FREE PAPER SESSION 2

Canary I Room, 08:15h, 6th April 2019

08:15 – 08:25 **An Observational Cohort Study Using Secondary Data of Cardiovascular Risk Factors (CVRF) Control of Patients Treated Using the Acute Myocardial Infarction (Ami) Pathway in Changi General Hospital**

Daniel Fletcher*[1] ; Nashirah Kamal Mustapa*[1] ; Liew Boon Wah[2]
[1]Pharmacy/ Changi General Hospital/ Singapore, [2]Cardiology/ Changi General Hospital/ Singapore

08:25 – 08:35 **The Lipid Paradox in Patients with Non-ST Elevation and ST Elevation Myocardial Infarction and Percutaneous Coronary Intervention**

Ching-Hui Sia*[1] ; Andrew Fu-Wah Ho[2] ; Heerajnarain Bulluck[3] ; Hui-Li Zheng[4] ; Tiong-Cheng Yeo[1 5] ; Mark Yan-Yee Chan[1 5] ; Derek Hausenloy[6]
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08:35 – 08:45 **Influenza and Pneumococcal Vaccinations for Post PCI Patients**

Christina Khoo*[1]
[1]Cardiology Clinic / Ng Teng Fong General Hospital, National University Hospital System/ Singapore

08:45 – 08:55 **Impact of Chronic Kidney Disease on the Outcomes of Patients Undergoing Semi-Urgent and Elective Percutaneous Coronary Intervention**

Pei Ying Ho*[1] ; Ching Hui Sia[2] ; Rui Huai Lau[1] ; Tiong Cheng Yeo[1 2] ; Huay Cheem Tan[1 2] ; Mark Yan Yee Chan[1 2] ; Joshua Ping Yun Loh[1 2]
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08:55 - 09:05 **Rapid Eye Movement Related Obstructive Sleep Apnea in Diabetic Versus Non-Diabetic Patients Treated with Percutaneous Coronary Intervention: Rationale and Design of Sleep and Stent Study II**

Aye Thandar Aung*[1] ; Chieh-Yang Koo[2] ; Willian Kristanto[2] ; Pipin Kojdojojo[2] ; Calvin Chin[3] ; Chi-hang Lee[2]
[1]Medicine/ NUS/ Singapore, [2]Cardiology/ NUH/ Singapore, [3]Cardiology/ National Heart Centre/ Singapore

09:05 – 09:15 **Exploring the Use of Mandibular Advancement Device as an Obstructive Sleep Apnea Therapy in Asian Patients with Heart Failure**

Mahashne M*[1] ; Juliana Colpani[2] ; Aye Thandar Aung[3] ; Venesa Loh[3] ; Peiqing Xu[3]; Mei Teng Ong[2] ; Weiqiang Loke[2] ; Chi-Hang Lee[1]
[1]Cardiology/ National University Hospital/ Singapore, [2]Faculty of Dentistry/ National University Health System/ Singapore, [3]Medicine/ National University of Singapore/ Singapore

09:15 – 09:30 **Screening and Treatment of Obstructive Sleep Apnea in Acute Coronary Syndrome: A Randomized Clinical Trial**

William Kristanto,[3] Chieh-Yang Koo,[1] Ai-Ping Chua,[2] Esther Hui-Ting Koh,[4] Siang–Joo Tan,[1] Shaffinaz Abd Rahman,[2] Munirah Binte Abd Gani,[4] Jenny Pek-Ching Chong,[5,6] Aye-Thandar Aung,[1] Tun-Oo Han,[4] Siew-Pang Chan,[5,6] Adrian F. Low,[1,5] Tiong-Cheng Yeo,[1] Mark Y. Chan,[1,5,6] Pipin Kojodjojo,[1,3] Arthur Mark Richards,[1,5,6] Chi-Hang Lee,[5,6]
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Topic: Heart Failure / Cardiovascular Rehabilitation & Preventive Cardiology
Abstract No: 10299

An Observational Cohort Study Using Secondary Data of Cardiovascular Risk Factors (CVRF) Control of Patients Treated Using the Acute Myocardial Infarction (AMI) Pathway in Changi General Hospital

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Objective(s)
This study aims to compare the baseline CVRF values (at admission) and at first follow up (three months after discharge) of patients treated with the AMI pathway at CGH.

