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Abstract: Original Research

EFFECT OF ATORVASTATIN ADMINISTRATION ON TNF- α , IL-6, AND IL-1 β LEVELS IN PERIPHERAL BLOOD MONONUCLEAR CELLS PATIENT WITH TYPE 2 DIABETES MELLITUS WITH STIMULATION OF SARS-CoV-2 SPIKE PROTEIN

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Background and Aim : The COVID-19 pandemic caused by SARS-CoV-2 virus has become a serious global problem which may lead to acute respiratory distress syndrome (ARDS). Cytokine storm is major cause of ARDS in COVID-19 patients, especially increase in TNF- α , IL-6, IL-1 β levels. Statins often used in patients with diabetes mellitus as long-term therapy and are known to have anti-inflammatory effects. Atorvastatin may lower cytokine levels especially TNF- α , IL-6, and IL-1 β and have beneficial impacts towards the pathogenesis of COVID-19. This study aimed to determine the effect of atorvastatin exposure on the expression of TNF- α , IL-6, and IL-1 β cytokines of peripheral blood mononuclear cells (PBMCs) stimulated with spike protein of SARS-CoV-2.

Materials and Methods : PBMC were isolated from peripheral venous blood by density gradient centrifugation method. Mononuclear cells were seeded on 15 well-plates, stimulated by the SARS-CoV-2 S1 protein subunit, and incubated for 24 hours. Cells with the SARS-CoV-2 spike protein stimulated were divided into four groups. Group 1 was the control group, and groups 2, 3, 4, respectively, were PBMC cells with 10 μ M, 25 μ M, and 50 μ M doses of atorvastatin. TNF- α , IL-6, and IL-1 β levels were measured in supernatant cells by using ELISA.

Result : A significant increase of TNF- α , IL-6, and IL-1 β levels in the cell group with spike protein SARS-CoV-2 stimulation indicated the transfection process was successful. However, there was no significant difference in the three atorvastatin treatment groups despite there were decrease in TNF- α and IL-6 levels and slightly increase in IL-1 β level.

Conclusion : Spike protein increase TNF- α , IL-6, and IL-1 β levels after spike protein SARS-CoV-2 stimulation. Meanwhile, atorvastatin with 10 μ M, 25 μ M, and 50 μ M doses do not reduce TNF- α , IL-6, and IL-1 β levels in peripheral blood mononuclear cells of diabetes mellitus patients with SARS-CoV-2 spike protein stimulation.

Keywords: PBMC, SARS-COV2, Spike Protein, Atorvastatin

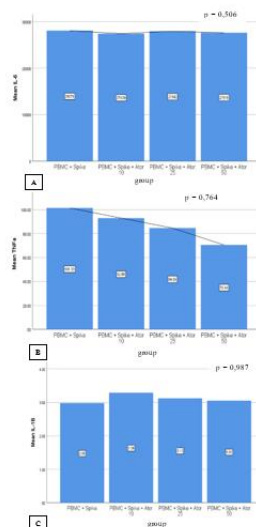
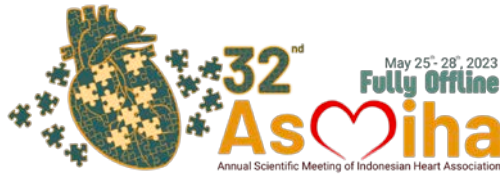


Figure 1. Differences in A. IL-6 levels B. TNF- α levels C. IL-1 β levels in all doses of atorvastatin and the control group



The Effectiveness of Integrated Service Posts for the Elderly (ISPE/Posyandu Lansia) in Optimising Hypertension Management in Indonesia

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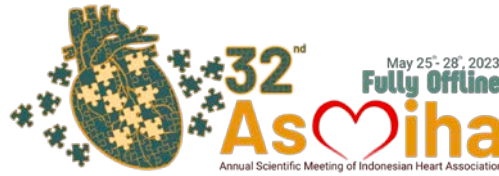
Background and aims: Hypertension is one of the leading causes of non-communicable disease death in Indonesia, in which most patients did not receive adequate therapy. Family support, unhealthy lifestyle, and access to health facilities play a role in therapy adherence. In 2020, the ratio of primary health centres (PHC) in Indonesia had already fulfilled the minimum requirement, which is one PHC for each district. In terms of controlling non-communicable diseases, the Ministry of Health establishes a community engagement program named *Pos Pelayanan Terpadu (Posyandu/Integrated Service Post)*, focusing on raising public awareness, early screening, and early detection of chronic conditions. In this research, our objective was to analyse the effectiveness of integrated service posts for the elderly (*ISPE/Posyandu Lansia*) in optimising hypertension management in the Kambowa district, North Buton regency.

Materials and Methods: This study included patients who attended ISPE in the Kambowa district during June and July 2022 consecutively. Cadres' knowledge of hypertension was evaluated from questionnaires, while patient adherence level was obtained from an interview. Blood pressure was measured before and after the health promotion program. Acquired data were analysed using Paired T-test, Wilcoxon test, and Spearman correlation test.

Results: Of 20 elderly patients visiting the posts consecutively, a significant difference in systolic blood pressure before and after the program was noticed ($p < 0.05$). A similar result was found in patient medication adherence, with a p-value of 0.001. The improvement in cadres' knowledge was rather significant with a p-value of 0.038. There was no correlation between medication adherence, blood pressure difference, and cadres' knowledge of hypertension.

Conclusion: The utilisation of ISPE affected patients' blood pressure and improved hypertension medication adherence as well as health cadres' knowledge of hypertension. Frequent contact with patients and collaboration with health cadres and other authorities may improve medication adherence.

Keywords: Hypertension, integrated service posts for the elderly, medication adherence



1-YEAR EVALUATION OF MAJOR ADVERSE CADIOVASCULAR EVENT IN HYPERTENSIVE HEART DISEASE PATIENTS AT DR. M. DJAMIL HOSPITAL, PADANG

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Background and Aim: Hypertensive heart disease refers to a constellation of changes in the left ventricle, left atrium, and coronary arteries as a result of chronic blood pressure elevation, which increases the workload on the heart inducing structural and functional changes. These changes can progress to heart failure, increase the risk of coronary artery disease, conduction arrhythmias, especially atrial fibrillation which trigger a stroke and increased morbidity and mortality. The purpose of this research is to evaluate the 1-year outcome of major adverse cardiovascular event (MACE) in hypertensive heart disease (HHD) patients at DR. M. Djamil Hospital, Padang.

Materials and Methods: This cross-sectional study was performed in 208 patients who diagnoses with HHD and performed echocardiography. The echocardiography parameters assessed including type of left ventricle geometric pattern that consist of concentric hypertrophy, eccentric hypertrophy, concentric remodeling and normal pattern. The association of left ventricular geometric pattern and MACE was analyzed with chi square in SPSS software.

Results: There are total 208 patients. Mean age of patients is 59.1 ± 13 years, with 117 patients (56%) males. The most common form of left ventricle geometric pattern was concentric hypertrophy (67%), followed by concentric remodeling (29%), and eccentric hypertrophy (2.4%). There was a significant association between MACE and Left ventricle geometric pattern ($p < 0.029$).

Conclusion: This study found significant association between MACE and left ventricle geometric pattern ($p < 0.029$). This finding should be consideration in HHD management and treatment goals.

Keywords: hypertensive heart disease, major adverse cardiovascular event, echocardiography

Left Ventricular Geometric Pattern	MAJOR ADVERSE CARDIOVASCULAR EVENT				
	Acute Coronary Syndrome (n)	Heart Failure (n)	Stroke (n)	Dead (n)	No Event (n)
Normal (n = 3)	0 (0%)	0	1	0	2
Concentric hypertrophy (n = 140)	8	37	5	6	84
Concentric remodeling (n = 60)	7	13	1	1	38
Eccentric hypertrophy (n = 5)	1	3	0	1	0
Total	16	53	7	8	124

Left Ventricular Geomatic Pattern Distribution Base on MACE



The Association between Coagulation Parameters, C-Reactive Protein, D-dimer and In-hospital Mortality of COVID-19 Patients with Suspected Pulmonary Embolism

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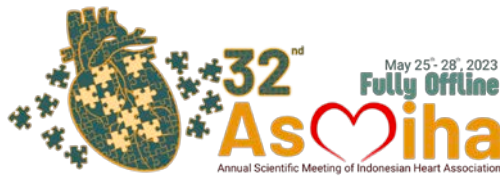
Background and aims: COVID-19 is a respiratory disease with cardiovascular complications, one of them is pulmonary embolism (PE). Studies have shown many factors related to mortality of COVID-19 patients with PE. This study aimed to find the association between coagulation parameters (PT and APTT), C-reactive protein (CRP), and D-dimer with in-hospital mortality of COVID-19 patients with suspected PE.

Materials and methods: This retrospective cohort study included COVID-19 patients in RSUD Ulin Banjarmasin during June 2020-January 2021 with suspected PE and anticoagulant therapy. The independent variables were PT, APTT, CRP, D-dimer, and the dependent variable was in-hospital mortality. The association between these variables were analyzed with logistic regression, with α value of 0.05.

Results: A total of 91 patients were included, with most patients were females (59.3%), average age of 53.36 years, average BMI of 25.82 kg/m², having normal electrocardiogram (79.1%), with history of hypertension (56%), and no histories of smoking (94.5%), diabetes mellitus (70.3%), heart failure (93.4%), coronary artery disease (96.7%), and chronic lung disease (95.6%). The percentage of in-hospital death was 39.57%. Unadjusted analysis showed significant increased levels of PT, APTT, and CRP in deceased patients compared to those discharged alive (14.62 vs 11.91 seconds, 42.94 vs 28.57 seconds, and 98.19 vs 47.01 mg/dL, respectively; $p < 0.01$), and a non-significant increased level of D-dimer (10.89 vs 5.21 mg/L; $p = 0.09$). Multivariate logistic regression showed non-significant associations between PT, APTT, D-dimer, and CRP with in-hospital mortality (p values of 0.06, 0.14, 0.52, and 0.23, respectively).

Conclusion: There is no association between coagulation parameters, CRP, and D-dimer levels with in-hospital mortality in COVID-19 patients with suspected PE. A further study with a larger sample size is needed to see the role of laboratory findings in predicting in-hospital mortality in COVID-19 patients with suspected PE.

Keywords: COVID-19, Pulmonary embolism, In-hospital mortality



Associated Risk Factors of Acute Coronary Syndrome In The Regional District General Hospitality of Sanjiwani Gianyar

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Background and Aims:

Acute coronary syndrome (ACS) is defined acute partial to total coronary blood flow to the myocardium. Risk factors ACS are hypertension, dyslipidemia, duration of smoking, number of cigarettes, obesity, diabetes mellitus, hyperuricemia, age, sex, family history. ACS is a disease that is closely related to an unhealthy lifestyle, therefore real behavior is needed accompanied by good attitudes and knowledge to avoid the risk factors for this disease. To evaluate the risk factors in ACS, this study was conducted.

Methods :

This is an analytical, case-control study was a prospective study with total of 100 ACS patients during 2019. The ACS samples were divided into three groups namely STEMI, NSTEMI, and UAP. The sample in this study was ACS patients by fulfilling the inclusion criteria and selected by consecutive sampling. Univariate analysis was conducted to assess the characteristics of the research subjects. Bivariate inferential analysis was conducted to analyze the association of risk factors to the incidence of ACS using chi-square. The logistic regression model was used for the multivariate analysis to assess the magnitude of variables on ACS.

Results :

100 patients ACS were included. The result of three stage analysis is. (1) ACS occurred in 100 ACS hospitalization more common in males (54%) and aged 40 years old (85%). (2) In bivariate analysis, duration of smoking, number of cigarettes, dyslipidemia, hypertension, diabetes mellitus, obesity, hyperuricemia were found to be significantly associated. (3) Through logistic regression for the multivariate analysis, we found that ACS hospitalization was associated obesity (OR: 7.42; 95%CI: 1.48-37.11; p = 0.015), and hypertension (OR: 0.13; 95%CI: 0.03-0.53; p = 0.005).

Conclusion :

The presence of ACS was associated with a significant increase of hospitalization were obesity and hypertension are risk factors of ACS hospitalization.

