The feasibility, safety, efficacy and mid-term durability of percutaneous edge-to-edge repair of the mitral leaflets for hemodynamically significance mitral regurgitation had been widely studied. To date, informations pertaining to the ideal location for mitral clip placement remain scarce.

Objectives: We aim to study the ideal location for mitral clip placement that maximumly reduces the mitral regurgitation, with minimum negative impact on transmitral mean pressure gradient and mitral valve area . We also evaluate the mitral valve anatomy and pathology that predict placement of more than one mitral clips.

Methodology: We prospectively screened patients with mitral regurgitation of at least grade 3 and above. Transesophageal echocardiography (TEE) was performed to assess the suitability for mitral clip repair. All the inclusion and exclusion criteria were as stated at EVEREST trial, except 1 patient was of chronic rheumatic heart disease(with pre-mitral clip procedure mitral valve area of 6.5cm2).TTE, NT-proBNP, 6 minutes walk test (6MWT), New York Heart Association (NYHA) status and SF 36 quality of life questionnaires were assessed before and after procedure at day 1, month 1,3,6 and 12.

Results: Seven consecutive patients (5 males), mean age of 59 ± 7 years old, with mitral regurgitation of grade 4 (except one patient with mitral regurgitation of grade 3) underwent successful percutaneous Edge-to-edge repair of mitral regurgitation. Majority being degenerative (4 patients), with remaining 2 patients of functional and 1 patient of rheumatic heart disease in etiology. All patients achieved procedural success with MR reduction to grade < 2+ immediate post-procedural. All patients received one mitral clip implantation,except 3 patients with 2 clips.One patient with flail P2 segment who had had successful MR reduction from 4+ to 1+ post-procedure ,after one clip deployment at the tip of flail P2 segment.Unfortunately he had recurrence of MR of 3+ on Day 1 postprocedure with the mitral clip insitu, with no new flail segment seen.One patient with MR of 4+ due to rheumatic heart disease had reduction of MR to grade1+ after one clip deployment at A2/P2 (nearer to A1/P1: lateral segment), without significant elevation of transmitral mean pressure gradient suggestive of mitral stenosis.

Conclusion: Percutaneous edge-to-edge repair of mitral leaflets in highly selected patients is a feasible options for mitral regurgitation patients who refused conventional surgical repair or replacement. As this technology is rather new, there is scarce information on the ideal spot for mitral clip placement, except general recommendation to place the clip at the central of A2/P2 segment or at the PISA of mitral regurgitation. From our limited experience on 7 consecutive patients with MR >3+, we observed that optimum results could be achieved (maximum MR reduction , with minimum elevation of transmitral mean pressure gradient) if we could successfully fix/approximate the pathology site (tip of flail segment in degenerative valve, or edge of retracted in-rolling edge of rheumatic leaflet) to the opposite normal segment. One interesting finding is that two clips were probably more likely to produce longer durable MR reduction in degenerative valve with flail segment.

FP6.7

AUDIT OF MULTI-SLICE COMPUTED TOMOGRAPHY OF THE CORONARY ARTERIES (MSCT) OF A NEWLY ESTABLISHED CARDIOLOGY CENTRE: A 16-MONTH EXPERIENCE.

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Background: MSCT , a non-invasive method of evaluating coronary arteries and complement conventional coronary angiogram (COROS). MSCT reconstructs coronary arteries, to provide complementary investigations of coronary artery disease.

Objectives: This study aims to identify the outcome and demographic profile of patients who have undergone MSCT.

Methology: This is a retrospective, observational study conducted in a newly established Cardiology Centre. Data was collected using an audit form and was analysed using Microsoft Excel 2007.