Material and Method
This is a quantitative study which used secondary data of patients' CVRF under the AMI pathway at CGH. The patients' information was accessed from the hospital's in-house registry stored under the REDCap systems. Data extracted were from 1st January 2016 till 31st March 2017. Sunrise Clinical Manager (SCM) was used to access the patients CVRF data. CVRF which were ordinal variables such as blood pressure, low-density lipoprotein, glycosylated hemoglobin, weight, and body mass index were tabulated and analyzed using the Statistical Package for Social Science (SPSS) v.21.0 t-test while smoking status which is a nominal variable was tested using McNemar's test.

Result(s)

A total of 691 suitable patients' data was used in this study. The t-test analysis showed a significant reduction in all CVRF except for body mass index ($p<0.001$). Body mass index showed a numerical reduction however it did not achieve statistical significance ($p=0.177$). There was also a reduction in smokers in the post-intervention period ($p<0.001$).

Conclusion

The AMI pathway is capable of significantly reducing CVRF in post-AMI patients. Further monitoring of CVRF beyond three months is needed to validate its potential.

Keywords: acute myocardial infarction; pathway; cardiovascular risk factors; Changi General Hospital

Topic: Invasive Diagnostic & Interventional Cardiology
Abstract No: 10404

The Lipid Paradox in Patients with Non-ST Elevation and ST Elevation Myocardial Infarction and Percutaneous Coronary Intervention

Ching-Hui Sia*[1] ; Andrew Fu-Wah Ho[2] ; Heerajnarain Bulluck[3] ; Hui-Li Zheng[4] ; Tiong-Cheng Yeo[1 5] ; Mark Yan-Yee Chan[1 5] ; Derek Hausenloy[6]

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Objective(s)
Elevated levels of low-density lipoprotein (LDL-C) and triglycerides (TG) are well-described risk factors for the development of acute myocardial infarction (MI). Despite these associations, studies have described the existence of a 'lipid paradox' in acute MI patients – Patients paradoxically have worse outcomes despite having lower LDL-C and TG levels. We conducted this study to clarify the relationship of the lipid paradox and clinical outcomes amongst non-ST elevation (NSTEMI) and ST elevation MI (STEMI) patients in patients who have had percutaneous coronary intervention (PCI).

Material and Method
Acute MI patients reported to the Singapore Myocardial Infarction Registry from 2007 to 2013 with PCI were studied. This information was linked to the national claims database to obtain the final discharge diagnosis for re-hospitalization outcomes. Exposure of interest was the lipid profile obtained within 72 hours of the acute MI (LDL-C, TG; Total cholesterol [TC]; high-density lipoprotein [HDL-C]). Primary outcomes were all-cause mortality during hospitalization, within 30-days and within 1-year. Secondary outcomes were re-hospitalization within 1-year for heart failure, stroke and MI.

Result(s)
There were 8988 NSTEMI and 12453 STEMI cases (n=21441). NSTEMI patients were older (60.3 years vs 57.6 years, $p<0.001$) and more likely to be female (22.6% vs 15.1%, $p<0.001$). In the NSTEMI subgroup, a lower LDL-C was paradoxically associated with better outcomes for death during hospitalization, death within 30 days from MI onset and death within 1 year from MI onset (all $p<0.001$) across the various LDL-C levels. Adjustment for demographic variables, co-morbidities and MI characteristics eliminated this paradox. However, in the STEMI subgroup, the lipid paradox for LDL-C persisted for all primary outcome endpoints after adjustment. An elevated TG level did not appear to be protective after adjustment.

Conclusion
An elevated LDL-C appears to be a protective prognostic marker in STEMI but not NSTEMI patients who have undergone PCI.