Keywords: Acute coronary syndrome, risk factors, bivariate, multivariate

Characteristics of Research Subjects and Bivariate Analysis Risk Factors of ACS

Variable	Sample (20.0%)	n (%)	p-value
Demographic			
Gender			
Male	54 (27.0%)	54 (54.0%)	0.001*
Female	46 (23.0%)	46 (46.0%)	
Age			
<40 years	15 (7.5%)	15 (15.0%)	0.001*
40-50 years	55 (27.5%)	55 (55.0%)	
>50 years	30 (15.0%)	30 (30.0%)	
Obesity			
Yes	15 (7.5%)	15 (15.0%)	0.001*
No	85 (42.5%)	85 (85.0%)	
Hypertension			
Yes	15 (7.5%)	15 (15.0%)	0.001*
No	85 (42.5%)	85 (85.0%)	
Diabetes mellitus			
Yes	15 (7.5%)	15 (15.0%)	0.001*
No	85 (42.5%)	85 (85.0%)	
Hyperuricemia			
Yes	15 (7.5%)	15 (15.0%)	0.001*
No	85 (42.5%)	85 (85.0%)	

Characteristics of Research Subjects and Bivariate Analysis Risk Factors of ACS

Variable	Sample (20.0%)	n (%)	p-value
Demographic			
Gender			
Male	54 (27.0%)	54 (54.0%)	0.001*
Female	46 (23.0%)	46 (46.0%)	
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<40 years	15 (7.5%)	15 (15.0%)	0.001*
40-50 years	55 (27.5%)	55 (55.0%)	
>50 years	30 (15.0%)	30 (30.0%)	
Obesity			
Yes	15 (7.5%)	15 (15.0%)	0.001*
No	85 (42.5%)	85 (85.0%)	
Hypertension			
Yes	15 (7.5%)	15 (15.0%)	0.001*
No	85 (42.5%)	85 (85.0%)	
Diabetes mellitus			
Yes	15 (7.5%)	15 (15.0%)	0.001*
No	85 (42.5%)	85 (85.0%)	
Hyperuricemia			
Yes	15 (7.5%)	15 (15.0%)	0.001*
No	85 (42.5%)	85 (85.0%)	

Efficacy of Ganoderma Lucidum Polysaccharide Peptides As Anti-Hypertension Anti-Inflammation and Improving Left Ventricular Diastolic Function In Hypertensive Patients

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Background and aims

In arterial hypertension, left ventricular hypertrophy (LVH) includes myocyte hypertrophy and fibrosis, which lead to left ventricular diastolic dysfunction (LVDD) heart failure. This study for evaluate the anti-hypertensive and anti-inflammatory properties of Indonesian Ganoderma lucidum polysaccharide peptide (GLPP), and its potential to improve diastolic function in hypertensive patients.

Material and methods

A randomized, double-blind, placebo-controlled clinical trial was conducted with 90 hypertension with LVDD patients in participation. The patients were divided into two groups: Control Group (CG), which received placebo; and Intervention Group (IG) which received 750 mg GLPP divided in 3 doses at 60 days. all patients received basic medical treatment for hypertension according INASH guideline. We measured the inflammatory markers and echocardiography was performed before and after treatment by two blinded observer.

Results

After 60 days, GLPP significantly reduced TNF- α level compared with placebo (-1.41 ± 1.3 vs. -0.42 ± 1.05 , $p = 0.008$). hs-CRP and IL-1 concentrations were significantly lower compared with placebo (-1.23 ± 1.11 vs. -0.67 ± 0.6 , $p = 0.000$ and -1.96 ± 1.8 vs 0.97 ± 2.7 , $p = 0.000$, respectively). IG presented increase in E/A ratio (0.71 ± 0.18 to 0.82 ± 0.21 , $p = 0.001$), decrease of interventricular septum diameter (0.98 ± 0.2 to 0.86 ± 0.16 , $p=0.015$), posterior wall diameter (1.01 ± 0.2 to 0.86 ± 0.16 , $p = 0.009$), left ventricular internal diameter (4.8 ± 0.4 to 4.54 ± 0.47 , $p = 0.005$), left ventricular mass index (103 ± 25.2 to 81.9 ± 15.3 , $p = 0.001$), and regional wall thickness (0.43 ± 0.14 to 0.39 ± 0.10 , $p = 0.04$), as compared with CG.

Conclusion

GLPP administration significantly improved the diastolic function and reduction in LV geometry due to anti-inflammatory effect by reducing TNF- α , hs-CRP and IL-1 concentrations

Keywords: Ganoderma lucidum, Diastolic function, Hypertension

Variable	IG		CG		Variation		P
	Before treatment	After treatment	Before treatment	After treatment	IG	CG	
SBP	159.2±16.1	139.29±12.2	148.0±13.5	138.79±14.8	-19.95±17.4	-9.25±12.7	0.02
DBP	87.51±12.9	81.43±7.27	87.6±9.9	83.67±9.5	-6.14±8.6	-3.96±10.7	0.46
HR	82.5±15.5	73.95±9.7	76.08±12.5	76.54±13.3	-8.48±11.05	0.46±5.4	0.001
Cholesterol	204±43.9	183.33±29.9	196±36	195.79±33.6	-20.67±46.5	-0.67±25.7	0.09
TG	158±91	149.71±72.3	144.5±90.7	145.38±59.7	-8.57±90.2	0.83±50.9	0.67
HDL	47.3±14.2	48.06±13.8	46.9±12.2	47.50±8.7	0.73±9.6	0.56±8.26	0.94
LDL	112±36.3	91.76±27.4	112±29.9	110.79±32.9	-21.18±27.4	-1.22±22.6	0.011
HBA1C	6.08±1.7	6.02±1.2	6.5±1.3	7.37±1.9	-0.07±1.0	0.81±1.9	0.06
Nitric oxide	34.8±10.9	25.52±8.3	38.9±16.8	38.13±16.7	-9.32±11.7	-0.79±3.6	0.004
MDA	19.6±14.4	12.40±9.2	17.0±8.9	22.50±9.4	-7.23±14.6	5.45±10.4	0.001
HSCRP	2.83±0.10	1.59±0.6	2.80±0.13	2.74±1.42	-1.23±1.11	-0.67±0.6	0.00
TNF	3.91±0.89	2.50±1.16	3.57±0.83	3.14±1.1	-1.41±1.3	-0.42±1.05	0.008
IL1	9.96±2.6	8.0±2.1	8.4±2.9	9.3±3.4	-1.96±1.8	0.97±2.7	0.000
SOD	3.17±0.58	3.36±0.59	2.9±0.54	2.58±0.65	0.19±0.76	-0.42±0.68	0.007
Echocardiography Measurement							
LVEF	62.5±9.0	66.3±7.4	66.2±10.3	64.7±12.2	3.85±6.5	-1.46±9	0.012
E/A	0.71±0.18	0.82±0.21	0.73±0.1	0.73±0.10	0.10±0.1	-0.0±0.09	0.001
E velocity	0.65±0.12	0.66±0.12	0.63±0.14	0.69±0.16	0.02±0.1	0.05±0.17	0.53
A velocity	0.91±0.21	0.83±0.18	0.87±0.19	0.95±0.25	-0.08±0.2	0.08±0.24	0.026
LAVi	26.45 ± 2.85	23.20 ± 1.45	24.48 ± 1.76	25.08 ± 1.22	-3.25±1.4	0.6±0.54	0.042
e' lateral	0.09±0.023	0.09±0.02	0.088±0.015	0.07±0.01	0.003±0.22	-0.001±0.017	0.38
e' septal	0.071±0.017	0.10±0.16	0.064±0.014	0.06±0.01	0.03±0.15	0.0004±0.019	0.35
E/e'	8.13±15.2	7.0±1.1	8.32±21.8	9.12±2.0	-1.0±1.1	0.8±2.0	0.09
IVSd	0.98±0.2	0.86±0.16	1.05±0.18	1.1±0.18	-0.11±0.26	0.05±0.18	0.015
PWd	1.01±0.27	0.86±0.16	1.01±0.23	1.1±0.18	-0.15±0.35	0.09±0.22	0.009
LVDDd	4.8±0.42	4.54±0.47	4.5±0.44	4.6±0.53	-0.25±0.37	0.12±0.46	0.005
LVMI	103±25.2	81.9±15.3	102±27.6	112±27.3	-21.9±25.0	10.3±14.7	0.001
RWT	0.43±0.14	0.39±0.10	0.44±0.11	0.47±0.1	-0.03±0.08	0.02±0.11	0.04

The results of inflammatory marker and echocardiographic examination during the experimental treatment were summarized in this table



The Benefits of a Comprehensive Heart Failure Management Program in a Developing Country: Single-Center Study

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Background and Aim

Heart failure has emerged as a major public health problem, affecting 38 million people worldwide with high readmission and mortality rates, and causing a substantial economic burden. A comprehensive heart failure (HF) management program has been shown to decrease these problems. The lack of HF management programs leads to suboptimal treatment in most developing countries. This study was conducted to reveal the benefits of a comprehensive HF management program in a developing country in Indonesia.

Materials and Methods

Up until December 2022, medical records from Heart Failure (HF) clinic patients were used as secondary data for this observational study. By using a purposive sampling technique, we enrolled HF patients with reduced left ventricular systolic function based on LVEF <40% and who had undergone ≥ 12 months of treatment at the HF Clinic, RSUP dr. Hasan Sadikin, Bandung. The patients' clinical status and functional capacity were analyzed using the paired Wilcoxon Signed-Rank test, and rehospitalization history was analyzed using the McNemar test.

Results

Ninety-three patients met the inclusion criteria, aged 54 ± 12.16 with 65 males (69.09%). The mean LVEF at baseline was $26.6 \pm 6.7\%$. At the first appointment, most of the patients (46%) were in New York Heart Association (NYHA) functional class III. The majority of cases of heart failure (47.3%) had ischemia as the underlying cause, while 46.2% had non-ischemia and 6.5% had mixed causes. A history of smoking (59.1%) is the most common risk factor. A total of 66.7% of the patients reached optimal medical therapy, with the most frequently prescribed drug is beta-blockers (97.8%). After ≥ 12 months of follow-up, hospitalization rates dropped considerably to 21% ($p < 0.001$), patient LVEF improved to $37.3 \pm 10.7\%$ ($p < 0.001$), and all patients' functional status improved to 53% NYHA I, 37% NYHA II, and 7% NYHA III ($p < 0.001$).

Conclusion

A comprehensive HF management program has been shown to reduce the rehospitalization rate, enhance clinical outcomes, and subsequently optimize HF medical treatment in a single center of a developing country. Larger and longer-term studies are required to investigate the long-term advantages and potential cost-effectiveness of the HF management program as a benefit of the HF management program.

Keywords: Heart Failure (HF) Management Program, Rehospitalization, Optimal Medical Therapy (OMT)



Left Ventricular Deformation Using 2D Speckle Tracking Echocardiography With LV Geometry Pattern in Hypertension Patients

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Background and Aims: Hemodynamic patterns in hypertensive patients lead to alterations in the geometry responses which may be used as a parameter to identify changes in left ventricular deformation. Global longitudinal strain (GLS) values on two-dimensional speckle tracking echocardiography (2DSTE) examinations are able to detect it early, allowing appropriate antihypertensive medications to be administered promptly to prevent future heart failure. We intend to determine the correlation between left ventricular deformation using 2DSTE with the type of LV geometry in hypertensive patients.

Materials and Methods: This cross-sectional study in hypertension patients was conducted at Dr. M. Djamil Hospital Padang. All subjects underwent an echocardiography examination. The association of left ventricular deformation with LV geometry pattern was assessed using the T-test.

Results: There were 94 patients with arterial hypertension included in this study. We identified 32 concentric LV remodeling cases, 53 concentric LV hypertrophy cases, and 9 eccentric LV hypertrophy cases. None of our subjects had normal LV geometry pattern. Based on 2D echocardiographic parameters, left atrial volume index largest value was found in the eccentric hypertrophy group $34.7 \pm 14.7 \text{ vol/m}^2$, and statistically significant between all groups ($p < 0.001$). LV mass index gradually increased from patients with concentric remodeling, concentric hypertrophy to individuals with eccentric hypertrophy. Lower LV ejection fraction was noted in eccentric LV hypertrophy. Each group has normal left ventricular filling pressure. 2DSTE analysis showed decreased mean GLS values in all groups, with the lowest value (-11.9 ± 4.6) noted in eccentric hypertrophy and statistically significant with a p -value < 0.001 .