Results: 64 patients underwent MSCT in 16 months since September 2010. Majority were male. In the first arm, 62.5% underwent EST (Exercise Stress Test) prior to MSCT. 70% showed positive MSCT results, spread equally among the 40-49, 50-59, 60-69 age groups. Majority had ≥3 risk factors. 60.7% had medical treatment post-MSCT, while 35.7% had COROS. 64.3% were on antiplatelets before MSCT. In the same arm, 30% showed negative MSCT result. Majority were between 50-59 years, with 2 risk factors. 66.7% had medical treatment post-MSCT while 33.3% underwent COROS thereafter. 41.7% were on antiplatelets before MSCT. In the second arm, 24 had no EST done prior to MSCT. 66.7% showed positive MSCT. Majority were within 50-59 years old, with ≥3 risk factors. 37.5% had medical treatment post-MSCT, while 37.5% had COROS. Majority were on antiplatelets. 33.3% with negative MSCT mostly aged 40-49 with 2 risk factors. 75% had medical treatment post-MSCT while 12.5% had COROS. While 37.5% where on antiplatelets before MSCT 37.5% were never on antiplatelets.

Conclusion: EST before MSCT indicated no influence on CT positive results. However, having ≥3 risk factors predict positive CT. Of the CT positive results, majority were medically treated post-MSCT. This follow-up practice needs to be studied and analysed.

FP6.8

CMR T2* LEVELS IN THALASSEMIA PATIENTS: A HOSPITAL SERDANG EXPERIENCE

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Background: Death for most thalassemia patients is due to cardiac iron overload and subsequent heart failure. T2* is a method via Magnetic Resonance Imaging (MRI) where iron load in the heart can be calculated. Low T2*levels have been directly linked to mortality in thalassemics.

Objective: To find the association between T2* levels with various parameters such as age, sex, duration on chelation drugs, single or dual drug therapy and frequency of blood transfusions.

Methodology: 12 consecutive thalassemia patients from Hospital Ampang underwent cardiac MRI at Hospital Serdang from July to August 2011 using the 1.5 Tesla Siemens Symphony MRI. The T2* levels were read by 2 independent observers and compared with the patient demographics, ferritin levels and treatment regime.

Results: Age of patients was 29.66 ± 9.78 years (Mean +/-S.D.). T2* level was 17.64 ± 13.11 (Mean +/- S.D.). Ferritin level was 8167.41 ± 4761. 3 patients were males (25%) and 9 females (75%). 9 were Malays (75%) and 3 (25%) Chinese. 5 patients had no iron loading (33.3%), 2 patients (16.7%) had mild iron loading and 6 (50%) had severe iron loading. Only one patient (8.3%) was using single agent and 11 patients (91.7%) were on double agents.There was significant reverse correlation between Iron Loading and T2*(Rho=-.91; p<0.001). No significant correlation between age, sex, race and transfusion frequency was found (p>0.05). Significant reverse correlation between T2* and ferritin levels (rho=-.79; p=0.002) was noted. There was also significant reverse correlation between duration of Desferoxamine and T2*(rho=-0.5; p=0.04) while no significant correlation was noted between T2* and Deferipone use (p=0.1).

Conclusion: T2* levels have been shown to have a significant reverse correlation with ferritin levels and length of treatment with desferoxamine. Treatment with deferipone did not show a similar relation. This however needs to be further evaluated in larger studies. Ferritin levels may be used as surrogate marker for T2* levels and an indicator for monitoring of treatment. Chelating agent desferoxamine increases T2* levels and may confer survival benefits to the patients.

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YIA 1

LONG TERM OUTCOMES AFTER PARTIAL REVASCULARIZATION OF TRIPLE VESSEL CORONARY ARTERY DISEASE

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Background: CABG is recommended for complex triple vessel disease. Because of long surgical waiting lists, many patients had partial revascularization with PCI. Despite high procedural success rates, long term outcome remains uncertain.

Objectives: Compare long term outcomes of partial revascularization (PV) versus optimal medical treatment (MT) for triple vessel disease.

Methodology: Patients were enrolled and followed up for a minimum of 5 years looking at clinical status (NYHA, CCS), transthoracic echo (LV function and dimensions), prescriptions and MACE (MI, stroke, death).

