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Abstract: Research Articles

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Effects of Smoking in Coronary Artery Bypass Grafting (CABG) patients with Functional Capacity in General Hospital Haji Adam Malik Medan

Ladita N[1], Raditra GA[1], Tarigan S[1], Maulidia R[1], Reynaldo AH[1]
[1]Department of Cardiology and Vascular Medicine, Faculty of Medicine, University of North Sumatera / Haji Adam Malik General Hospital, Medan, Indonesia

Background and aims : Smokers have increased airflow resistance and reduced exercise tolerance. Postoperative CABG patients will generally experience improvement in symptoms and functional capacity. The aim of the study is to determine the cardiovascular risk factors that predict changes in functional capacity in patients who have completed a Cardiac Rehabilitation Program (CRP).
Methods : We performed a cross-sectional descriptive retrospective study of 68 patients who began a CRP after coronary artery bypass graft (CABG) in 2017-2020 from Adam Malik Hospital registry. The outcomes assessed were work status in 6 month after CABG. Patients' characteristics, sociodemographic and clinical parameters of functional capacity using 6 minutes of walk test (6MWT) were assessed.
Results : We identified 68 patients undergoing isolated CABG (2017–2020). One year after discharge for CABG, 40 (58.8%) patients had returned to the workforce. Factors associated with functional capacity were identified using bivariate logistic regression. We found association between low functional capacity with smoker patients (p = 0.006).
Conclusion : This study highlights that functional capacity were significantly reduced in smoker patients after CABG.

Keywords : CABG, Functional Capacity, Smoker

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Correlation between Left Ventricular Ejection Fraction and Six-Minute Walk Test in Acute Coronary Syndrome Patients who Underwent Percutaneous Coronary Intervention

D.Budiono[1], L.Wongso[1], V.F.F.Joseph[1], N.S.Lampus[1], J.A.Pangemanan[1], A.L.Panda[1]
[1]Department of Cardiology and Vascular Medicine, Faculty of Medicine, Sam Ratulangi University, Prof. Dr. R.D.Kandou General Hospital, Manado, Indonesia

Background and aims : Acute coronary syndrome (ACS) is the leading cause of mortality worldwide. Reduced left ventricular ejection fraction (LVEF) is associated with increased mortality after ACS events. Six-minute walk test (6-MWT) is simple test to assess functional exercise capacity and prognosis. This test can be performed early after ACS. We conducted this study to determine the correlation between LVEF with 6MWT distance and metabolic equivalents (METs) in ACS patients who underwent PCI.
Methods : This is a cross-sectional study with total 238 ACS patients treated with PCI from July 2019 to April 2022. Before discharge. patients were made to walk at their own convenient pace as much as possible in six minutes. Echocardiograhy were performed on all the patients. Correlation between LVEF and 6-MWT distance and METs were analyzed using Spearman Correlation Test.
Results : The mean age of patients were 57.02 ± 9.86 years old. Most of them were male (86%). We found a weak positive correlation between LVEF and 6 MWT distance ($r = 0.269$, $p = 0.0005$), also with METs
($r = 0.233$, $p = 0.00046$)
Conclusion : Left ventricular ejection fraction (LVEF) have weak correlation with 6-MWT distance and METs in ACS patients who underwent PCI

Keyword : Left Ventricular Ejection Fraction, Six-Minute Walk Test, ACS, PCI

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Effect Of Video Education About Hypertension On Knowledge Of Housewives In Rural Area

I.M Sufiyah[1*], T.N Susanto[1], D.R Firmanda[1], E.A Fitriyah[1], P. Qualisa[1], M. Ardiana[2]
[1]Faculty of Medicine Airlangga University, Surabaya
[2]Dr. Soetomo General Hospital, Department of Cardiology and Vascular Medicine, Surabaya, Indonesia

Background and aims : Hypertension is still a global health problem up to this day. An initial survey conducted on housewives in the rural area showed a lack of knowledge about Hypertension. This study aimed to analyze the effect of providing educational videos on changes in the knowledge of housewives in the rural area of Malang, East Java about hypertension.
Method : The design of this study was a non-randomized control group with pre-test and post-test evaluation. The subjects were housewives that were grouped into experimental and control groups with the sum of 30 subjects each. The experimental group was educated with videos related to hypertension.
Result : The pre-test and post-test scores were respectively (24.67 ± 10.1/29.53 ± 10.5) in the control group while in the experimental group (34.52 ± 11.2/60.0 ± 10.2). Although the difference in the pre and post-test scores in both groups showed a significant difference ($p<0.005$), the greater difference was seen in the experimental group ($\delta = 25.48$). The comparative study showed that there was a significant difference between the two groups ($p<0.001$).
Conclusion: There was an effect of providing educational videos about hypertension on the knowledge of housewives. Health education needs to be held periodically and continuously. The selection of simple but interactive educational methods is also required for the effectiveness of education.

Keywords: Health education, Video, Hypertension, Housewives.