Keywords: pci, lipid paradox, cholesterol, myocardial infarction, ldl-c, triglycerides

Topic: Heart Failure / Cardiovascular Rehabilitation & Preventive Cardiology
Abstract No: 10384

Influenza and Pneumococcal Vaccinations for Post PCI Patients

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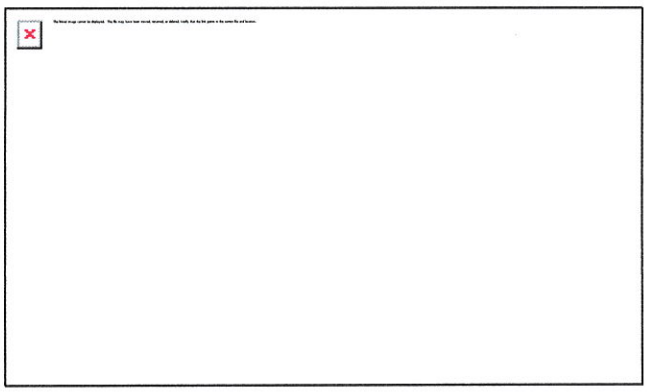
Objective(s)

1. To increase compliance with Influenza and Pneumococcal vaccinations
2. To reduce vaccine preventable disease among Post PCI patients

Material and Method

Prior to the screening intervention, only some patients were screened and offered vaccinations but it was not a standard practice. However, from 1st January to 28 February 2019 the team decided to standardise the practice of screening and offering vaccinations for all Post PCI patients during Cardiac Rehab Phase 1. Influenza and Pneumococcal vaccinations were offered to these patients; and were administered before patient discharge.



Result(s)

Pre intervention-out of a total of 68 patients, only 23 patients received vaccinations. Post intervention-out of a total of 67 patients, 36 patients received vaccinations during their inpatient stay.

Out of the 23 patients who received vaccinations from October to December 2018, only 1 patient went to ED the next day, reported feeling unwell and had high fever. There were no incidents of anaphylaxis, Bell's palsy; cellulitis and Guillain-Barre syndrome reported post Influenza and Pneumococcal vaccinations. During follow up with Cardiologist Post PCI at 4 to 6 weeks, there were no major illnesses related to vaccinations reported.

Conclusion

Vaccination has a potential impact on preventable disease. By integrating a screening process during Cardiac Rehab Phase 1, number of vaccinated patients increased from 34% to greater than 50%. Vaccinations are safe to be administered to Post PCI patients.

Keywords: Vaccinations, Post PCI patients

Topic: Invasive Diagnostic & Interventional Cardiology
Abstract No: 10304

Impact of Chronic Kidney Disease on the Outcomes of Patients Undergoing Semi-Urgent and Elective Percutaneous Coronary Intervention

Pei Ying Ho*[1] ; Ching Hui Sia[2] ; Rui Huai Lau[1] ; Tiong Cheng Yeo[1 2] ; Huay Cheem Tan[1 2] ; Mark Yan Yee Chan[1 2] ; Joshua Ping Yun Loh[1 2]
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Objective(s)

Chronic kidney disease (CKD) is a significant predictor of mortality in patients with acute coronary syndromes. Percutaneous coronary intervention (PCI) for CKD patients remains challenging due to higher complication rates. The effects of CKD on mortality in patients undergoing semi-urgent and elective PCI is unclear. This study aims to investigate the impact of CKD on the outcomes of subjects in this population.

Material and Method

This was a retrospective database study of patients who underwent semi-urgent and elective PCI from January 2014 to December 2015 at a tertiary academic centre. Patients were followed up until December 2018. The patients were stratified into 2 groups – Group 1 (eGFR< 60mls/min/1.73m^2) and Group 2 (eGFR≥60mls/min/1.73m^2). Demographics, risk factors and end-points (time-to-event analysis) including subsequent stroke/transient ischemic attack (TIA), myocardial infarction (MI), congestive cardiac failure (CCF) and all-cause mortality were analyzed.

Result(s)

Of the 1,602 patients studied, 321 were in Group 1 (20.0%). Group 1 patients were predominantly male (67.9%) and Chinese (59.2%), with a mean age of 68.5 ± 10.9 years and a higher co-morbid burden of hypertension, dyslipidemia, diabetes and peripheral vascular disease. In terms of outcomes, Group 1 patients were twice as likely to develop subsequent stroke/TIA (6.2% vs 3.1%, p=0.009), MI (12.1% vs 5.0%, p<0.001) and thrice as likely to develop subsequent CCF (13.1% vs 4.4%). In Group 1 compared to Group 2 patients, all-cause mortality (29.6% vs 5.1%, p<0.001) and cardiac-related deaths (15.0% vs 1.8%, p<0.001) were almost 6-fold and 8-fold greater respectively. On multivariate Cox Regression analysis, subjects with progressively lower eGFR were associated with an increased risk of all-cause mortality while those already on dialysis did not have higher all-cause mortality.