Results: 217 patients (106 PV, 111 MT) were enrolled between 2002 and 2006. Due to intractable angina, 19 MT patients crossed over to PV. Another 4 underwent CABG. 24 PV patients (16.1%) had viability studies using cardiac MR (CMR) to guide revascularization. Mean number of lesions treated was 1.58 ± 0.788, 82.8% stents were >2.5mm diameter and 54% were DES. In the PV group, 16.1% undergone balloon angioplasty and 62.7% had stenting done in which 9.2% had significant residual stenosis. More patients deteriorated in NYHA class in the MT (28.8%) than PV (7.1%) group. CCS class worsened in 32.3% of MT versus 6% of PV patients. CCS improved in 12.1% of PV patients. Differences between groups were statistically significant (Chi square, p<0.05).Changes in functional status were matched by echo parameters. In the MT group, LVEF, EDV and ESV declined (p<0.001) from baseline (52%, 121ml, 103ml) to 5 years (39%, 183ml, 135ml). Corresponding measurements in the PV group showed improvements (p<0.001) from baseline (55%, 146ml, 65ml) to 5 years (60%, 108ml, 51ml). LV changes occurred early, within first 3 years. There was no difference in MACE (death, MI, stroke) between the 2 groups. 0.1% peri-procedural mortality was reported in the PV group. 5 years mortality for MT group was 2.72%. PV group had a TVR of 5.66% (6 CABG, 18 repeated PCI). No CMR viability guided PV required repeated procedures. MT patients had more hospitalization (ACS or heart failure), new onset arrhythmias and LV thrombus. Beta blocker and nitrate dosages increased in MT patients. However, differences between groups were not statistically significant.

Conclusion: In triple vessel disease with no option for CABG, compared to optimal medical therapy, partial revascularization with PCI appears beneficial at preserving NYHA and CCS class as well as improving LV dimensions and function.

YIA 2

CONTRAST INDUCED NEPHROPATHY PROPHYLAXIS IMPROVES ACUTE RENAL TUBULAR INJURY IN DIABETIC PATIENTS WITH STAGE 3 & 4 CHRONIC KIDNEY DISEASE UNDERGO ELECTIVE CORONARY ANGIOGRAM.

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Background: Serum Neutrophil Gelatinase-Associated Lipocalin (NGAL) has been shown to be a novel biomarker due to its increased specificity and sensitivity for the detection of acute kidney injury. Studies done in patients undergoing coronary angiogram show that serum NGAL level peak 4 hours after the administration of a contrast agent as opposed to the much slower 24 to 48 hours it takes for serum creatinine to rise before a diagnosis of contrast induced nephropathy (CIN) can be made. CIN prophylaxis remains a hotly studied topic in nephrology and cardiology literature. Optimal methods for CIN prophylaxis remain open for debate with studies suggesting variable outcomes for the current most widely practised methods (intravenous hydration and N-acetylcyctein). Using serum NGAL as a marker, we aim to uncover the incidence of CIN as well as evaluate the effects of a CIN prophylaxis strategy on a population of diabetic patients with moderate to severe chronic kidney disease (CKD) undergoing elective coronary angiogram in Cardiology Unit University Malaya Medical Centre.

Objectives: 1.To evaluate serum NGAL as an acute clinical marker for CIN post coronary angiogram in stage 3 & 4 diabetic CKD patients. 2.To demonstrate the effect of CIN prophylaxis in reducing serum NGAL level for stage 3 & 4 CKD diabetic patients undergoing elective coronary angiogram.

Methodology: This is a prospective study of 50 consecutive patients who fulfilled the following inclusion criteria: 1. Elective admission for coronary angiogram. 2. Stage 3 & 4 diabetic CKD. Estimated gromerular filtration rate (eGFR) was obtained via the MDRD equation. 3. Decision of CIN prophylaxis is based on cardiologist discretion. 4. Not on nephrotoxic drug 48 hours prior to the study. The blood samples were taken at 0H; 4H and 24H post coronary angiogram and sent for serum creatinine (sCr) and NGAL measurement using Alere Triage® NGAL Test (point-of-care fluorescence immunoassay for the rapid, quantitative determination of NGAL). CIN is defined as a 25% increase in sCr or an absolute increase in sCr of 44micromol/L relative to pre-contrast values.