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Effect of Body Mass Index on Exercise Capacity : A Cross-Sectional Study in Chronic Heart Failure Patients

Erlinda Pretty Laksneri[1], Ahmad Watsiq Maula[2], Anggoro Budi Hartopo[1], Hariadi Hariawan[1]
[1]Department of Cardiology and Vascular Medicine, Faculty of Medicine, Public Health and Nursing, Universitas Gadjah Mada, Dr. Sardjito Hospital, Yogyakarta, Indonesia
[2]Department of Biostatistics, Epidemiology, and Population Health, Faculty of Medicine, Public Health and Nursing, Universitas Gadjah Mada, Yogyakarta, Indonesia

Background and aim : Neurohormonal activation, immune activation, and imbalance of anabolic catabolic processes contribute to exercise intolerance, weight loss, and progression of heart failure (HF). On the other hand, an increase in body mass index (BMI) without edema indicates a good metabolic reserve, increased tolerance to metabolic stress, and a good prognosis for HF. This study aimed to analyze the association between BMI and exercise intolerance in chronic heart failure (CHF).
Methods : This cross-sectional observational study included data from 64 patients aged 18 years and above diagnosed with CHF with reduced, mildly reduced, and preserved ejection fraction (EF) who were admitted to the Cardiology Clinic of Dr. General Hospital Sardjito, Yogyakarta, Indonesia. The 6MWT distance was used as an indicator of exercise intolerance.
Results : Males predominated in this study compared to females (90.6% vs. 9.4%). The etiology of heart failure was 78.1% of ischemic heart disease (IHD) and 21.9% of IHD combined with hypertensive heart disease (HHD) with a mean EF of 37%. There was an association between BMI and exercise intolerance with OR=0.27 (95% CI = 0.08-0.80,p=0.037), and after adjusting for other variables (age,sex,diabetes mellitus,hypertension,smoker,stroke non hemorrhagic,statin,nitrate, diuretic,angiotensin-converting enzyme,beta-blocker,EF, coronary artery disease, and cardio ankle vascular index), the association persisted (OR=0.03, 95% CI=0.00-0.30,p=0.011). The OR indicated that people with a high BMI (>25) were less likely to have exercise intolerance.
Conclusion : A high BMI in CHF patients was associated with better exercise tolerance.

Keywords: body mass index, chronic heart failure,six-minute walk test, exercise intolerance

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The Role of Cardiometabolic and Cardiac Remodeling and Their Connection to Hypertensive Response to Exercise in the Development of Hypertension and Hospitalization of Major Adverse Cardiac Event Patients

I Wayan Agus Surya Pradnyana [1], Gusti Ngurah Prana Jagannatha[1], Stanly Kamardi [1], AA Ayu Dwi Adelia Yasmin[2]
[1] Bachelor of Medicine, Faculty of Medicine, Udayana University, Denpasar, Bali, Indonesia;
[2] Department of Cardiology and Vascular Medicine, Faculty of Medicine, Udayana University, Denpasar, Bali, Indonesia.

Background and aims: Hypertensive response to exercise (HRE) is a risk for future development of hypertension. HRE is associated with functional and structural abnormalities, especially when accompanied by increased blood pressure. To determine the structural and metabolic factors associated with HRE in non-hypertensive patients and the role of HRE in predicting the development of hypertension and predicting hospitalization due to major adverse cardiac events (MACE).

Method: This cross-sectional retrospective study uses cardiac treadmill stress test (CTST) data at Sanglah General Hospital, Bali, 2016–2020. Pearson chi-square test and Mann-Whitney test were used to compare categorical variables and mean echocardiographic based on the presence of HRE. Development of hypertension and history of hospitalization after cardiac TST due to MACE until April 2022.

Result: 202 non-hypertensive patients (47,1% with HRE) who underwent cardiac TST. During follow-up, 19.8% experienced hospitalization, and 26.1% developed hypertension. Obesity (PR 1.727;95%CI 1.235–2.413), smoking status (PR 1.773;95%CI 1.170–2.687), T2DM (PR 2.29;95%CI 1.16–3.37), high LDL level (PR 1.853,95%CI1.229-2.794) and history of kidney disease (PR 1.985;95%CI 1.478–2.665), were significantly associated with HRE (p-value<0.05). HRE Patients had an increased risk of developing hypertension (PR 1.72;95%CI1.235–2.413 p=0.05) and hospitalization due to MACE (OR 2.27,95%CI1.62–3.16, p=0.0001) with a sensitivity of 76.7% and specificity of 93.6%, higher LV mass index, higher E/E' ratio, higher LAVI with p-value <0.05.

Conclusion: Cardiac TST examination may detect patients with an impaired cardiometabolic and cardiac remodeling in a patient with HRE, which may predict the future development of hypertension and MACE.

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Blood Pressure Diary as a Community-Based Intervention to Improve the Perception of Treatment in Hypertensive Patients

Achmad Bima Aryaputra[1], Agatha Vanisya Putri[2], Maulidya Magfirah[3], Nur Sulmi[4], Nunung Nuryani Sumartono[5]
[1]RSU Islam Klaten, [2]RSU Astrini Wonogiri , [3]Puskesmas Payabakong, [4]RS Pendidikan Universitas Syah Kuala, [5]Puskemas Jenangan, Indonesia