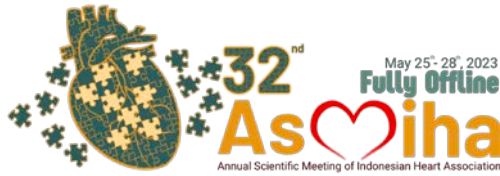
Conclusion: Subjects with arterial hypertension had lower global longitudinal strain values despite having normal LV ejection fraction in all types of LV geometry patterns. There was a statistically significant difference in GLS value based on LV geometry pattern in hypertension patients.

Keywords: Hypertension, Left ventricular geometry, 2D speckle tracking echocardiography, Global longitudinal strain

Table 1. Relationship of left ventricular global longitudinal strain with left ventricular geometry pattern in the study population

Variables	Concentric LV Remodeling (n=32)	Concentric LV Hypertrophy (n= 53)	Eccentric LV Hypertrophy (n = 9)	Total (n= 94)
Mean GLS (%)*	-17.6 ± 3.2	-15 ± 4.1	-11.9 ± 4.6	< 0.001

*Mean \pm SD, GLS = Global Longitudinal Strain



Comparison of Six-Minute Walk Test Distance and Metabolic Equivalents in Single vs Multi-vessel Disease Group in Patients who Underwent Coronary Revascularization

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Background and aims:

Coronary Artery Disease (CAD) is still the leading cause of mortality worldwide. After Percutaneous Coronary Revascularization (PCI) era, multi-vessel disease still commit worse prognosis compared to single-vessel disease. Six-minute walk test (6-MWT) is a simple test to assess cardiopulmonary capacity and prognosis in CAD patients. This cost-effective test could be performed easily before patients discharge. Metabolic equivalents (METs) also being calculated to predict daily activity limit and target for the cardiac rehabilitation program. We conducted this study to compare 6MWT distance and METs in patients with single and multi-vessel disease who underwent coronary revascularization.

Materials and Methods :

This is a cross-sectional study with total 360 CAD patients in Prof R.D. Kandou General Hospital Manado who underwent PCI from July 2019 to December 2022. Coronary revascularization were performed and patients were divided into single-vessel group and multi-vessel group. Before discharge, patients were instructed to walk at their own pace within six minutes. Comparison between 6MWT distance and METs in single vs multi-vessel group were analyzed using Mann-Whitney Test.

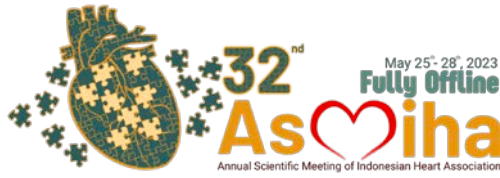
Results :

The mean age of patients were 60 years old. Most of them were male (84%). 6MWT distance and METs were significantly higher in single vessel disease patients compared with multivessel disease patients ($p= 0.045$ and 0.010 respectively).

Conclusion :

Six-minute walk test distance and METs were higher in patient who had single-vessel disease compared to multi-vessel disease. The 6MWT is simple, non-invasive test and easily performed in any hospital to help determine patient's daily activities.

Keywords: Six-Minute Walk Test, Metabolic Equivalents, Coronary Artery Disease, Multi Vessel Disease, Coronary Revascularization



	Single VD (N=114)	Multi VD (N=246)	P Value
6MWT distance	315.86±66.25	295±77.03	0.045
METs	5.74±1.7	5.17±1.54	0.01

VD= Vessel Disease

Table 1. Comparison Between Six-Minute Walk Test Distance and Metabolic Equivalents

Exploring the Role of MiRNAs in PAH-Related Signalling Pathway with Bioinformatic Tools

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Background and Aims :

BMP2 signalling pathways have been greatly associated with pulmonary arterial hypertension (PAH). Alterations of protein expressions involved in these pathways could contribute to the progression of PAH. MicroRNAs (miRNAs) are short non-coding RNAs that regulate gene expression via the repression of messenger RNA, and consequently regulating numerous downstream biological processes. Various miRNAs that affect the level of proteins in BMP pathways have been discovered. However, analysing all available data can be difficult. Fortunately, bioinformatics resources provide new approaches to exploring the roles of miRNAs in molecular pathways involved in cardiovascular diseases. Therefore, this study aimed to investigate the role of miRNAs in the BMP2 signalling pathway related to PAH pathogenesis by using bioinformatic tools, specifically Gene Ontology.

Materials & Methods :

We curated peer-reviewed articles on miRNAs targeting genes in the BMP2 signalling pathway; *BMP2*, *BMPRIA*, *BMPR1B*, *BMPR2*, *SMAD1*, *SMAD4*, *SMAD5*, by following the Gene Ontology guidelines. Molecular interaction networks were then created, followed by functional enrichment analysis of the network using Cytoscape version 3.9.

Results :

A total of 20 articles describing 25 miRNAs targeting seven genes involved in the BMP2 signalling pathway were annotated. A network of miRNAs and protein interactions was created based on these annotations. Twenty-one miRNAs were discovered to regulate downstream biological processes relevant to PAH. Enrichment analysis showed eight miRNAs were associated with the significantly enriched term “regulation of smooth muscle cell proliferation” ($p < 0.05$) and eight miRNAs with “regulation of endothelial cell proliferation” ($p < 0.05$).

Conclusion :

The network created in this *in silico* study was able to describe the potential roles of various miRNAs in the BMP2 pathway. Further expansion of this *in silico* study will provide more opportunities for future research exploring molecular pathogenesis and therapeutic opportunities of PAH.

Keywords: Pulmonary arterial hypertension, miRNA, BMP signalling pathway, bioinformatics, Gene Ontology

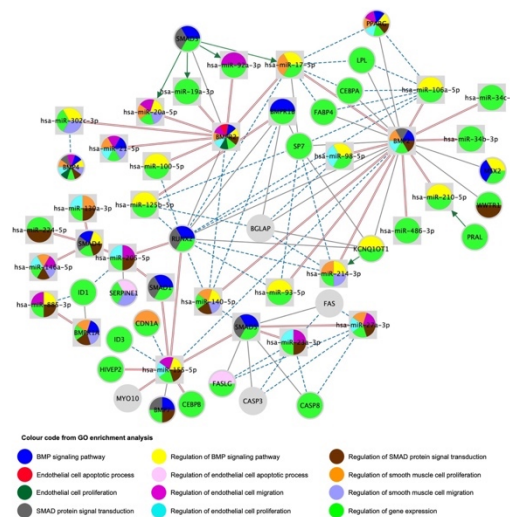
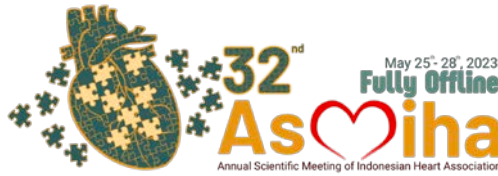


Figure 1. Network of miRNAs-proteins interactions and overlaid with GO terms during GO enrichment.



Efficacy of Morning vs Evening Bisoprolol Intake in Fast-Rate Dependent Premature Ventricular Complex: A Double-Blind Randomized Crossover Trial

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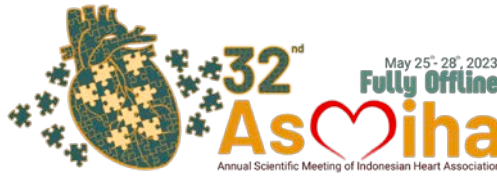
Background and Aim: Fast-rate dependent premature ventricular complex (F-HR-PVC) is one of premature ventricular complex (PVC) circadian variation which occurrence increases linearly with baseline heart rate. The mechanism involved is considered related to the circadian mechanism which includes autonomic nerve system and catecholamine levels. The presence of circadian variation in PVC raise the potential of chronotherapeutic approach in treating PVC.

Material and Methods: This is a double-blind randomized crossover trial with a total subject of 23 patients who have F-HR-PVC with 24-hr PVC burden $\geq 5\%$ and PVC burden variability $>35\%$. Subjects were divided into two sequence groups. Those in sequence 1 were given bisoprolol in the morning in the first week, crossed over then followed by the administration of evening bisoprolol in the second week. Meanwhile, those in sequence 2 received alternate treatment. 24-hour Holter evaluation was done and analyzed to compare the efficacy of bisoprolol administration with chronotherapeutic approach toward clinical endpoints. The primary outcomes were PVC burden and PVC burden variability between morning bisoprolol and evening bisoprolol while the secondary outcomes were success rate and mean reduction in PVC burden of either morning or evening bisoprolol.

Results: There is no significant difference between morning and evening administration of bisoprolol on both PVC burden (*treatment effect* -0,06 [-4,12 – 4,00]; CI 95%, p = 0,976) and PVC burden variability (*treatment effect* 6,34 [-10,41 – 23,08]; CI 95%, p = 0,439) for 24 hours. Success rate of reducing PVC burden in morning dose and evening dose of bisoprolol in F-HR-PVC are 73,9% (mean reduction 30,4%) and 68,2% (mean reduction 39,9%) respectively.

Conclusion: There was no difference in the efficacy of giving bisoprolol in the morning compared to the evening dosing on the PVC burden and the variability of PVC burden for 24 hours.

Keywords: idiopathic ventricular premature contraction, PVC burden, PVC burden variability.



Association Between Triglyceride Glucose Index and Left Ventricular Systolic Function in Patients with ST Elevation Myocardial Infarction Underwent Primary Percutaneous Coronary Intervention

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Background and Aims:

Acute coronary syndrome is the leading cause of morbidity and mortality from cardiovascular disease worldwide. Insulin resistance, a hallmark of metabolic syndrome, is not only associated with an increased risk of cardiovascular disease but also significantly correlated with a higher risk of MACCE. The triglyceride glucose (TyG) index has been considered a new biomarker for the diagnosis of Angio-cardiopathy and insulin resistance and found to be well correlated with coronary artery disease. This study aimed to investigate the relationship between the TyG index and left ventricular systolic function patient with ST elevation myocardial infarction (STEMI) underwent primary percutaneous coronary intervention (PPCI).

Materials and Methods:

This study enrolled 56 patients with STEMI underwent PPCI from April 2022 until December 2022. Triglyceride (TG) and fasting plasma glucose (FPG) concentrations taken during the stay in the hospital, which were obtained after 12 h of fasting. The TyG index was calculated as $\ln [\text{fasting TG (mg/dL)} \times \text{FPG (mg/dL)} / 2]$. Left ventricular systolic function was analyzed using biplane Simpson's method before hospital discharged. Association between TyG index and left ventricular systolic function were analyzed using Pearson Correlation test.

Result:

The mean age of patients were 56 years old, 94.7% were male and 26.8% were diabetes mellitus. Pearson analysis indicated higher TyG index associated with lower left ventricular ejection fraction ($p < 0.05$).

Conclusion:

This study showed higher TyG index was associated with lower left ventricular ejection fraction in patients with STEMI. Insulin resistance plays a crucial role in the pathophysiology of cardiac dysfunction and atherosclerosis so it can be a novel target for prevention and treatment.

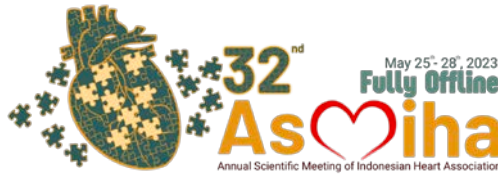
Keywords: Triglyceride-Glucose Index, LV ejection fraction, ST elevation, Percutaneous Coronary Intervention

Tests of Normality							Correlations			
Kolmogorov-Smirnov ^a			Shapiro-Wilk						TyGIndex	EF
	Statistic	df	Sig.	Statistic	df	Sig.				
TyGIndex	.069	56	.200*	.988	56	.830	TyGIndex	Pearson Correlation	1	-.349**
								Sig. (2-tailed)		.008
								N	56	56
LVEF	.093	56	.200*	.980	56	.488	EF	Pearson Correlation	-.349**	1
								Sig. (2-tailed)	.008	
								N	56	56

*. This is a lower bound of the true significance.
a. Lilliefors Significance Correction

** Correlation is significant at the 0.01 level (2-tailed).

Pearson Correlation Test



PROLONGED CLOTTING TIME AS A PREDICTOR OF PROLONGED LOS AND SEVERITY IN COVID-19 INPATIENTS WITH HYPERTENSION

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Background and aims Hypertension remains as one of the risk factors for COVID-19 infection, it also plays a role on haemostasis and roles of blood coagulation products in the clinical course of hypertension.