Conclusion

Patients with eGFR<60mls/min/1.73m^2 who underwent semi-urgent and elective PCI had a higher co-morbidity burden and greater all-cause mortality as eGFR worsens. Further studies are required to examine this association.

Keywords: PCI;outcome;CKD

Topic: Heart Failure / Cardiovascular Rehabilitation & Preventive Cardiology
Abstract No: 10293

Rapid Eye Movement Related Obstructive Sleep Apnea in Diabetic Versus Non-Diabetic Patients Treated with Percutaneous Coronary Intervention: Rationale and Design of Sleep and Stent Study II

Aye Thandar Aung*[1] ; Chieh-Yang Koo[2] ; Willian Kristanto[2] ; Pipin Kojdojojo[2] ; Calvin Chin[3] ; Chi-hang Lee[2]
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Objective(s)
The study aims to determine the prevalence of rapid eye movement (REM) obstructive sleep apnea (OSA) in patients with and without diabetes mellitus (DM) undergoing coronary revascularization.

Material and Method
The Sleep and Stent Study II is an observational, prospective study. A total of 200 adult patients age 21 to 80 years who underwent percutaneous coronary intervention between 6 and 36 months will be recruited. Recruited patients will undergo an in-laboratory polysomnography (PSG) using a level 1 diagnostic device (Embla RemLogic, Natus Medical Inc. Canada). The PSG tracings will be analyzed by registered polysomnographic technologist and reviewed by sleep physician, both of whom are blinded to patients' clinical characteristics. The primary measure of PSG is apnea hypopnea index (AHI). The patients will be divided into 2 groups; DM group (n=100) and non-DM group (n=100), and both groups will be adjusted for age, gender and body mass index.

Result(s)
A total of 110 patients (DM, n=38; non-DM, n=72) had been enrolled into the study as of January 31, 2019. We excluded patients with failed sleep studies (n=2) and central sleep apnea (n=3). According to the preliminary analysis of the first 105 patients (DM, n=34; non-DM, n=71), the prevalence of REM OSA was 24% in the DM group compared to 25% in the non-DM group. Moderate REM OSA (REM AHI: 5-15) was found in 50% of the DM and 61% of the non-DM group, whereas severe REM OSA (REM AHI: >15.1) was found in 38% of the DM and 39% of the non-DM group.

Conclusion
We expect the study to be completed and the results will be released in late 2019. The result of this study will help us in the understanding of cardiovascular impacts of REM OSA in diabetic patients with coronary artery disease.

Keywords: rapid eye movements related Obstructive Sleep Apnea; Diabetes; Percutaneous Coronary Intervention; coronary artery disease

Topic: Heart Failure / Cardiovascular Rehabilitation & Preventive Cardiology
Abstract No: 10296

Exploring the Use of Mandibular Advancement Device as an Obstructive Sleep Apnea Therapy in Asian Patients with Heart Failure

Mahashne M*[1] ; Juliana Colpani[2] ; Aye Thandar Aung[3] ; Venesa Loh[3] ; Peiqing Xu[3] ; Mei Teng Ong[2] ; Weiqiang Loke[2] ; Chi-Hang Lee[1]
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Objective(s)

Obstructive Sleep Apnea (OSA) is associated with Heart Failure (HF). CPAP is the first-line treatment, but it is limited by low adherence. Mandibular Advancement Device (MAD) is an approved alternative. It works by protruding the mandible forward during sleep. We assessed the impact of MAD on Apnea-Hypopnea Index (AHI) in 100 Asian patients with HF with reduced Ejection Fraction (HFrEF) and OSA.