Results: We measured serum NGAL and creatinine before, 4 and 24 hours post coronary angiogram for a total 50 patients. Out of the 50 samples taken, 38.0% received intravenous saline infusion and oral N-acetyl-cysteine (NAC) for CIN prophylaxis based on their baseline serum creatinine level. Mean age of the patients was 66.7 years with mean estimated GFR of 45.2 mls/min (MDRD equation). There was a significant raised of serum NGAL 4 hours t(49) = -2.51 (P < 0.0005) after contrast administration in 46% of the patients suggesting presence of tubular injury despite the absence of raised serum creatinine. However the magnitude of of NGAL increment was significantly lower in the goups receiving CIN prophylaxis , suggestive protective effect of prophylaxis.

Conclusion: Patients who received CIN prophylaxis had lesser magnitude of tubular injury. This finding is important, as preventing subacute CIN will further preserve kidney function and preventing mortality and morbidity related to kidney injury.

YIA 3

ANTIPLATELET LOADING COMBINATIONS IN MALAYSIAN PATIENTS PLANNED FOR ELECTIVE PERCUTANEOUS CORONARY INTERVENTION PHARMACODYNAMICS, PHARMACOKINETICS, GENOMICS AND IN-HOSPITAL CLINICAL OUTCOMES.

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Background: Clopidogrel and Aspirin is a typical antiplatelet loading combination (ALC) in patients planned for percutaneous coronary intervention (PCI). The effect of different ALCs on platelet aggregation (PA), antiplatelet drug levels (ADL) and in-hospital clinical outcomes (ICO) have not been conclusively determined in Malaysians planned for elective PCI.

Objective: To profile ALCs, study their effects on PA and ADLs, genotype allelic variants of the CYP2C19 enzyme in patients pretreated with clopidogrel, and assess ICOs.

Methodology: From 323 consecutive patients screened between 18/10/2010 to 14/03/2011, 237 were enrolled. PA, and drug resistance were determined by impedance aggregometry (Multiplate)(MEA); aspirin and clopidogrel carboxylic acid metabolite (CCAM) levels by LC-MSMS method, and genotyping for CYP2C19 variants by PCR-RFLP method.

Results: All patients were on Aspirin ≥ 75mg for ≥ 2 days. 4 main patterns of Clopidogrel loading were identified: Group 1: Clopidogrel 75mg daily ≥ 3 days (n=20); Group 2: Clopidogrel 75mg daily ≥ 4 days (n=118); Group 3: Clopidogrel 300mg ± 75mg (n=12); Group 4: No Clopidogrel (n=87). Mean levels of PA and plasma levels for Aspirin in Groups 1-4 were similar. In Groups 1-3, PA to Clopidogrel was, 376.25±153.664, 288.91±159.392, 347.33±195.706 AU*min, respectively (p=0.02 between Groups 1 vs 2; otherwise p=NS); and CCAM levels were 726.23±778.859, 981.12±1113.307, 2001.59±2432.835 ng/ml, respectively (p<0.05 between Groups 1 vs 3, and Groups 2 vs 3). CCAM and Clopidogrel MEA levels were not significantly correlated. Overall, by MEA, 1.7% patients were considered resistant to Aspirin and 10.1% resistant to Clopidogrel; with 2 patients resistant to both drugs. 37% of patients pretreated with clopidogrel had wild type CYP2C19 genotype (*1/*1), the remainder having at least one of *2 or *3 alleles (variant group). Prevalence of variant group was highest (71.1%) amongst Chinese patients. There was one case of in-hospital myocardial infarction.

Conclusion: The most common ALC was Aspirin ≥ 75mg daily ≥ 2 days and Clopidogrel 75mg daily ≥ 4 days. Antiplatelet effect of clopidogrel was most effective in this of 4 ALC groups. Clopidogrel resistance was 5.9X more common than Aspirin resistance. The majority of patients had ≥ 1 variant allele of the CYP2C19 genotype. PA and ADLs did not appear to affect ICOs.