Coagulopathy and thromboembolic events were stated as one of the major complications during COVID-19 infection. Abnormal coagulation parameters were indicated among the most significant biomarkers of poor prognosis in COVID-19 inpatients. This study aims to evaluate the prognostic value of Pro Thrombin and Activated Partial Thromboplastin Time for COVID-19 inpatients with Hypertension.

Materials and Methods This observational-descriptive with cross-sectional design study enrolled 70 Hypertensive Covid-19 inpatients. Data was collected during their admission to the Surabaya Field Hospital that includes systolic blood pressure (SBP), diastolic blood pressure (DBP), pro thrombin (PT), activated partial thromboplastin time (APTT), length of stay (LoS), and severity. Hypertension was defined as SBP \geq 140 mmHg and/or DBP \geq 80 mmHg. Prolonged clotting time was defined as PT \geq 14.2 sec and/or APTT \geq 35 sec. LoS was calculated during their first day admission to the observational ward and classified as \geq 5 days for prolonged LoS. Severity was defined by their condition during their admission including clinical manifestation such as respiratory distress syndrome, and the use of breathing apparatus. Statistics were performed on SPSS version 25 and cross-tabulation test was performed on the clotting time, severity, and LoS in a table form.

Result Result of the cross-tabulation test of the prolonged clotting time with the severity and LoS showed association with severity (OR=1.654; p=0.007), and prolonged LoS (OR=1.229; p=0.024).

Conclusion Hypertensive COVID-19 inpatients with prolonged clotting time showed more risk in contracting severe COVID-19 infection and more risk of prolonged LoS among Hypertensive COVID-19 Inpatients.

Keywords: Hypertension, COVID-19, Clotting Time, Risk Factors.

Variables	Clotting Time				Sig.	OR	95% CI	
	Normal		Prolonged				Lower Bound	Upper Bound
Severity	n	%	n	%				
a. Moderate	16	22.8	3	4.2	0.024	4.741	1.229	18.29
b. Severe	27	38.5	24	34.5				
Length of Stay	n	%	n	%				
a. < 5 days	19	27.4	3	4.2	0.007	6.333	1.654	24.252
b. > 5 days	24	34.2	24	34.2				

The Effect Of Moderate UV Index Exposure To Blood Pressure In Hypertensive Patient: A Pre-Experimental Study

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Background and Aims: Most guidelines emphasize the importance of controlling risk factors. Previous studies have suggested that sun exposure could reduce CVD risk. However, direct and long-term sun and UV exposure may be detrimental to skin health; hence, this study tested the effect of a moderate UV Index on blood pressure in hypertensive and normal/pre-hypertensive patients.

Materials and Methods: We studied 18 patients, consisting of nine patients in each normal/pre-hypertensive and hypertensive groups. This pre-experimental study was performed at Dompu Public Hospital, Indonesia. The patients were asked to sun-bathing at 6-8 am for 15-30 minutes exposing their heads, arms, and feet. Prior to and after the experiment, BP was recorded by office blood pressure methods recommended by the ACC/AHA three times to obtain a better result. The patients were asked to record the time and duration of sunbathing for 14 days.

Result: Female patients comprised 56% of the population with a mean age of 53.61 ± 8.01 years. the average SBP reduction was -5.22 ± 4.72 mmHg, the DBP reduction was -2.28 ± 1.93 mmHg. The mean UV index and Equivalent UV dose were 3.98 ± 0.29 and 129.95 ± 12.43 J/m². Multivariate analysis showed a significant result for the exposure time-adjusted UV index to SBP, but not DBP ($p=0.0006$) (Fig.1), with no significant difference between the two groups. Age and sex had no significant effect on blood pressure.

Conclusion: Although the equivalent UV dose was low, it still had a favorable effect and was safe for the Indonesian skin type. Assuming that people with normal blood pressure have normal Vitamin D levels, it may be suggested that the antihypertensive effect of UV exposure via nitrite oxide released upon contact with the skin, which induces vasodilatation or photorelaxation.

Keywords: sun exposure, UV index, blood pressure, hypertension

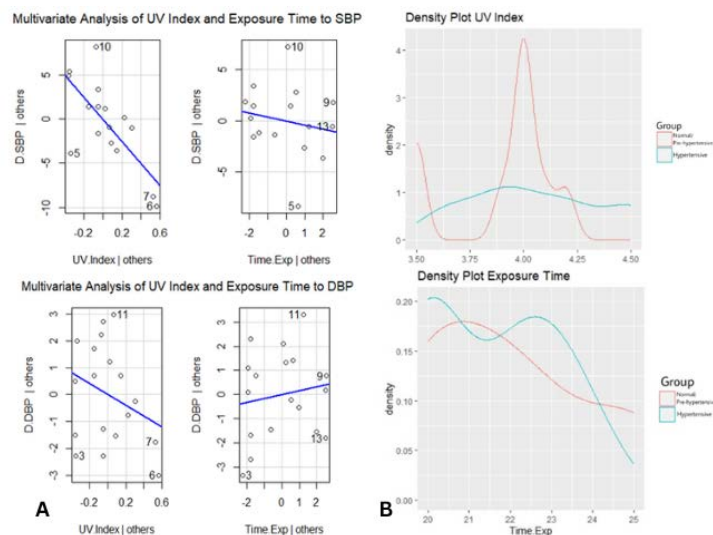


Fig. 1 A) Multivariate analysis of time-adjusted UV index to SBP and DBP; B) Density plot of UV index and exposure time

Perindopril and Losartan Attenuate Coagulation Factors in COVID-19-Related Pro-Thrombotic State: Is ACE2 a New Player in the Cascade?

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Background and aims

Thrombotic events are highly prevalent in COVID-19, especially in patients presenting with risk factors of adverse outcomes such as obesity. The specific underlying mechanism, in which pro-coagulation factors activities play a role, remains an area of investigative interest. Recently, the associations between the ACE2 pathway and thrombosis have been reported. ACE inhibitors and ARBs are widely used cardiovascular pharmacologic agents that upregulate ACE2 levels, and their use in COVID-19 appears counter-intuitive as ACE2 receptors act as the binding site of SARS-CoV-2. An observation of the alterations in pro-coagulation factors after exposure to ACE inhibitors and ARBs may provide valuable insight into the thrombosis mechanism and how it may relate to ACE2.

Methods

Adipose tissue harvested from an obese male donor was isolated and exposed to a) 0.7 μ M Perindopril, b) 0.5 μ M Losartan, and c) 100 μ g/mL of ACE2 recombinant as binding assay, following infection with 10 nm of SARS-CoV-2 S1 spike protein. After 48 hours, tissue factor (TF) and plasminogen activator inhibitor-1 (PAI-1) as pro-coagulation factors as well as ACE2 levels and binding evaluated.

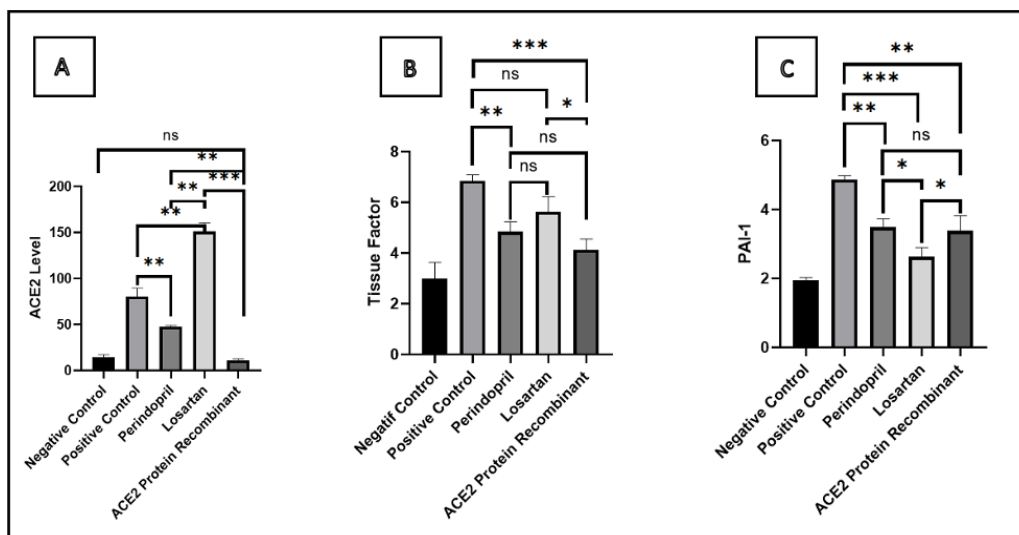
Results

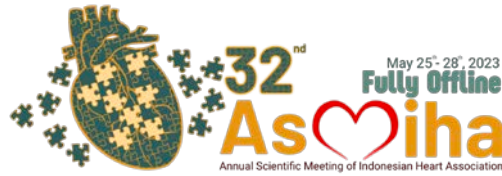
TF level was significantly reduced in Perindopril group compared to control (4.834; $p=0.005$), while a non-significant reduction was observed in Losartan group (5.624; $p=0.111$). However, Losartan group showed a better reduction of PAI-1 levels (2.633; $p=0.000$) than Perindopril group (3.834; $p=0.001$). These findings were consistent with the observations in ACE2 recombinant group, suggesting that both drugs lowered the bindings of ACE2 and SARS-CoV-2 spike proteins.

Conclusion

This study indicated that both Perindopril and Losartan may attenuate pro-coagulation factors in COVID-19, and therefore showcased a potential role of ACE2 in the mechanism of COVID-19-related thrombosis. Further investigation in non-COVID-19 populations should commence and may be of value to expanding this potential in general cardiovascular diseases.

Keywords: Perindopril, Losartan, ACE2, COVID-19, Thrombosis





BODY MASS INDEX EFFECT ON SIX-MINUTE WALKING TEST IN POST PERCUTANEUS CORONARY INTERVENTION WITH MID RANGE EJECTION FRACTION : BIGGER IS BETTER?

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Background and Aim

Obesity cause increased in both metabolic and cardiovascular disease. On the other side, it has protective effect and survival benefit in patients that already diagnosed with Heart Failure, myocardial infarction and after coronary artery bypass surgery. Several study showed that obese walked shorter distances than non-obese in preserved left ventricular ejection fraction. This study aim to find out the correlation of Body Mass Index (BMI) and six minute walking distance in mid-range ventricular ejection fraction in post percutaneous coronary intervention subjects.

Materials and Methods

Data were collected from Post PCI patients with midrange ejection fraction that had been done 6 minute walking test before discharge at RSUP Prof. Dr. R. D. Kandou, Manado start from January 2021 to January 2023 with total of 120. BMI and six-minute walking distance data were analyze using SPSS to find out the correlation.

Result

There were 81.6% male from total subject. Six-minute walking distance showed Mean 296.38 meters, (165-500 meters). BMI showed Mean 24.2 (18.3-29.4). Correlation of BMI and six-minute walking distance showed significant correlation with P Value 0.012 and Correlation Coefficient 0.229.

Conclusion

This study showed significant correlation between BMI and six-minute walking distance with higher BMI subject can reach longer distance in six-minute walking test. It support previous study that increase BMI in reduce ejection fraction showed better outcome. Therefore, maintain body weight normal to overweight BMI should be considered for better outcome in heart failure with mid-range ejection fraction.

Keywords: 6MWT, BMI, PCI, mid-range EF



Is E-cigarette a Safe Alternative for Smoker? A Comparative Study of E-cigarettes and Non-E-cigarettes Effect on Blood Pressure

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Background and Aim: Electronic cigarettes (e-cigarettes) were emergingly assumed and advertised as a safer and healthier alternative compared to conventional cigarettes in the late 2000s. It vaporized a solution that contain nicotine. Waves 3 PATH Study was found the association between e-cigarettes and self-reported hypertension, similar magnitude to conventional cigarettes. Few studies demonstrated that nicotine in E-cigarettes had potent sympathomimetic effects which increased arterial stiffness and affected on increasing blood pressure. This study was conducted to analyse the effect of e-cigarettes on blood pressure.

Material and Methods: 42 young population with age < 35 years old were evaluated for systolic and diastolic blood pressure from November 2021 to January 2022. Patient with active smoking, familial history of hypertension, taking antihypertensive drugs and secondary hypertension were excluded. They filled the application form and on the same time blood pressure measurement was performed. Blood pressure between two groups was analysed with independent T-test.