Material and Method

This was a randomized, double-blind, placebo-controlled, cross-over trial. Eligible patients underwent polysomnography. Patients found to have OSA with AHI of ≥ 15 events/hr were randomized to (i) MAD followed by sham MAD (non-advanced device) or (ii) sham MAD followed by MAD. Each treatment mode lasted for 4 months (1-month acclimatization + 3-months of treatment) with a 2-week washout period in between. Polysomnography, Echocardiography, and biomarker evaluations were performed at the baseline, 5-month, and 9.5-month follow-up.

Result(s)

As of 22nd February 2019, 15 patients (14 male) were recruited with mean age 55 ± 8. Baseline polysomnography showed 5 patients (56%) had severe OSA (AHI ≥ 30), 2 patients (22%) had moderate OSA (AHI 15 - <30), 1 patient (11%) had mild OSA (AHI 5 - <15) and 1 patient (11%) did not have OSA (AHI < 5). 1 patient has completed the study. 1 patient has completed phase one and, is in the acclimatization period of phase two. 2 patients are in phase one.1 patient is in the acclimatization period of phase one. 2 patients have completed baseline polysomnography but have not started wearing the MAD. 2 patients' had AHI < 15 and did not continue after the baseline polysomnography. 6 patients have not done the baseline polysomnography. More data will be presented in the future.

Conclusion

If MAD is found to be effective, it could serve as a viable alternative therapy for OSA in Asian Patients with HF.

Keywords: Heart Failure; Obstructive Sleep Apnea; Obstructive Sleep Apnea therapy; Mandibular Advancement Device

Screening and Treatment of Obstructive Sleep Apnea in Acute Coronary Syndrome: A Randomized Clinical Trial

William Kristanto,[3] Chieh-Yang Koo,[1] Ai-Ping Chua,[2] Esther Hui-Ting Koh,[4] Siang–Joo Tan[1] Shaffinaz Abd Rahman,[2] Munirah Binte Abd Gani,[4] Jenny Pek-Ching Chong,[5,6] Aye-Thandar Aung,[1] Tun-Oo Han,[4] Siew-Pang Chan,[5,6] Adrian F. Low,[1,5] Tiong-Cheng Yeo,[1] Mark Y. Chan,[1,5,6] Pipin Kojodjojo,[1,3] Arthur Mark Richards,[1,5,6] Chi-Hang Lee[1,5,6]

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Objective(s)

Obstructive sleep apnea (OSA) is a negative prognostic factor in patients with acute coronary syndrome (ACS), a major cause of heart failure. This randomized controlled trial evaluated the effects of sleep-study guided multidisciplinary therapy (SGMT).

Material and Method

At two public hospitals in Singapore, patients admitted with ACS were enrolled and randomised into standard therapy (without sleep study) versus SGMT, comprising a sleep study during admission. Those with at least mild OSA were reviewed by a sleep physician and treated with continuous positive airway pressure and behavioural therapy. The primary end point was the change in N-terminal pro-brain natriuretic peptide (NT-proBNP) level from baseline to 7-month follow-up; the secondary end points were the changes in suppression of tumorigenicity 2 (ST2) and high-sensitivity C-reactive protein (hs-CRP) levels.

Result(s)

Among the 159 patients completed the trial, 70 were randomized to the SGMT group. 21 (30%), 15 (22%) and 27 (39%) were diagnosed with mild, moderate and severe OSA, respectively. CPAP and a positional pillow were prescribed to 57 (91%) and 6 (9%) patients with OSA. Average CPAP adherence was 3.8 ± 2.6 hours per night.

Although the plasma NT-proBNP levels were lower after 7 months compared to the baseline, the levels did not differ significantly between the SGMT and standard therapy groups at baseline (579 ± 1117 vs. 611 ± 899 pg/dL, p = 0.851) or 7 months (90 ± 167 vs. 93 ± 174 pg/dL, p = 0.996). The changes in NT-proBNP levels from baseline to 7 months were similar between the SGMT and standard therapy groups (–489 vs. –518 pg/dL, p = 0.726). Similar findings were observed for the ST2 and hs-CRP levels.

Conclusion

OSA screening and multifaceted treatment during the sub-acute phase of ACS did not further reduce the levels of cardiovascular biomarkers when compared with standard therapy.