Background and aims: One of the most important modifiable risk factors for cardiovascular disease is hypertension, a global health concern. Comprehensive hypertension treatment is a crucial factor in the prevention of cardiovascular disease. The purpose of this study was to alter patient's attitudes of hypertension treatment by emphasizing patient involvement in their care.
Method: This cross-sectional study was performed on 21 adults with hypertension residing in Panjeng village, Ponorogo in November 2020 as population sample. Blood sample was collected for measuring blood sugar, total cholesterol, and uric-acid level. The study's intervention was the provision of a blood pressure diary, which includes pages for recording blood pressure readings as well as informational pages on hypertension. The Healthy Family Index was utilized to evaluate the impact of the intervention.
Result: The average age of the sample was 63,3 ± 10,5 years, and 76,2% were female. Among those subjects, 61,9% of participants had grade 2 hypertension and 23,8% were committed to taking their medicine regularly. According to the findings of the Healthy Family Index, the indicator of treatment adherence was increased by 6% a year after the intervention (36.4% (2020) vs. 42% (2021). We also discovered several cardiovascular risk factor among the subjects, including diabetes (14,3%), hyperuricemia (33%) and dyslipidemia (47,6%).
Conclusion: A promising community-based intervention to enhance patient treatment perception as well as track and assess hypertension treatment is the blood pressure diary. To ascertain the direct impact of this intervention on medication adherence, further extensive research is required.

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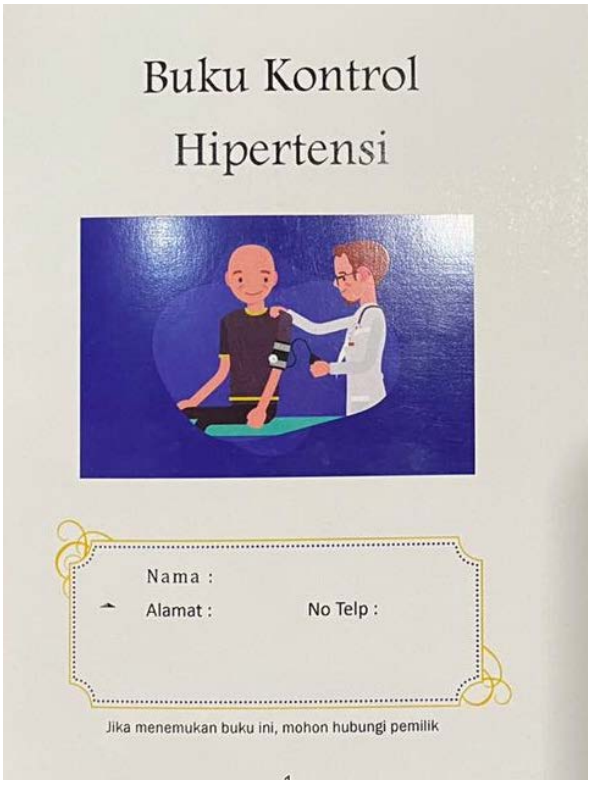

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Prediction Of Coronary Heart Disease Using Framingham Scores In Treated Patients In Sebamban Ii Health Center, Tanah Bumbu, Kal-Sel

Maulana Saputra,[1] Dyni Iswatinnisa[2], Ahmad Ulwan[3] Gilang Mauladi [4]
[1,2,3] General Practitioners, Sebamban II Health Center, Tanah Bumbu, South Kalimantan
[4]SMF for Heart and Blood Vessel Diseases, Boejasin Hospital, Tanah Laut, South Kalimantan

Background and aims: FRS (Framingham score) is an algorithm for assessing the risk of coronary heart disease (CHD) recommended by the American Heart Association as a guide for early detection of CHD risk to reduce morbidity and mortality due to CHD, this study aims to determine how to predict coronary heart disease uses FRS in patients seeking treatment at the Sebamban II Public Health Center, Tanah Bumbu, South Kalimantan. Knowing the risk factors for coronary heart disease in the next 10 years in outpatients at the Sebamban II health center in April-May 2022.
Methods: Observational, analytic research with a cross-sectional method. Sampling used a consecutive sampling technique on 100 respondents at the Sebemban II Health Center, Tanah Bumbu, South Kalimantan in April-May 2022. The research data were primary in the form of personal data along with a history of the disease, smoking, and the results of measuring blood pressure, total cholesterol levels, and HDL levels.
Result: High, medium, and low risk were found respectively 34%, 13%, and 53%. For comparison, the ratio of men and women who are at high risk is 61.77% and 38.23%, respectively. Subjects with high serum total cholesterol and low serum HDL cholesterol were 45% and 45%, respectively.
Conclusion: Most patients seeking treatment at the Sebamban II Health Center, Tanah Bumbu, South Kalimantan have a low risk of coronary heart disease within the next 10 years. It can be concluded that the use of FRS can be used to predict the risk of CHD in primary care.

Keywords: Coronary heart disease, Framingham Risk Score

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Correlation of Six Minute Walk Distance of in-hospital post-PCI Subjects based on Age, Gender and Body Mass Index at Saiful Anwar Hospital, Malang

Danti U Setyowati[1,2], Nikhen N[1,2], M Bayu A[1,2], Fikri[1,2], Cholid Tri T[1,2], Veny M[1,2]
[1]Faculty of Medicine, University of Brawijaya, Malang, East Java, Indonesia; [2]Department of Cardiology and Vascular Medicine, Dr. Saiful Anwar General Hospital, Malang, East Java, Indonesia