Results: Among 42 young and healthy patients, 88% was male with the mean age 29 years old, 21 patients (50%) were using e-cigarettes and 21 patients (50%) had never smoked. In Patient using e-cigarettes, mean systolic blood pressure was 132 ± 10.8 mmHg and mean diastolic blood pressure was 82.7 ± 7.0 mmHg while in patient never used e-cigarettes had mean systolic blood pressure 118 ± 6.7 mmHg and mean diastolic blood pressure 76 ± 6.5 mmHg. Patients in e-cigarettes group had systolic blood pressure 14 points higher than in non-e-cigarettes group ($p < 0.001$) and diastolic blood pressure 6 points higher than in non-e-cigarettes group ($p < 0.006$).

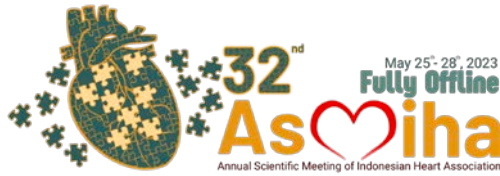
Conclusion: E-Cigarettes group showed an increased on systolic and diastolic blood pressure compared to the non-e-cigarettes group.

Keywords: Electronic Cigarettes, Hypertension, Smoking, Blood Pressure

Table 1. Comparison between e-cigarettes and non-e-cigarettes on systolic and diastolic blood pressure

	E-Cigarettes (N=21)	Non-E-Cigarettes (N=21)	P Value
Systolic Blood Pressure	132 ± 10.8	118 ± 6.7	$p < 0.003$
Diastolic Blood Pressure	82.7 ± 7.0	76 ± 6.5	$p < 0.006$

Table 1. Comparison between e-cigarettes and non-e-cigarettes on systolic and diastolic blood pressure



Are ACE Inhibitors better than ARBs?: A study about comparison between ACE Inhibitor and ARB in CAD Patient

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Background and Aims: ACE inhibitors (ACE-I) and Angiotensin Receptor Blocker (ARB) have been one of the most important treatment of cardiovascular diseases. HOPE and EUROPA trial showed patients with CAD had reduced mortality when received ACE-I compared with placebo. In Korea Acute Myocardial Registry, AMI patients who received ACE-I showed better outcomes than ARB. Recent studies showed that ACE-I more superior compared with ARB in reducing MACE and mortality in patients at high risk for coronary events. However, only few studies discussing effectiveness of ACE-I and ARB at improving Left Ventricular Ejection Fraction (LVEF). This study was conducted to compare the effectiveness of ACEI compared with ARB on LVEF.

Material and Methods: 411 CAD patients age > 18 years old from cardiology inpatient unit in Kandou Hospital from November 2019 to February 2023 were enrolled. Patient with Low EF (<35%), has moderate – severe valve dysfunction, arrhythmia, decrease kidney function (eGFR < 30 ml/min/1.73m²) were excluded. All participants were divided into ACE-I and ARB user group. LVEF was measured using Simpson's biplane method during hospitalization. LVEF comparison between two groups was analysed with independent T-test.

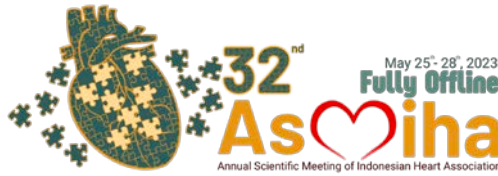
Result: Among 411 CAD patients, 80% was male with the mean age 61 years old, 244 patients (59%) treated with ACE-I and 167 patients (41%) used ARB. In patient treated with ACE-I, mean LVEF 47.09 ± 11.7 % while patient with ARB 51.17 ± 14.64 %. CAD patients in ARBs group had higher LVEF (4.08 points) than ACE-I (p<0.003).

Conclusion: Patients with CAD who received ARB showed higher LVEF compared with patient in ACE-I group.

Keywords: ACE Inhibitor, Angiotensin Receptor Blocker, Coronary Artery Disease, Left Ventricular Ejection Fraction

	ACE-I (N = 244)	ARB (N = 167)	P Value
LVEF (Simpson's BP)	47.09 ± 11.7	51.17 ± 14.64	p<0.003

Table 1. LVEF between ACE-I and ARB groups



Cardiovascular Risk Factors Profile among Younger STEMI Patients Treated with Primary PCI

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Jakarta Heart Centre¹

Background and aims:

Coronary artery disease (CAD) involves various risk factors to emerge. Evidently, an increased proportion of younger patients suffer from ST-elevation myocardial infarct (STEMI) is obvious as observed in multiple epidemiological study. The characteristic of cardiovascular risk factors profile between different group of age might be different. Lack of notable current evidence regarding cardiovascular risk factors hinder our stance to treat patients comprehensively.

Material and Methods :

We performed a cross-sectional study of 97 STEMI patients treated with primary PCI in Jakarta Heart Centre between October 2022 and February 2023. Cardiovascular risk factors and the patient clinical data were obtained from medical records and interview during hospitalization. We divided the subjects into two groups for statistical analysis (≤ 45 years old and > 45 years old).

Results :

We identified 78 men (80.4%) and 19 women (19.6%) diagnosed with STEMI with mean age of 55 ± 10 years. Younger STEMI patients presented with a significantly higher proportion of smoker (80% vs 50%; $p=0.029$). It was also obvious that the proportion of obesity in younger STEMI patients were significantly higher (73.3% vs 43.3%; $p=0.049$). None of any other investigated factors were significantly different between the two age group.

Conclusion :

Younger STEMI patients had significantly different risk factors compared to older patients in terms of obesity and smoking habit.

Keywords :

Younger STEMI Patients, Primary PCI, Risk Factors Profile.

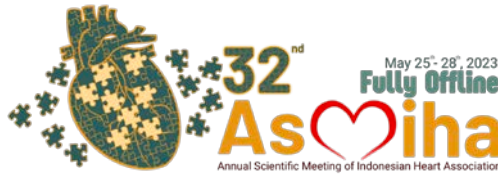
Keywords: Younger STEMI Patients, Primary PCI, Risk Factors Profile

Table 1. Comparison of Risk Factors Profile Between Different Age Population in STEMI Patients

Variables	Age ≤ 45 years old (n=15)	Age > 45 years old (n=82)	p value
Male gender, n(%)	14 (93.3)	64 (78)	0.154
Cardiovascular Risk Factors			
Smoking, n(%)	12 (80)	41 (50)	0.029
Obese, n(%)	11 (73.3)	38 (46.3)	0.049
Diabetes, n(%)	6 (40)	32 (39)	0.943
Family history of CAD, n(%)	4 (26.7)	22 (26.8)	0.631
Lack of exercise, n(%)	12 (80)	55 (67.1)	0.250
Poor diet, n(%)	10 (66.7)	58 (70.7)	0.484
Routine coffee consumption, n(%)	11 (73.3)	54 (65.9)	0.404
LV dysfunction, n(%)	5 (33.3)	24 (29.3)	0.752
PPCI			
Multivessel Disease, n(%)	10 (66.7)	64 (78)	0.341

CAD, Coronary Artery Disease; LV, Left Ventricle; PPCI, Primary Percutaneous Coronary Intervention.

Comparison of Risk Factors Profile Between Different Age Population in STEMI Patients



Atherosclerosis in Women: Menopause as a Risk Factor, Fact or Myth?

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Background and Aim

Women are a specific population with a different atherosclerotic cardiovascular disease (ASCVD) profile. They had a marked increase in coronary heart disease (CHD) risk during midlife, a period concurring with a menopause transition (MT). Few observational studies led to the hypothesis that MT contributes to the increased risk of CHD. This study was designed to evaluate the relationship between menopause and the presence and severity of coronary atherosclerosis in subjects undergoing MSCT coronary angiography for suspected CAD.

Material and Methods

This cross-sectional study includes subjects from the MSCT coronary angiography registry in Dr. Hasan Sadikin General Hospital Bandung from January 2020 until June 2021. A total of 215 patients were enrolled in this cross-sectional study. The non-significant coronary plaque was defined as lesions causing $\leq 50\%$ luminal stenosis and significant plaque was defined as lesions causing $>50\%$ luminal stenosis. All images were interpreted immediately after scanning by an experienced cardiologist.

Results

One hundred forty-six (67.91%) subjects had atherosclerotic plaque and 69 (32.09%) had none. More than half of menopause patients were found to have significant atherosclerotic plaque ($n=57$, 73.1%). Age, diabetes mellitus (DM), BMI, and menopause were significantly associated with significant coronary atherosclerosis. Furthermore, after multivariate adjustment with age, DM, and BMI, menopause is independently increased the risk of significant luminal stenosis by 2.714 times [OR 2.714, (1.361-5.12, p -value <0.05)].

Conclusions

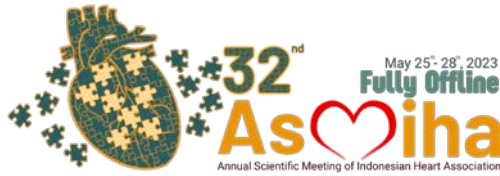
This study demonstrated that menopause plays a crucial role in the atherosclerosis process and is strongly associated with the presence and severity of coronary atherosclerosis detected by MSCT. Therefore, menopause should be considered an important risk factor and always considered in daily practice. Further studies are needed to promote its use in predicting whether menopause patients need more aggressive risk modification and/or treatment regarding coronary artery disease.

Keywords: Coronary Atherosclerosis, Menopause, Computed Tomography, Women

Variable	OR	95% CI	P
Menopause	2.714	1.36-5.41	0.005
Age	1.031	0.98-1.09	0.274
DM	2.349	0.82-6.74	0.538
BMI	1.077	0.99-1.16	0.54

DM: diabetes mellitus, BMI: body mass index

Table 3. A multivariate analysis demonstrating the association between cardiovascular risk factors and the severity of coronary plaque.



EFFECTS OF THE COMPOSITIONS OF THE MEDITERRANEAN DIET ON LIPID PROFILE LEVEL AND RISK FACTORS OF CORONARY HEART DISEASE IN PATIENTS WITH DYSLIPIDEMIA

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Background and aims: Dyslipidemia is a disorder of lipid metabolism as indicated by an increase in total cholesterol, triglycerides, Low-Density Lipoprotein (LDL) accompanied by a decrease in High-Density Lipoprotein (HDL). RISKESDAS 2018 data shows that 15.9% of the population had high LDL levels, 22.9% had low HDL levels, and 11.9% had high triglyceride levels. The Mediterranean diet is one of the non-pharmacological management of medical nutritional therapy for dyslipidemic patients. The aim of this study was to determine the effect of the composition of the Mediterranean diet on lipid profile levels and CHD risk factors in dyslipidemic patients.

Material and Methods: The study design used the observational analytic method and the principle of a prospective cohort in 30 dyslipidemic patients for three months who were examined at the 1st and 3rd month of the study. Data on total consumption used the relative Mediterranean Diet (rMED) through the Food Frequency Questionnaire (FFQ) taken 12 times over 3 months. The ANOVA test and Tukey's post-hoc test were used to examine differences in the composition of the Mediterranean diet and levels of lipid profiles and CHD risk factors across the Mediterranean diet adherence groups. The mean and standard deviation ($M \pm SD$) consumption of each composition of the Mediterranean diet was tested using linear regression analysis to determine the effect of the composition of the Mediterranean diet on lipid profile levels and CHD risk factors.

Results: The results showed that dyslipidemic patients who underwent the Mediterranean diet had an average age of 56.65 years and were 67% female. There is a significant effect between the composition of fruits and nuts, vegetables, whole grains, fish, and olive oil on total cholesterol levels, LDL levels, HDL levels, and triglyceride levels. There is a significant effect between grains and fish on the Framingham risk score.

Conclusion: There is a compositional effect of the Mediterranean diet on lipid profile levels including decreased total cholesterol, triglycerides, and LDL levels also increased HDL levels and decreased risk factors for heart disease coronary artery disease in dyslipidemic patients.

Keywords: Coronary Heart Disease, Dyslipidemia, Lipid Profile, Mediterranean Diet Composition



RISK FACTORS FOR CONGENITAL HEART DISEASE ANOMALIES AT RSUP DR. SARDJITO YOGYAKARTA 2020 – 2021

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BACKGROUND & AIM: Congenital anomaly is one of the causes of increased morbidity and mortality in newborns with the most common type of anomaly is congenital heart disease (CHD). The prevalence of congenital heart disease globally is about 4-5/1000 live births. Asia with the highest rate which is around 9.3/1000 live births. In addition to early detection and treatment or surgery, an assessment of maternal risk factors is needed to prevent CHD in infants. This study aimed to assess maternal risk factors that associated with the incidence of congenital heart disease anomalies.