YIA 4

LEFT ATRIAL VOLUME INDEX: ITS MEASUREMENT AND ASSOCIATION OF OUTCOMES IN PATIENTS WITH ACUTE CORONARY SYNDROME

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Introduction: Cardiovascular disease is the commonest cause of mortality and morbidity in Malaysia and also worldwide. It has shown that measurement of Left atrial volume index (LAVI) can prognosticate survivors of the event. However the significance of LAVI in Acute Coronary Syndrome (ACS) population has not yet been studied .

Objectives: To determine whether an increased LAVI is a predictor of major adverse cardiovascular events (MACE) and other cardiac outcome in patients with ACS. We also compare LAVI with left atrial (LA) volume and diameter for a predictor of MACE.

Methods: A prospective observational study of patients admitted to PPUKM with ACS was carried out between December 2010 to February 2011. Clinical data and echocardiographic parameters were prospectively collected in all patients that met all the criterias. LA size was assessed with biplane LA volume, from four-chamber and two chamber view of the LA area and M-mode. Patients were divided into two groups, normal LAVI ≤ 32 mL/m2 and increased LAVI > 32 mL/m2. The primary endpoint was MACE (Angina, Heart Failure, Re-infarction, Re-vascularization, Death and other cardiac outcomes such as atrial fibrillation). These patients then prospectively followed up for six months.

Results: Out of 75 patients that were included in the study, 43(57%) were readmitted for Cardiovascular events with 23 (72%) of them has an increased LAVI (p = 0.013). Higher incidence of admission for angina followed by congestive cardiac failure and re-infarction . All three LA size parameters were independently predictive for MACE (LAVI p < 0.001, LAV p < 0.001 and LAD p < 0.003). The overall performance for the prediction of MACE was greatest for LAVI, (LAVI 0.76; LAV 0.71; LAD 0.69). The best cut-off for LAVI in the overall measurement 25.5mL/m2 predicted MACE with 75% sensitivity and 60% specificity. Multivariate analysis showed that LAVI and previous history of congestive cardiac failure (CCF) is the only predictor for MACE in this study (p=0.030, Odds 1.229; p=0.031, Odds 5.437 respectively).

Conclusion: Increased LAVI is a powerful predictor of MACE after ACS and could emerge as a simple and important tool for risk stratification and as a guide for future surveillance and therapy in acute coronary syndrome.

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YIA 5

COMPARISON OF RESPONDER RATE AND LONG-TERM PROGNOSIS OF HEART FAILURE PATIENTS WITH DIFFERENT QRS DURATIONS AFTER CRT DEVICE IMPLANTATION

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Background: Cardiac resynchronisation therapy (CRT) is proven effective in reducing morbidity and mortality in patients with impaired left ventricular systolic function. In particular, CRT is effective in heart failure patients with evidence of electrical dyssynchrony as demonstrated by widened QRS complexes on ECG. It is, however, still unclear that whether heart failure patients with narrow QRS complexes on ECG would benefit from this form of electrical resynchronisation. There is some evidence in existence pointing to the fact that CRT itself might be proarrhythmic and hence may increase the mortality rate for those patients who do not respond to this form of therapy.

Objectives: We sought to investigate the causal relationship between CRT responders and non-responders with regards to their QRS durations, along with the mortality data.

Methods: This is a retrospective study of 206 patients from the year 2001 to 2011 who had been diagnosed with heart failure as evidenced by impaired left ventricular systolic function < 35% in NYHA class II-IV. This cohort is then categorized into responder and non-responder groups. Responder status is defined echocardiographically as improvement in end-systolic volume of > 15% from baseline, either at 6 or 12 months post CRT device implantation. Further analysis is done by subdividing them into different QRSd groups.