Background and aim : Coronary Artery Disease (CAD) is a serious healt problem with increasing incidence in developed countries. For those who underwent PCI procedure especially, it became a challenge to motivate the patient to start their cardiac rehabilitation program. The self-paced six-minute walk test (SMWT) is a simple assessment for sub-maximal functional capacity. It Is a commonly used test to estimate functional exercise capacity, prognosis in daily activities and rehabilitation prescription. This study aimed to determine the correlation between distance in SMWT of in-hospital post-PCI subjects and to explore its determining factors.
Method : This was a descriptive observational study, we conducted six-minutes walking distance (SMWD) on 243 patients diagnosed with CAD underwent PCI procedure. Age, gender, BMI were measured. Pretest and post-test vital parameters were recorded. The SMWD was identified in all subjects.
Result : The mean SMWD was 326±98 meters. There were 76 patients with <300 m SMWD; 52,7% of them were female and 167 patients with >300 m SMWD; 75% of them were male. The Chi-Square test showed that there was significant correlation between gender and SMWD (r=0.243, P=0.000). Using Spearman Correlation, SMWD showed significant correlations with gender (r=-0.254, P=0,003) but BMI (r=0.063, P= 0,338) and age (r=-0.077, P=0,231) were not significantly correlated.
Conclusion : There was significant correlation between gender and SMWD, age and BMI were not significantly correlate. But lackness data of comorbidities, risk factors, and number of vessels need to be considered for a better result of the advanced study with longer follow-up time span.

Keywords: Six-minute walk test, Six-minute walk distance, coronary artery disease

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Smoking Behaviour in Coronary Heart Disease Patients at Hasan Sadikin General Hospital

Agastya Prabhaswara[1], Badai Bhatara Tiksnadi[1], Rizkania Ikhsani[1], Transiska Liesmadona Bijaksana[1], Nicolaus Novian Dwiya Wahjoepramono[1], Najmi Fauzan Tarsidin[1]
[1]Department of Cardiology and Vascular Medicine, Faculty of Medicine, UnivesitasPadjadjaran, Hasan Sadikin General Hospital, Bandung, Indonesia

Background and aim : Smoking was known as a risk factor for coronary heart disease (CHD), yet there are still lack of studies regarding smoking behaviour in Indonesia which may be beneficial for patient education strategies. This study is aimed to describe the characteristics of smoking behaviour, including amount ofcigarette smoked, age started smoking, duration of smoking and cessation, in CHD patients atHasan Sadikin General Hospital.
Methods : This cross-sectional study was carried out between September-December 2019. CHD patientsaged ≥18 years were recruited. Smoking status were divided to smokers (current smokers/quit smoking <6 months), ex-smokers (quit smoking ≥6 months), and never smoked.Smoking behaviour was obtained through direct interviews.
Results : We recruited 100 subjects diagnosed with CHD, consisting of 79 males (mean age: 58.9±10.4).Forty (40%) subjects who were smokers were all male whereas from 31 (31%) subjects who were ex-smokers, only one (1%) subject was female. These results were higher compared to previous study. The average amount cigarette smoked was 12.5±5.9 cigarettes per day. The average age subjects started smoking was 20.6±3.7 years old and the average duration of smoking was 34.02±9.02 years. From 31 subjects who were ex-smokers, the average durationof smoking cessation was 9.08±8.87 years. Forty-four (62%) of 71 subjects with smoking as risk factor, were moderate smokers according to Brinkman Index with the average value of 431.2±251.5.
Conclusion : The proportion of CHD patients who had smoking as risk factor was high, were predominantlymale, started smoking at relatively young age, and were moderate smokers.

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Association between Habitual Physical Activity and Cardiovascular Risk Factors in Coronary Artery Disease Patients at Hasan Sadikin General Hospital

Rizkania Ikhsani[1], Badai Bhatara Tiksnadi[1], Agastya Prabhaswara Putra[1], Transiska Liesmadona Bijaksana[1], Nicolaus Novian Wahjoepramono[1], Najmi Fauzan Tarsidin[1]
[1]Department of Cardiology and Vascular Medicine, Faculty of Medicine, Univesitas Padjadjaran, Hasan Sadikin General Hospital, Bandung, Indonesia

Background and aims : Physical inactivity has been identified as one of the cardiovascular (CV) risk factors, as well asaffecting other CV risk factors. However, their clinical association was undiscovered, and there are no data in Indonesia regarding habitual physical activity in CAD patients. This study aimed to discover the association between habitual physical activity and CV risk factors and describe the physical activity, sport index, work index, and leisure index among CAD patients.
Methods : This cross-sectional study was conducted from September to December 2019 at HasanSadikin General Hospital. Established CAD patients aged ≥18 years were recruited. CV risk factors were obtained through interview. Physical activity was categorized as low, moderate,and high. Sport, work, and leisure index were determined using Baecke questionnaire which scored 1-5 for each index. Statistical analysis using Chi-square and t-test.
Results : 89 CAD patients (78.7% males; mean age 58.97±9.9 years) were included; 60.7% had hypertension, 11.2% had dyslipidemia, and 32.6% had diabetes mellitus (DM). Patients with low, moderate, high physical activity were 61.8%, 31.5%, and 6.7%, respectively. 13 patients (14.2%) exercise regularly, the types of exercise mostly done is badminton as many as 4 patients (30.8%), others vary such cycling, jogging, walking, tennis, football, and aerobics. Themean sport, work, leisure index were 2.24±2.5, 2.76±0.62 and 2.66±0.49. The physical activityassociated with hypertension (p=0.036) whilst no significant association with dyslipidemia (p=0.321) as well as DM (p=0.533). Sport, work, and leisure index not associated withhypertension, dyslipidemia, or DM (p>0.05).
Conclusion : This study showed most CAD patients were physically inactive. Habitual physical activity which consists of sport, work, and leisure index not associated with CV risk factors. From all habitual physical activity parameters, only physical activity that was associate with hypertension**.**