MATERIAL AND METHODS: This study used a retrospective cohort study design. The data source is medical records of patients who gave birth at Dr. Sardjito Hospital Yogyakarta in 2020-2021. The total sample size was 1311, 37 infants with CHD and 1274 infants without CHD. Data analysis test using Chi-Square or Fisher.

RESULTS: There is a significant association between pregestational DM ($p=0,001$, RR=9,834), history of anomalies in previous pregnancies ($p=0,001$, RR=9,390) and the incidence of CHD. There is no significant relationship between age ($p=0,724$, RR=1,138), parity ($p=0,104$, RR=1,732), obesity ($p=0,298$, RR=1,443) and CHD.

CONCLUSION: Pregestational DM and history of anomalies in previous pregnancies as the risk factors that are significantly associated with the incidence of CHD, while age, parity and obesity are not.

Keywords: Risk factors, congenital anomalies, congenital heart disease, diabetes mellitus, history of anomalies

**THE UTILIZATION OF STATIN THERAPIES IN CORONARY ARTERIAL DISEASE PATIENTS IN
RSUD PROF. DR. WZ JOHANNES GENERAL HOSPITAL KUPANG**

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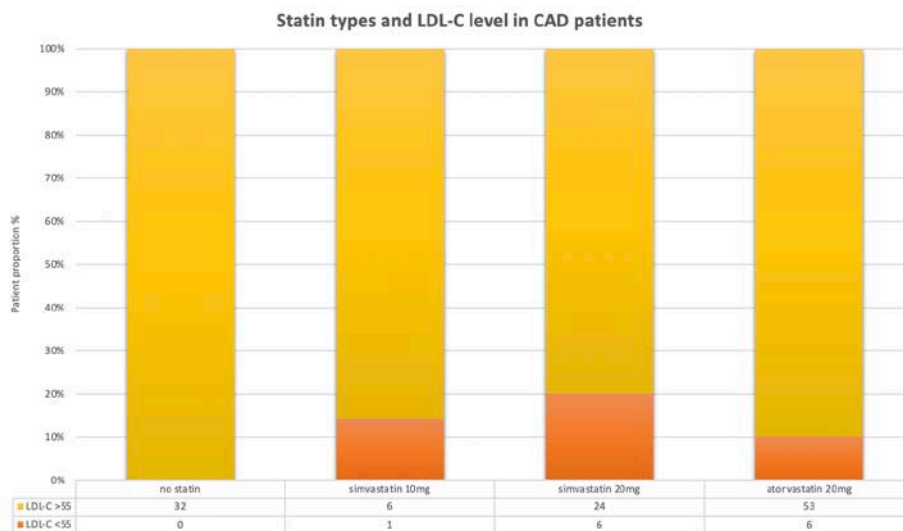
Backgrounds and aims : Guidelines recommend to optimize statin treatment in patients with coronary arterial disease (CAD). Available evidence shows that patients with coronary arterial disease are not receiving sufficient lipid-modifying therapy to mitigate disease-associated risk. The aim of this study was to examine the patterns of statin use among patients with coronary arterial disease.

Materials and methods : This was a cross-sectional study on coronary arterial disease patients in Prof. D.R. WZ Johannes General Hospital Kupang between January 2022 and December 2022. Patients' data from outpatient clinic with diagnosis of CAD were collected by going through their medical records only. Demographic and clinical characteristics, including LDL-C levels and lipid-lowering therapy use, were captured.

Results : A total of 128 patients were included in the analysis. Twenty-five percent (N=32) received no statin treatment, 5% (N=7) received low-intensity statin treatment, 70% (N=89) received moderate-intensity statin treatment, and no patient received high-intensity statin treatment. Recommended LDL-C level <55 was achieved in 14% (N=1) patients with low-intensity statin treatment and in 13% (N=12) patients with moderate-intensity statin treatment. This recommendation wasn't achieved in patients who received no statin treatment. Among patients with moderate-intensity statin treatment who achieved LDL-C level <55, 50% (N=6) were on simvastatin 20mg and the rest were on atorvastatin 20mg.

Conclusions : Nearly 90% patients with coronary arterial disease in this study do not achieve the LDL-C target as recommended by guidelines and those patients are suboptimally dosed with statin therapies.

Keywords: Statin, lipid, LDL-C, CAD



LDL-C, Low-Density Lipoprotein Cholesterol. CAD, Coronary Arterial Disease



The Association between Nutritional Status and Congenital Heart Disease among Children at Umbu Rara Meha General Hospital

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Backgrounds and Aims: Malnutrition and Congenital Heart Disease (CHD) has been shown to have linked among children. According to WHO standards, situation of nutritional problems in Indonesia has exceeded the normal threshold. East Nusa Tenggara is one of the region with the highest prevalence of malnutrition in Indonesia. The aim of this study is to determine the association between nutritional status and CHD at Umbu Rara Meha General Hospital in one year (March 2022-2023).

Materials and Methods: This is a cross-sectional study involving children diagnosed with CHD by a cardiologist using GE Vivid S70 transthoracic echocardiography. Weight, height and age were measured prior to echocardiography. Nutritional status measured using z score for children aged ≤ 60 months and BMI z-score for children aged > 60 months.

Results: There were 85 subjects consisted of 60 children aged ≤ 60 months and 25 children aged > 60 months. There were 46 boys and 39 girls included, with mean of age was 46 ± 57.3 months old. Most of these children were categorized as normal nutrition based on z-score and BMI z-score. Atrial Septal Defect (ASD) and Patent Ductus Arteriosus (PDA) were the majority found among children ≤ 60 months old, while ASD was more common among children > 60 months old. The association between nutritional status and CHD was analyzed using Pearson Chi-square. There was no significant association between nutritional status and CHD among children ≤ 60 months old based on weight/age, height/age, and weight/height ($p=0,782$, $p=0,890$, $p=0,744$, respectively). Also among the children > 60 months old, there was no significant association found between nutritional status based on BMI and CHD ($p=0,054$).

Conclusions: There was no significant relationship between nutritional status and CHD among children at Umbu Rara Meha General Hospital. Other risk factors may need further investigation.

Keywords: Congenital Heart Disease, Nutritional status

Hematological Biomarkers of Troponin, NLR, and MLR Serve as Effective Predictive Indicators of High-Risk Mortality in Acute Coronary Syndrome

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Background and aims: Assessing the potential high-risk of mortality in patients with acute coronary syndrome (ACS), which includes STEMI, NSTEMI, and UAP, is crucial due to the various hematological parameters that can evaluate mortality rates. The aim is to investigate prognostic significance of hematological parameters troponin, CKMB, NLR, PLR, MLR, BLR, and ELR levels in predicting high-risk mortality in ACS patients.

Material and methods: In this retrospective observational study, data from medical records of 115 patients with ACS, including 40 with STEMI, 38 with NSTEMI, and 37 with UAP, were analyzed. Patients were selected using stratified random sampling, whereby five patients were randomly chosen each month from January 2021 to December 2022 while maintaining a 1:1:1 ratio of selection.

Results: Troponin ($r = 0.519$) and NLR ($r = 0.484$) showed moderate positive correlations with high-risk STEMI mortality. Meanwhile, troponin ($r = 0.387$), NLR ($r = 0.279$), PLR ($r = 0.276$), MLR ($r = 0.250$), BLR ($r = 0.237$), and ELR ($r = -0.344$) were found to be significantly correlated with high-risk ACS mortality. Troponin, CKMB, NLR, and MLR were significant ($AUC > 0.7$) for high-risk STEMI mortality, and Troponin, NLR, and MLR were sufficient for high-risk ACS mortality. The results of the multivariate regression analysis indicated that only Troponin (OR: 2.049; 95%CI: 1.802 – 8.218; $p = 0.014$), NLR (OR: 1.652; 95%CI: 1.306 – 7.753; $p = 0.030$), and MLR (OR: 4.067; 95%CI: 1.182 – 13.987; $p = 0.026$) were capable of predicting high-risk ACS mortality. Subgroup analysis showed an increased risk of ACS mortality by GRACE score > 140 in patients with elevated levels of Troponin (OR: 2.787; 95%CI: 1.032 – 7.524; $p < 0.05$), NLR (OR: 3.287; 95%CI: 1.340 – 8.059; $p < 0.05$), and MLR (OR: 4.156; 95%CI: 1.634 – 10.569; $p < 0.05$) above the cut-off value.

Conclusion: Troponin, NLR, and MLR levels above the cutoff independently predict high-risk mortality in ACS.

Keywords: acute coronary syndrome, monocyte to lymphocyte ratio, mortality, neutrophil to lymphocyte ratio, troponin

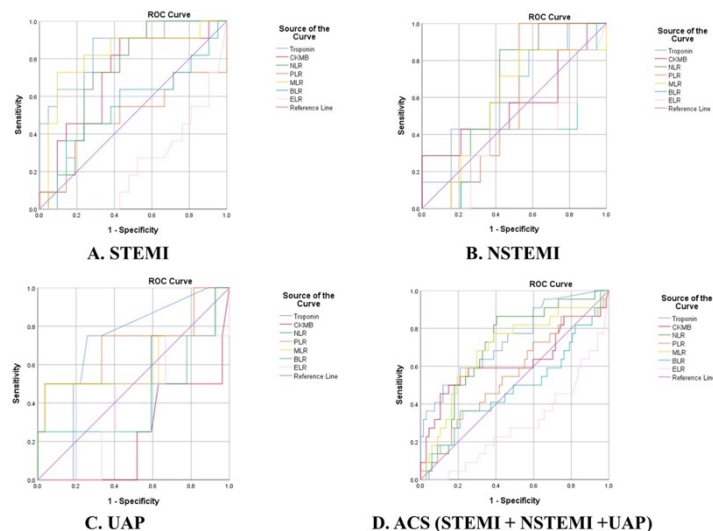
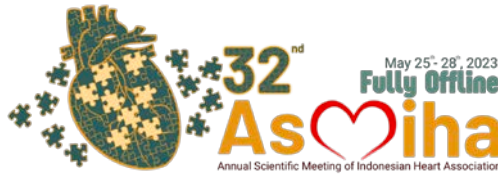


Figure 1. Receiver Operating Characteristic (ROC) analysis of blood parameters, including Troponin, CKMB, NLR, PLR, BLR, MLR, and ELR



HEART RATE INDEPENDENCE OF PREMATURE VENTRICULAR COMPLEX IMPAIRS MYOCARDIAL SYSTOLIC INTRINSIC FUNCTION

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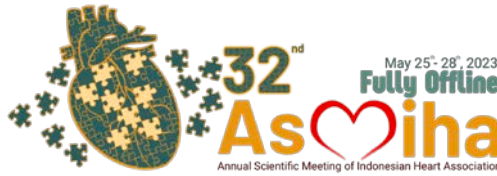
Background & Aims: Premature ventricular complexes (PVC) was associated with a risk of decreased ventricular function and heart failure, and increased long-term mortality. Low circadian variation is one of the predictors of PVC-induced cardiomyopathy. Independent-type-PVC (I-PVC) is a form of PVC with a low distribution of circadian variation. However, not all I-PVC show low circadian variation. No studies have been performed to examine differences in intrinsic systolic function of left ventricle (LV) using global longitudinal strain (GLS) in independent versus heart rate-dependent idiopathic PVC. The aim of this study is to determine the relationship between I-PVC and intrinsic systolic function of LV using speckle tracking echocardiography in patients without structural heart disease.

Materials & Methods: A cross-sectional study was conducted using data from patients with idiopathic ventricular arrhythmias collected at RSPJD Harapan Kita Jakarta in February 2021-May 2021. Evaluation of idiopathic PVC was carried out using a 12-lead ECG, 24-hour Holter monitoring. Basic echocardiography was performed then LV intrinsic systolic function was assessed using speckle tracking echocardiography with global longitudinal study (GLS).