Results: The min age for this cohort is 55.9 ± 10.8 years. There are more male (86.2%) than female patients (13.8%). A great majority of this cohort (78.6%) received CRT-D devices while the rest (21.4%) had CRT-P devices. There are 112 responders and 94 non-responders, and this translates into a overall responder rate of 54.4%. There are 80 patients with QRSd < 120ms and 37 (46.3%) of them are responders. There are 73 patients with QRSd > 150ms and 43 (58.9%) of them are responders. The rest of the cohort (53 patients) have QRSd between 120ms to 150ms and 32 (60.4%) of them are responders. 91 (81.3%) responders are still alive whereas 68 (72.3%) non-responders are still alive. The responder group of patients have a clear survival advantage as shown with the Kaplan Meier curve (p=0.008). However, there is no statistical significance of survival rate when different QRSd groups are compared in the responder cohort. Likewise, no statistical significance in terms of survival when different QRSd groups are analysed in the non-responder cohort, although it is shown that patients with QRSd <120ms who fail to respond tend to do worse earlier on in the post implant period. This is in sharp contrast with the responder cohort whereby patients with QRSd < 120ms trend towards survival benefit in the early post implant period.

Conclusion: The responder rate in our cohort matches well with worldwide CRT responder rate of about 60%. Patients with QRSd > 150ms have the highest responder rate. Responders have a clear survival advantage over non-responders. For patients with QRSd < 120ms who fail to respond to CRT therapy, there is a trend towards mortality.

YIA 6

ASSESSMENT OF ATRIAL SEPTAL DEFECTS WITH REAL-TIME 3-DIMENSIONSAL TRANSOESOPHAGEAL ECHOCARDIOGRAPHY: A NEW INSIGHT INTO DYNAMIC CHANGES WITH CARDIAC CYCLE

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Background: Accurate assessment of atrial septal defects (ASD) anatomy and size are paramount in case selection, planning and procedural guidance for transcatheter device closure. ASD are well known to have complex geometry and may not be adequately visualized using conventional 2-dimensional (2D) transoesophageal echocardiography (TEE). Real-time 3-dimensional (RT3D) TEE allows complete evaluation of the entire interatrial septum anatomy as well as en face visualization of the defects.

Objectives: (i) to compare measurements of ASD size obtained by RT3D and 2D TEE, (ii) to study the dynamic changes of ASD during cardiac cycle and (iii) to assess feasibility of RT3D TEE to guide transcatheter ASD closure.

Methods: RT3D and multiplanar 2D TEE imaging were acquired in 25 patients with ASD (age 38.7 ± 13.6 years). En face views were used to assess the shape and type of defects. Following full volume acquisition, the ASD diameters in both major and minor axis were measured offline using Xcelera QLab software and compared with values obtained by 2D imaging. Defect areas by 3D planimetry were evaluated for changes during various cardiac cycles. For those with suitable lesions, transcatheter ASD closure were performed under RT3D TEE guidance.

Results: Out of 25 ASDs, 20 were oval, 3 were multiple and 2 were complex. RT3D TEE en face view enabled better appreciation of ASD shape and orientation in those with multiple and complex ASDs. There was high agreement between ASD diameters measured by RT3D and 2D TEE along major axis (19.7 ± 5.5 mm versus 18.7 ± 4.9 mm; mean difference = 0.9 ± 2.4 mm, r = 0.90) but correlation was weaker along minor axis (14.1 ± 5.1 mm versus 14.4 ± 3.7 mm, r = 0.75). There was significant change in ASD size during cardiac cycle; being smallest during atrial systole and largest during ventricular end-systole. The major axis, minor axis and total defect area varied as much as 5.2 ± 2.9 mm, 4.2 ± 3.6 mm and 1.13 ± 7.1 cm2 respectively (p < 0.001). There was also increase in the defect shape eccentricity during atrial systole (eccentricity index from 0.27 ± 0.19 to 0.32 ± 0.16). 22 patients successfully underwent transcatheter ASD closure with the mean device size of 25.1 ± 6.1 mm. Follow up transthoracic echocardiography revealed no patient with residual shunt.

Conclusion: RT3D TEE is highly accurate in assessing anatomy and size of ASD. It also provides new insight on the dynamic changes of ASD size and shape during cardiac cycle. These make this new modality an excellent choice to guide transcatheter ASD closure.