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Association Of Hypertension With Multiple Pre-Existing Comorbidities and Its Impact On COVID-19 In Balinese Population: The Importance Of Cardiovascular Disease Prevention On Optimizing COVID-19 Outcome

Subtitle: Impact of Hypertension on COVID-19 and The Importance of Cardiovascular Prevention

Putu Satyakumara Upadhana[1], I Gede Gita Sastrawan[1], I Gusti Agung Ayu Chintya Cahyarini[1], Ida Bagus Rangga Wibhuti[2], I Ketut Agus Somia[3]
[1]Bachelor of Medicine and Medical Profession, Faculty of Medicine, Udayana University, Denpasar, Bali, Indonesia; [2]Department of Cardiovascular Medicine, Sanglah General Hospital Denpasar, Faculty of Medicine, Udayana University, Denpasar, Bali, Indonesia; [3]Department of Internal Medicine, Sanglah General Hospital Denpasar, Faculty of Medicine, Udayana University, Denpasar, Bali, Indonesia

Background and aims : People with hypertension and multiple pre-existing comorbidities are at a higher risk of mortality from COVID-19. This study aims to identify the association of hypertension with pre-existing comorbidities and its impact on COVID-19 in Balinese population.
Methods: This research is an observational analytic study with a cross-sectional approach. The data used is secondary data from the records of confirmed COVID-19 patients who were treated at Sanglah Hospital on 1 August 2020 to 31 February 2022 with total sampling technique.
Results: There were 1056 patients involved in this study. Most of the patients were male (n=571; 54.1%), with a median age of 59 years old. Most of the patients were categorized as severe COVID-19 (n=641; 60.7%). A total of 285 patients had hypertension (27.0%). Mann Whitney analysis showed significant differences in age (p=0.000) blood glucose (p=0.001), BUN (p=0.001), SC (p=0.000), GFR (p=0.000), and hospitalization duration (p=0.000) in the patients classified based on hypertension. Chi-square analysis showed a significant association of pleural effusion (PR=1.413;p=0.008), malignant arrhythmia (PR=1.654;p=0.017), stroke (PR=1.867;p=0.000), type 2 diabetes mellitus (T2DM) (PR=1.707;p=0.000), and kidney disease (PR=1.663;p=0.000) with hypertension. Logistic regression analysis showed a significant association of pleural effusion (PR=1.575;p=0.031), hospitalization duration (PR=1.562;p=0.005), T2DM (PR=1.630;p=0.003), and kidney disease (PR=1.602;p=0.003) with hypertension. Hypertension was significantly associated with severe COVID 19 (PR=1.337;p=0.007), mortality (PR=1.289;p=0.040) and longer hospitalization duration (PR=1.531;p=0.000). Association of hypertension with T2DM was significantly associated with severe COVID-19 (PR=1.918;p=0.002), and mortality (PR=1.470;p=0.036).
Conclusions: There is a significant association between hypertension and worse outcome in COVID-19 patients with underlying comorbidities.

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Correlation Between Triglyceride Glucose (Tyg) Index and Mace During Hospitalization in Patients with NSTEMI at Adam Malik General Hospital

M. Ramzie, R. Hasan, N.Z. Akbar
Department of Cardiology and Vascular Medicine
School of Medicine, Universitas Sumatera Utara, Medan, Sumatera Utara

Background and aims : NSTEMI is one of clinical syndrome encompassed by ACS identified with lack of ST segment elevation during ECG examination. It has been proven that dislipidemia and diabetes are significant and modifiable risk factors regarding ACS. Due to such prior knowledge, TyG index as one of metabolic and endocrine marker obtained by combining diabetes and dyslipidemia laboratory parameter may help predict the outcome of NSTEMI patient during their hospitalization. The aim of this study was to observed correlation between TyG index and MACE during NSTEMI patient hospitalization in Adam Malik General Hospital.
Method : This is an ambispective cohort study. NSTEMI patient will be identified and screened and then collected patient data from medical record and examined TyG index by ln [fasting triglycerides (mg/dl) x fasting glucose (mg/dl) /2] . TyG index classificated into ≤8.805 and ≥8.805 then were observed for MACE during hospitalization.
Result : This study included 86 NSTEMI patient. After follow up period, MACE event was found in 54 patient. TyG index mean was 9,153 ± 0,76 with MACE patient index was 9,26 ± 0,79. After Mann Whitney U analysis, we found a correlation between TyG index and MACE event with p = 0,024. ROC curve analysis showed that TyG index was able to predict the incidence of MACE (cut-off point 9.0021, AUC = 0.646, p<0.024, sensitivity 61.1%, specificity 65.6%)
Conclusion : There is correlation between TyG index and MACE such that TyG index could predict MACE event in NSTEMI patient's hospitalization.