Results: Of the 67 patients with idiopathic PVC included in the study, 27 (40.2%) patients included in the independent PVC group and 40 (59.8%) patients in the HR-dependent PVC group. A total of 31 (46.3%) patients had LV systolic dysfunction on GLS examination (less than -18). Independent-type-PVC (OR 5.3; 95% CI 1.10-33.29; $p = 0.038$), PVC burden of 9% (OR 16; 95% CI 1.58-163.61; $p = 0.019$), male gender (OR 6.58; 95% CI 0.80-0.99; $p = 0.029$), and non-sustained VT episodes (OR 13.88; 95% CI 1.77-108.53; $p = 0.012$) was significantly associated with a decrease in LV intrinsic systolic function.

Conclusion: Independent-type-PVC was associated with decreased LV intrinsic systolic function assessed by speckle tracking echocardiography. Evaluation of the type of idiopathic PVC needs to be considered since it is related with the patient's prognosis in clinical practice.

Keywords: Arrhythmia, cardiomyopathy, circadian rhythm, PVC, speckle tracking



The contrast dilemma in chronic kidney disease patients – is there a safe cut-off?

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Background and Aim:

Cardiovascular disease is the leading cause of death in CKD and has been associated with an increased risk of procedural complications such as renal injury due to contrast from angiography procedures. Some studies have suggested a maximum allowable contrast dose of 30 mL as a risk prevention strategy. This study aims to evaluate whether the 30 mL cut-off for contrast volume can predict lower risk of contrast-induced nephropathy (CIN).

Material and Methods:

This cohort retrospective study consisted of CKD patients that underwent angiography and PCI from 2018 - 2023, then grouped according to contrast use of ≤ 30 ml and > 30 ml. Subgroup analysis was done between patients with and without diabetes mellitus (DM). Patients on hemodialysis were excluded. The primary outcome was contrast-induced nephropathy; defined as creatinine changes of ≥ 0.5 mg/dL from baseline, taken in a minimum of 2 days up to one month post-procedure.

Results:

A total of 53 CKD patients that underwent angiography procedures were obtained. Analysis showed no significant relationship and no lowered risk between contrast volume towards significant increments in creatinine levels ($p=0.624$, OR=0.96). Non-significant relationships were also found in both DM ($p=0.477$) and non-DM ($p=0.532$) subgroup analysis. CKD patients with DM were more likely to experience CIN than the non-DM group. Results are shown in Table 1. This study has some limitations. Small sample size and several confounders such as gender and ejection fraction may have limited our findings.

Conclusion:

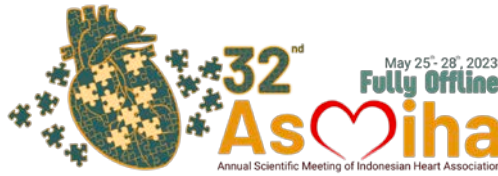
In this study, the 30 ml contrast volume cut-off cannot predict a lower risk of CIN in CKD patients. Study limitations might contribute to the findings. Although so, low-contrast technique should still be considered to minimise risk, especially in the presence of DM. Other strategies such as pre-hydration and intravascular imaging can also be considered.

Keywords: CKD, CIN, contrast, angiography, PCI

Table 1. Results of analyses.

Contrast volume	Rise in creatinine levels				Total		OR (95% CI)	p-value
	<0.5		≥ 0.5		n	%		
	n	%	n	%				
≤ 30 mL	23	79.3	6	20.6	29	100	0.96 (0.22-4.06)	0.624
> 30 mL	19	79.1	5	20.8	24	100		
DM subgroup								
≤ 30 mL	10	76.9	3	23.1	13	100	1.67 (0.25-11.07)	0.477
> 30 mL	6	66.7	3	33.3	9	100		
Non-DM subgroup								
≤ 30 mL	13	81.3	3	18.8	16	100	0.67 (0.95-4.67)	0.532
> 30 mL	13	86.7	2	13.3	15	100		

Table 1 Results of analyses



ASSOCIATION OF LEFT ATRIAL STRAIN WITH ATRIAL FIBRILLATION IN ACUTE ISCHEMIC STROKE PATIENTS

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Background and Aim

Acute ischemic stroke due to cardio-embolism associated with atrial fibrillation (AF) has been known to have the highest risk of recurrence and increased patient morbidity and mortality. Functional changes in the left atrium have been associated with an increased incidence of AF. Using speckle tracking echocardiography 2D (STE-2D), left atrial strain measurement can measure left atrial dysfunction associated with AF. This research aims to determine the association between left atrial strain and AF in patients with acute ischemic stroke.

Materials and Methods

This analytical observation study was conducted with a cross-sectional design, using secondary data from medical records at RSUP Dr. Sardjito within January 2020–December 2022 on the population of acute ischemic stroke patients who underwent an electrocardiogram and transthoracic echocardiography examination.

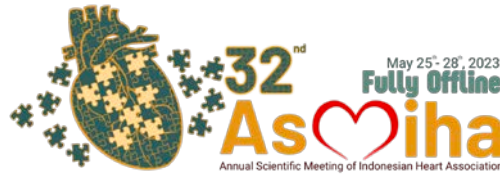
Results

A total of 72 patients diagnosed with acute ischemic stroke met the inclusion criteria as study subjects, there were 49 subjects (68%) with sinus rhythm and 23 subjects (32%) with AF rhythm. The left atrial strain value was found to be lower in the AF rhythm group ($13,02 \pm 8,49$) than in the sinus rhythm group ($25,12 \pm 8,36$) and was statistically significant ($p < 0,001$). Determination of the optimal cut-off value using the Youden Index obtained a left atrial strain value $< 16,25\%$ with a sensitivity of 85,7%, specificity of 73,9%, and area under the curve (AUC) value of 84% ($p < 0,001$, 95% CI 0,74 – 0,95). The value of the prevalence ratio (PR) was 5.67 ($p < 0,001$, 95% CI 2.57 – 12.5), which means that subjects with a left atrial strain $< 16.25\%$ had a prevalence of AF rhythm 5.67 times higher.

Conclusion

Decreased left atrial strain is associated with atrial fibrillation rhythms in acute ischemic stroke patients. Acute ischemic stroke patients with a left atrial strain value $< 16.25\%$ have a higher prevalence of atrial fibrillation rhythm.

Keywords: left atrial strain, atrial fibrillation, ischemic stroke, speckle tracking echocardiography



CORRELATION BETWEEN PULMONARY ARTERY ACCELERATION TIME AND LEFT ATRIAL PRESSURE IN PATIENTS WITH HEART FAILURE WITH REDUCED EJECTION FRACTION

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Background and aims: Echocardiography plays an important role as a non-invasive diagnostic tool in determining left atrial pressure (LAP), especially in patients with heart failure with reduced ejection fraction (HFrEF). Most of the echocardiography parameters that are currently used to determine elevated LAP are highly feasible and moderately reproducible, except the maximal velocity of the tricuspid regurgitation (TR Vmax). Pulmonary artery acceleration time (PAAT) is routinely available and strongly correlates with TR Vmax. This study is intended to determine the correlation between PAAT and LAP.

Materials and method: A cross-sectional study was conducted, enrolling 159 subjects with HFrEF who underwent transthoracic echocardiography (TTE). Echocardiography parameters were collected, such as mitral E/A ratio, mitral E/e' ratio, left atrial volume index (LAVi), and TR Vmax. Subjects were divided into two groups according to LAP based on the 2016 American Society of Echocardiography guidelines for the evaluation of left ventricular diastolic function. PAAT was then categorized into normal and short with a cut-off < 105 ms.

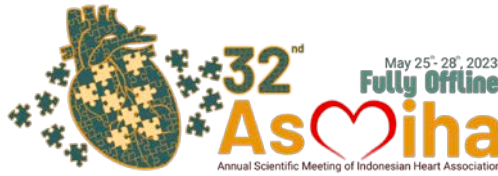
Results: From 159 subjects, 74 patients had a normal LAP with a mean PAAT value of 109.2 ms (± 35.0) and 85 patients had an elevated LAP with a mean PAAT value of 96.3 ms (± 32.6). There was a significant correlation between PAAT and LAP (p value = 0.005). All other parameters, including mitral E/A ratio, mitral E/e' ratio, LAVi, and TR Vmax, also showed significant correlation with LAP. However, TR Vmax was only encountered in 32.1% of subjects.

Conclusion: The measurement of PAAT was highly feasible and had a significant correlation with LAP in patients with HFrEF. PAAT should be considered as an alternative echocardiography parameter in determining LAP in the absence of TR Vmax.

Keywords: PAAT, left atrial pressure, HFrEF

		Left atrial pressure				P value
		Elevated		Normal		
		n	%	n	%	
PAAT	Short	39	24.5	25	15.8	0.005
	Normal	35	22.0	60	37.7	
Total		74	46.5	85	53.5	

Table 1. Correlation between pulmonary artery acceleration time and left atrial pressure in patients with HFrEF



Prevalence of Hypertension and Dyslipidemia in Medical Check Up Community Leaders in DKI Jakarta: Case Study at Matraman Hospital in 2022

V. Gustika¹
RSUD Matraman¹

ABSTRACT

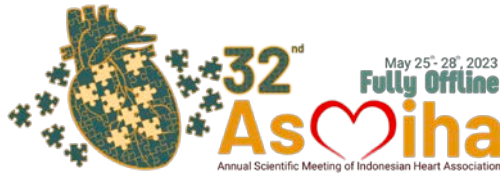
Background and aims : In 2022, DKI Jakarta Government formed a health examination program for community leaders in DKI Jakarta. This is in accordance with DKI Jakarta Governor Regulation Number 46 of 2022 concerning Implementation of Health Insurance. Medical Check Up is carried out to check the overall health of the body in order to anticipate the risk of disease, especially non-communicable diseases such as hypertension and dyslipidemia. Hypertension be diagnosed when a person's systolic blood pressure in the office or clinic is ≥ 140 mm Hg and/or their diastolic blood pressure is ≥ 90 mm Hg following repeated examination. Dyslipidemia is the imbalance of lipids such as cholesterol, low-density lipoprotein cholesterol, triglycerides, and high-density lipoprotein. The purpose of this study was to determine the prevalence of hypertension and dyslipidemia in medical check-up of community leaders in DKI Jakarta, especially those carried out at Matraman Hospital in 2022.

Materials and Methodes: The research method used is observational analytic with a cross-sectional research design. The population in this study were Community Leader Medical Check Up patients at Matraman Hospital in January - December 2022 who underwent physical examinations, EKG, and blood examination which consisted of complete blood tests, and lipid profiles. The number of samples used was 69 patients with the total sampling technique.

Result: From this study it was found that the majority of community leaders medical check-up participants were women (71.1%), the most age was 55-59 years old (15.94%). The prevalence of hypertension was 68.11% (47 patients) and the prevalence of dyslipidemia was 59.42% (41 patients).

Conclusion: This study showed significant results on the prevalence of hypertension and dyslipidemia in community leaders medical check-up. Therefore, the medical check-up program for community leaders can be useful for preventing non-communicable diseases, especially hypertension and dyslipidemia.

Keywords: Key Word: hypertension, dyslipidemia, community leaders



Factors Associated with the Occurrence of In-Hospital Anxiety and Depression Based on Hospital Anxiety and Depression Score (HADS) in Patient with Acute Myocardial Infarction in Sanglah Hospital Denpasar

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Background and aim: Patients with acute myocardial infarction (AMI) often experience anxiety and depression compared with a normative population. The prevalence of depression and anxiety has been extensively investigated, but only a few studies have examined the factors associated with anxiety and depression in patients with AMI. To examine the contributing factor associated with predictors of in-hospital anxiety and/or depression in patients with AMI.

Materials and Methods: This was a single-center, observational cross-sectional study of patients with AMI admitted to Prof. I.G.N.G. Ngoerah Hospital Denpasar in November-December 2020. Data collection from interviews and medical records. The patients were asked to answer the Hospital Anxiety and Depression Scale (HADS) questionnaires.

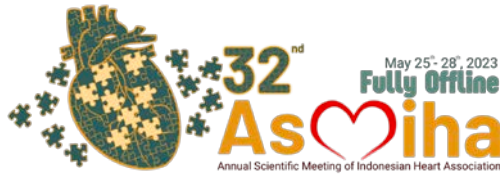
Results: We enrolled 68 patients with AMI (n=68, 7.4% women, mean age 55.2 years), STEMI and NSTEMI proportion was 58.8% and 41.2% respectively. The prevalence of in-hospital anxiety and depression is 25% and 23.5% respectively. On bivariate analysis, we found that female subjects and hypertension were associated with the prevalence of in-hospital anxiety (P-value 0.012 and PR 0.215, P-value 0.012, CI 0.062-0.753 respectively). There is no variable associated with the prevalence of depression.