Keyword: Diabetes, Dyslipidemia, NSTEMI, MACE

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Effects of Cardiac Rehabilitation Program on Right Ventricular Function after Congenital Heart Disease Surgery

A.D. Prasetyo[1], I.A. Arso[1], A.B. Hartopo[1], V.Y. Anggraeni[1], L.K. Dinarti[1], D.W. Anggrahini[1]
[1]Department of Cardiology and Vascular Medicine, Faculty of Medicine, Public Health and Nursing, Universitas Gadjah Mada - Dr. Sardjito General Hospital, Yogyakarta

Background and aims: Cardiac rehabilitation has been recognized as the effective strategies for improving peak-VO2 and cardio respiratory fitness after Congenital Heart Disease (CHD) Surgery. However, the effect of this program on right ventricular (RV) function following CHD Surgery is unclear. To investigate the impact of cardiac rehabilitation program on the RV function in adult patients who underwent CHD Surgery.
Methods: We performed a retrospective analysis in patients who underwent CHD Surgery since January 2021 to December 2021 at Dr. Sardjito General Hospital. Tricuspid annular plane systolic execution (TAPSE) and Left Ventricle Ejection Fraction (LVEF) from two-dimensional echocardiography was performed at the end of surgery and at the end of the program to evaluate RV and LV function. Univariate and bivariate analysis were carried out.
Results: Thirty-one patients were included to this study. Twenty-six patients [age (y): 37.7±12.5; female: 20 (80.8%)] participated in the program as rehabilitation group (RG) and five patients [age: 30.8±10.5; female: 5 (100%)] refused to attend the program as control group (CG). At the end of the program compared with postoperative evaluation, there were no differences in LV function (LVEF 61.9% to 66.4%), but significant increase of RV function parameters were observed in both RG and CG (TAPSE RG: 12.8 mm to 18.1 mm; CG: 12.6 mm to 19.4 mm). The parameters of the RV function improved in both groups, but this improvement was not associated with participation in the program (p= 0.3).
Conclusion: The RV function parameters gradually improved after CHD surgery. However, this progress was independent of cardiac rehabilitation program.

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Effect of Circadian Onset Pattern as Predictor of Acute Coronary Syndrome Outcome: a Retrospective Cohort Study from East Java, Indonesia

Imanita Septianda[1], Dita Aulia Rachmi[1], Bagus Putra Dharma Khrisna[1], Ryan Enast Intan[1]
[1]Department of Cardiology and Vascular Medicine Dr. Soetomo General Hospital – Universitas Airlangga, Surabaya, Indonesia

Background and aims : Previous study has showed that circadian rhythm was corelated with cardiovascular disease. To evaluate circadian symptom onset pattern on acute coronary syndrome (ACS) outcome.
Method : This was a retrospective cohort study of all ACS patient in suburb regional general hospital that met the inclusion criteria. Onset pattern measured were circadian onset pattern (00:00-05:59, 06:00-11:59, 12:00-17:59, and 18:00-23:59). Evaluated outcome were GRACE mortality risk score on admission, recurrent ACS and heart failure (HF) incidence in one month.
Result : Ninety-two patients have met the inclusion criteria. The mean age was 55.9 years, 66% patients were men, 51.1% presented with STEMI, with median pre-hospital delay was 6.75 hour. ACS incidence was not significantly different regardless circadian variation ($p>0.05$).
In circadian pattern onset analysis, there was significant difference of GRACE mortality risk score and heart failure incidence between onset hour, but no significant difference was found in recurrent ACS ($p=0.021$; 0.038; 0.430 respectively). Further multivariate analysis using regression logistic model, showed onset of ACS symptom between 18:00–05:59 hour was not directly associated with increased risk of HF compared to 00:00–17:59 hour($p=0.403$), but secondarily by affecting other covariates, where during that time, CKMB and %LV EF were significantly higher and lower ($P=0.008$ and 0.025) respectively and indepedently associated with HF incidence ($P=0.036$ and 0.015).
Conclusion : Circadian variation was secondarily associated with HF incidence by affecting pattern of CKMB level and LV EF. Night hour onset (18.00-05.59) was also a predictor of higher level of GRACE mortality risk score.

Keyword: Circadian, ACS, HF, GRACE score

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Comparison Of Functional Capacity In Patients Postcoronary Artery Bypass Grafting And Mitral Valve Replacement Surgery After Cardiac Rehabilitation

M.P. Adiningsih[1], V. Y. Anggraeni[2], A.B. Hartopo[2], I.A. Arso[2]

[1]Resident of Cardiology and Vascular Medicine, Faculty of Medicine, Public Health and Nursing, Universitas Gadjah Mada – Dr Sardjito General Hospital, Yogyakarta, Indonesia

[2]Staff of Cardiology and Vascular Medicine, Faculty of Medicine, Public Health and Nursing, Universitas Gadjah Mada – Dr Sardjito General Hospital, Yogyakarta, Indonesia

Background and aims : Coronary artery bypass grafting (CABG) is a surgical procedure for myocardial revascularization. Mitral valve replacement (MVR) surgery is a common procedure in treating patient with mitral valvular disease. Both procedures is usually followed with cardiac rehabilitation to improve functional capacity after surgery but it is not known whether there is a difference in functional capacity between both group. The goal of this study was to compare the functional capacity between patients after CABG and MVR surgery who completed cardiac rehabilitation.
Methods : We enrolled patients who underwent CABG or MVR surgery age 45 year old and above, who completed cardiac rehabilitation until evaluation with treadmill test (TMT) since January 2021 to June 2022 at Dr Sardjito General Hospital. The functional capacity was measured using TMT and converted to metabolic equivalent of task (METs).
Results : A total of 12 subjects in CABG group and 12 subjects in MVR group were included in this study. The mean age of CABG group was 57.3±4.42 and MVR group was 51.9±4.64. All patients enrolled in CABG group were male (100%, n=12). In MVR group 58.3% were females (n=7), and 41.7% were males (n=5). Mean ejection fraction (EF) after procedure in CABG and MVR group were 52.75±9.15% and 54.0±9.71%, respectively. We analyzed the functional capacity in both group with Mann Whitney test. There was a significant difference of functional capacity between CABG group and MVR group after cardiac rehabilitation (p=0.008). Mean METs in CABG group was 8.46±2.18 METs, whereas in MVR group was 6.54±2.14 METs.
Conclusion : Functional capacity after cardiac rehabilitation in patients post CABG were better and significantly different than patients who underwent MVR surgery.

Keyword: functional capacity, CABG, MVR, cardiac rehabilitation

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The Impact of Classical Cardiovascular Risk Factors on Hospitalization and Mortality among Hajj Pilgrims

Dita Aulia Rachmi[1], Bagus Putra Dharma Khrisna[1], Imanita Septianda[1], Eka Rahayu Utami[1], Makhyan Jibril Al Farabi[1], Yusuf Azmi[1]
[1]Department of Cardiology and Vascular Medicine Dr. Soetomo General Hospital – Universitas Airlangga, Surabaya, Indonesia

Background : Cardiovascular disease (CVD) is the leading cause of morbidity and mortality during Hajj. This study aims to identify the impact of classical factors of the cardiovascular event and impact on hospitalization requirement among pilgrims from East Java during 2017, 2018, and 2019 Hajj.
Methods : This study was a retrospective cohort of Hajj pilgrims from East Java, Indonesia, from 2017 to 2019. The data of risk factors were obtained from the pre-embarkation Hajj screening records. The diagnosis of hospitalization and cause of death during the Hajj period were obtained from the medical report and hospital/flight doctor death certificate.
Results : A total of 72078 eligible subjects were included in this study. 33807 (46.9%) were men, and 38271 (53.1%) were women, and the majority (35%) were aged between 50 and 59 years old. A total of 42446 pilgrims (58.9%) were classified as high risk due to underlying health conditions such as hypertension, diabetes, or if they were aged 60 years or older. The overall hospitalization rate is 971 per 100,000 pilgrims. Men gender, pilgrims aged 60 years or older, hypertension, diabetes, and obesity were associated with increased hospitalization. The overall death rate is 240 deaths per 100,000 pilgrims. The mortality rate was higher in men, pilgrims aged 60 years or older, and pilgrims with a history of hypertension or diabetes. Of all hospitalized patients, 92 patients (13.1%) had an initial diagnosis of CVD, and CVD is the main cause of mortality (38.2%) of pilgrims.
Conclusion : Pilgrims with classical cardiovascular risk factors were associated with increased hospitalization and mortality. Moreover, CVD was accounted for about 13% of hospitalization and the majority of the causes of death.

Keywords: Hajj, pilgrims, classical cardiovascular risk factor, hospitalization, mortality

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Comparison of cardiovascular disease risk levels prediction based on WHO 2019 Charts for Southeast Asia and Jakarta Cardiovascular Score on Indonesian sub-population

Maria Patricia Inggriani[1,2], Putri Fatwa Sari Tetra Dewi[3], Jajah Fachiroh[4], Luluk Dwi Yuni[5], Ade Meidian Ambari[2], Dede Kusmana[2], Anggoro Budi Hartopo[1]
[1]Department of Cardiology and Vascular Medicine, Faculty of Medicine, Public Health and Nursing, Universitas Gadjah Mada – Dr. Sardjito Hospital, Yogyakarta, Indonesia
[2]Department of Cardiology and Vascular Medicine, Faculty of Medicine, Universitas Indonesia – National Cardiovascular Hospital Harapan Kita, Jakarta, Indonesia
[3]Department of Health Behaviour, Environment and Social Medicine, Faculty of Medicine, Public Health and Nursing-Sleman Health and Demographic Surveillance System, Universitas Gadjah Mada, Yogyakarta, Indonesia
[4]Department of Histology and Cell Biology, Faculty of Medicine, Public Health and Nursing - Biobank Development Team, Universitas Gadjah Mada, Yogyakarta, Indonesia
[5]Cardiologist at Tangerang Selatan General Hospital, Tangerang Selatan, Indonesia

Background and aims: World Health Organization (WHO) has developed cardiovascular disease (CVD) risk prediction approaches using data from low-and-middle-income countries. Indonesian health professionals have been using Jakarta Cardiovascular Score (JAKVAS Score) to assess 10-year CVD risk level in populations, yet no comparison has been made. We aimed to evaluate the classification of CVD risk levels among Indonesian sub-population using 2019 WHO CVD risk charts and JAKVAS score.
Methods: It is a cross-sectional study involving 787 participants in Yogyakarta, Indonesia in 2021. Healthy participants were enrolled and 66 participants who had history of CVD were excluded. We classified participants according to the WHO CVD risk non-laboratory-based charts of Southeast Asia and it was divided into green (<5%), yellow (5% to <10%), orange (10% to <20%), red (20% to <30%), deep red (≥30%); and according to JAKVAS Score in the population into low risk (<10%), moderate risk (10% to 20%), and high risk (>20%). Both scoring systems estimate CVD events in ten-year time. Agreement between the scores was evaluated using chi-square test. Difference between other CVD risk factors not specified in the risk score and WHO risk score was tested using chi-square.
Results: We included 721 participants with an average age of 59.94±9.83 years, of which there were 47.2% (n=340) male. The median of WHO risk score in our participants was yellow risk (5% to <10%). The median of JAKVAS score was high risk (>20%). Out of 721 participants, we found significant difference between population classified using WHO CVD risk score and JAKVAS score ($p<0.001$). We found no significant differences between higher CVD risk level and several cardiovascular risk factors; such as history of diabetes mellitus, dyslipidemia, hypertension, and menopause in women ($p>0.050$). However, there were significant differences between insufficient fiber intake and low physical activity with higher classification of WHO risk score ($p=0.001$; $p=0.033$, respectively). JAKVAS score includes physical activity level in the risk stratification, which does not appear in the WHO risk score. Higher physical activity may have lowered the score risk classification of some individuals.
Conclusion: There was significantly different CVD risk prediction level between 2019 WHO CVD risk charts of Southeast Asia and JAKVAS score in Indonesian sub-population. Insufficient fiber intake and low physical activity may contribute to higher CVD risk score.

Keywords: cardiovascular risk assessment, cardiovascular risk factors, cardiovascular risk score

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Moderate and High Intensity Supervised Cardiopulmonary Exercise on Functional Capacity Improvement in Health Workers with Post Covid-19 Syndrome

Teuku Heriansyah[1]*, Muhammad Ridwan[1], Nina Widasari[1]
[1]Department of Cardiology and Vascular Medicine, Medical Faculty of Syiah Kuala University/ RSUD dr. Zainoel Abidin

Background and aims : Health workers as the front line faced a higher risk exposure to SARS CoV-2 virus due to their interaction to patients during pandemic. Person recovering from COVID-19 but still experiencing residual symptoms due to damage to the inflammatory system will experience post-COVID-19 syndrome. Properly supervised and guided physical exercise can reduce inflammation by means of recovery, called antioxidant defense mechanism. The purpose of this study was to evaluate the effect of moderate and high intensity supervised cardiopulmonary exercise on functional capacity improvement of health workers with Post-COVID-19 Syndrome.
Methods : This study used an experimental research design with sample divided into 2 groups according to age (A group: <40 years old, B group: ≥40 years). Exercise was given 12 times in a Cardiac Rehabilitation gym either with moderate and high intensity exercise.
Results : Majority of 29 Health workers with Post COVID-19 Syndrome complained fatigue to do their daily activities. $V0_2$ difference post test was 2.27; 2.98; 2.45 mL/kg/mins (p value = 0.021; 0.003; 0.002) on each group. There was no difference between moderate and high intensity on functional capacity improvement (p value= 0.496). No difference was found between systolic, diastolic blood pressure, and heart rate after exercise program either with moderate or high intensity.
Conclusion : Supervised cardiopulmonary exercise program is capable to improve functional capacity in Post COVID-19 Syndrome. Moderate intensity of supervised cardiopulmonary exercise is similar to high intensity to improve functional capacity in health workers with Post COVID-19 Syndrome.

Keyword: COVID-19, Post COVID-19 Syndrome, Supervised Cardiopulmonary exercise

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High Fat Diet Promotes Remodeling And Inflammation Of The Heart And Kidney Vasculature In The Rat By Upregulation Of Ppet-1 And Downregulation Of eNOS

Widyan Putra Anantawikrama.[1], Dwi Cahyani Ratna Sari[1], Wiwit Ananda Wahyu Setyaningsih[1], Yaura Syifanie[2], Alya Kamila[2], Reza Ahmad Rivaldo[2], Mumtaz Rizqia[2], Nur Arfian[1]
[1]Department of Anatomy, Faculty of Medicine, Public Health and Nursing, Universitas Gadjah Mada, Yogyakarta, Indonesia
[2]Medical School, Faculty of Medicine, Public Health and Nursing, Universitas Gadjah Mada, Yogyakarta, Indonesia

Background and aims : High Fat Diet (HFD) modifies several metabolic activities leading to cardiovascular diseases. The atherosclerosis induced by high fat diet alters the expression of vasodilator and vasoconstrictor agent, resulting in endothelial dysfunction. We investigated whether high fat diet (HFD) induced endothelial dysfunction, and whether this process resulted in remodeling and inflammation in the vasculature of the heart and kidney.
Methods: Rats were divided into control, rats fed on high-fat diet (HFD) for 1 month, 2 months, and 4 months. Rats were sacrificed and the heart and kidney were harvested for sample retrieval. Biomarker of endothelial dysfunction, eNOS and ppET-1 were measured by histological quantification and the quantification of mRNA using RT-PCR. Sirius Red staining was done to assess vascular remodeling and the immunohistochemistry staining of CD68 protein expression was performed to assess the localization of macrophage.
Results: HFD group body weight were higher and mRNA expression of NF-κB, MCP-1 and CD68 in the heart, particularly HFD4, were increased compared to the control group. Immunostaining of the heart vasculature revealed positive staining of macrophage in the HFD groups. Long-term HFD (HFD4) group demonstrated upregulation of ppET-1 with downregulation of eNOS mRNA expression in the heart and kidney, which promoted vascular remodeling characterized by increased wall thickness of cardiac vasculature in this group. Histological staining of kidney also showed slight tubular injury and glomerulosclerosis in HFD4 group.
Conclusion: HFD induce the upregulation of ET-1 and downregulation of eNOS and promote cardiac vascular remodeling, kidney injury and inflammation in both organs.