Conclusion: Female subjects is significantly associated with in-hospital anxiety while hypertension is negatively associated factors to in-hospital anxiety patients with AMI.

Keywords: anxiety, depression, acute myocardial infarction, HADS

	Prevalence Ratio	CI 95%		p-value
		Lower limit	Upper limit	
Age \geq 55 y.o	0.448	0.114	1.397	0.262
EF <50%	0.714	0.231	2.206	0.571
STEMI	0.528	0.174	1.599	0.272
Revascularization	0.485	0.096	2.448	0.429
Female	15.385	1.582	149.612	0.012*
Hypertension	0.215	0.062	0.753	0.023*
Type 2 DM	2.889	0.913	9.136	0.112
Lung disease	1.354	0.397	4.622	0.748
Kidney disease	0.320	0.065	1.575	0.203
Liver disease	1.773	0.541	5.807	0.357

Lower extremities bilateral post thrombotic syndrome



Correlation between Left Ventricular Ejection Fraction and Incidence of Contrast Induced Nephropathy in patients ST Elevation Myocardial Infarct post Primary Percutaneous Coronary Intervention.

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Background and aims : Contrast Induced Nephropathy (CIN) after Primary Percutaneous Coronary Intervention (PPCI) is a serious complication in patient with ST Elevation Myocardial Infarct (STEMI), that associated with increased mortality and morbidity. Early identification of patients with high risk of CIN is necessary for optimizing preventive measure to reduce CIN incidence and improve outcome. The aim of this study is to determine the frequency of CIN after PPCI and its association with LVEF in patient STEMI post PPCI.

Material and Methods : 220 patients age >17 years old who presented with STEMI and underwent first PPCI at Prof R. D. Kandou Hospital, Manado from January 2019 to December 2021 were enrolled. All patients were examined for serum creatinine level at the first contact admitted to hospital (before PPCI) and 24 – 72 hours after PPCI procedure. Patients with 25% increase or > 0.5 mg/dL creatinine rise in post PPCI were categorized for CIN. LVEF was determined using Simpson’s Biplane Method on echocardiography and all data was analyzed with Mann Whitney Test in SPSS.

Results : Among 190 males (86%) patients admitted with STEMI, 66 patients experience CIN post PPCI (30%). Mean LVEF patients who got CIN was 41 ± 9.1 % and in patients without CIN was 46 ± 7.5 % ($p < 0.05$). Patients with LVEF <39.5% show greater risk to develop CIN after PPCI (AUC 0.657, 37.9% sensitivity and 86.4% specificity).

Conclusion : Incidence of CIN after PPCI was associated with LVEF. Patient undergoing PPCI and experienced CIN has LVEF 5.1% lower than those who didn’t. STEMI Patients with LVEF \leq 39.5 % has an increase risk for developing CIN post PPCI procedure, therefore preventive strategies are needed to those kind of patients.

Keywords: Left Ventricular Ejection Fraction, Contrast Induced Nephropathy, Myocardial Infarct, Primary Percutaneous Coronary Intervention

	CIN (N: 66)	No CIN (N: 154)	P value
Mean LVEF	41.30 ± 9.11	46.43 ± 7.51	0.04

Table 1. LVEF value on STEMI Patient underwent PPCI who experience CIN and No experience CIN group



Coffee Consumption among STEMI patients treated with Primary PCI

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Background and aims

Remarkable coffee consumption in daily routine has significantly increased among all parts of general population. Thus far, the association of coffee drinking and myocardial infarction continues to be controversial. Moreover, current evidence of coffee consumption and their contribution in ST-elevation myocardial infarct (STEMI) cases are not yet explored. Hence, we studied the association of coffee consumption and other cardiovascular risk factors in STEMI patients treated with primary percutaneous coronary intervention (PPCI).

Material and methods

We performed a cross-sectional analysis of 97 STEMI patients treated with PPCI in Jakarta Heart Center. This data was collected between October 2022 to February 2023. All patients were interviewed during hospitalization about their daily routine of coffee consumption. Other cardiovascular risk factors and clinical profile were also included in allaying the overall conclusions.

Results

This study involved 78 men (80.4%) and 19 women (19.6%) diagnosed with STEMI with mean age of 55 ± 10 years. Among them, 65 patients (67%) were frequently drinking coffee in daily basis. Prevalence major coffee drinker was found in male (92.3%). Significant association was identified in smoking and diabetes with regularly coffee consumption ($p= 0.04$ and $p= 0.016$). It appeared no contribution of coffee taking with clinical outcome and severity of the disease as observed from similar proportion of Left Ventricle (LV) dysfunction and vessels involved from both groups. None of any other investigated factors were significantly different.

Conclusion

Daily routine of coffee consumption are associated with smoking and diabetes as a cardiovascular risk factors among STEMI patients.

Keywords: Coffee consumption, ST-Elevation Myocardial Infarct (STEMI), Primary Percutaneous Coronary Intervention (PPCI)

Variables	Routine daily coffee consumption (n=65)	No daily coffee consumption (n=32)	p value
Male gender, n(%)	60 (92.3)	18 (56.2)	< 0.000
Age (years)	54.3 \pm 10.1	56.8 (11.3)	0.400
Cardiovascular Risk Factors			
Smoking, n(%)	40 (61.5)	13 (40.6)	0.042
Obese, n(%)	30 (46.2)	19 (59.4)	0.221
Diabetes, n(%)	20 (30.8)	18 (56.2)	0.016
Family history of CAD, n(%)	18 (27.7)	8 (25)	0.778
Lack of exercise, n(%)	45 (69.2)	22 (68.8)	0.962
Poor diet, n(%)	43 (66.2)	25 (78.1)	0.226
LV dysfunction, n(%)	23 (35.4)	6 (18.8)	0.092
PPCI			
Multivessel Disease, n(%)	48 (73.8)	26 (81.2)	0.420

CAD, Coronary Artery Disease; LV, Left Ventricle; PPCI, Primary Percutaneous Coronary Intervention.

Figure 1. Association of coffee consumption with clinical profile and other CAD risk factors in STEMI patients treated with PPCI.

Producing Synthetic Modified mRNA of Soluble ACE2 as a Novel Treatment Against Endothelial Dysfunction

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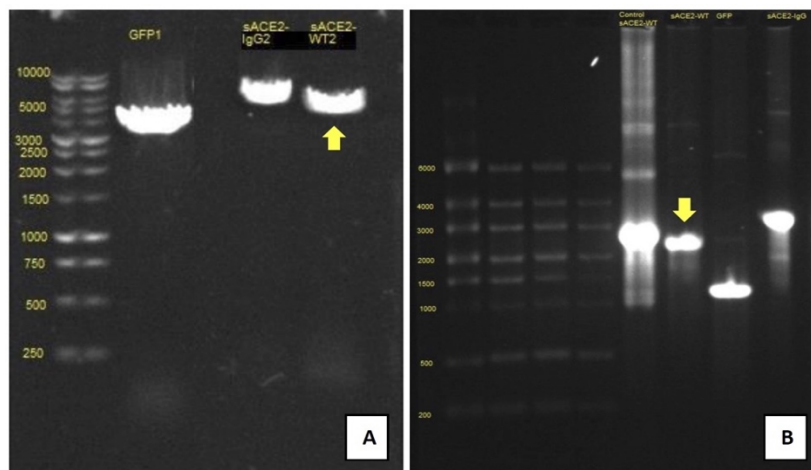
Background and aims: The COVID-19 outbreak has provided a large scale of evidence that messenger ribonucleic acid (mRNA)-based vaccine is effective and safe, laying the groundwork for advancement of RNA-based therapy for other clinical conditions. mRNA can now be cost-effectively synthesized by in vitro transcription technique but is prone to degradation by RNases and immune responses. Chemical modifications can enhance mRNA stability and reduce immunogenicity. Angiotensin-II overexpression can disturb vascular hemostasis leading to endothelial dysfunction. Angiotensin-converting enzyme 2 (ACE2) can decrease the number of angiotensin-II by converting them into a vasculoprotective enzyme, angiotensin-(1-7). Here we produced synthetic modified mRNA of soluble ACE2 that will be used for endothelial dysfunction treatment.

Materials and Methods: Soluble ACE2 plasmid DNA (pDNA) templates underwent a linearization using restriction enzyme and were run into gel electrophoresis to validate the result. Linear pDNA was then subjected to in vitro transcription using T7 RNA Polymerase with predefined mix of natural ribonucleotide, chemically modified ribonucleotide N1-Methylpseudouridine-5'-Triphosphate (pUTP), and 3-O-Me-m7G(5')ppp(5')G anti-reverse cap analog (ARCA). Unmodified ACE2 mRNA was also synthesized as a control. At last, synthesized modified mRNA was purified. Purity and quality were verified using a NanoDrop spectrophotometer and gel electrophoresis.

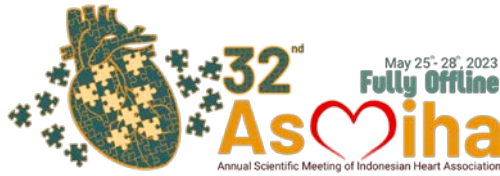
Results: Soluble ACE2 pDNA linearization was succeeded, indicated by a single DNA band of approximately 6000 bases on the agarose gel. In vitro transcription resulted in 382.92 ng/μl of soluble ACE2 mRNA. Chemically modification generated more stable mRNA implied by a single, sharp, and descent band of approximately 2500 bases compared to control that showed smeared band on the agarose gel.

Conclusion: We generated a stable soluble ACE2 modified mRNA. This modified mRNA possibly has low immunogenicity and has the potential to be used as a therapeutic agent for endothelial dysfunction in various forms, such as parenteral drugs or an additional compound in drug-eluting stents.

Keywords: Modified mRNA, ACE2, Endothelial dysfunction, mRNA-based therapy



(A) Agarose gel electrophoresis validated the result of pDNA linearization (B) Agarose gel electrophoresis confirmed that synthesized modified mRNA was stable.



ARRHYTHMIA IN ACUTE INFERIOR MYOCARDIAL INFARCTION: WHAT, WHERE AND HOW LONG? OBSERVATIONAL DATA FROM RSSA

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Rumah Sakit Saiful Anwar, Malang¹

Background and Aim: Arrhythmia can be found in acute inferior Myocardial Infarction (MI). Right Coronary Artery (RCA) vascularizes the area of the sinus and AV nodes, and carries vagal afferent fibers that play role in arrhythmias. Occlusion at proximal RCA often causes AV arrhythmia in Inferior AMI patients. The occurrence of arrhythmias immediately after an AMI attack tends to have a good prognostic returning to the original rhythm.

Materials and Methods: Our observational data from catheterization registration 2022 – FEBRUARY 2023 at RSSA was found 9 patients with arrhythmia conditions in acute Inferior MI.

Result: The most common feature of arrhythmia was TAVB (6/9 cases ~ 67%). There were 8/9 case inferior MI with acute total occlusion at RCA. Of the 8 cases, 50% occurred in the proximal RCA position, 40% occurred in the mid RCA position, and only 10% occurred in the distal RCA. After revascularization, 9 cases was changed to sinus rhythm or first degree av block mostly during 1 day post treatment (56%) with the longest span of 6 days post treatment (11%).

Conclusion: The most common type of arrhythmia found in acute inferior MI was the TAVB rhythm, with the most location of the lesion in proximal RCA. It is related to RCA as vascularization in the AV node. The length of time from TAVB to sinus rhythm or first degree av block was occurred between 1 day to 6 days post-treatment. Early revascularization showed the beneficial effect in the AV node area and the vagal effect after acute inferior MI.

Keywords: Acute Inferior Myocardial Infarction, Total AV Block, Acute Total Occlusion Right Coronary Artery

Effect of Six Weeks Exercise Program on Ventilatory Efficiency in Patients with Pulmonary Arterial Hypertension

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Background and Aims

Supervised exercise programs are known to be safe and essential for patients with pulmonary arterial hypertension (PAH), however, exercise prescriptions for patients with PAH are still imprecise. This study aimed to investigate the effect of a 6-week aerobic exercise program on the ventilatory threshold and ventilatory efficiency in pulmonary arterial hypertension patients.

Material and Methods

The exercise program included ten patients with diagnosed pulmonary arterial hypertension examined by right heart catheterization. We performed cardiopulmonary exercise tests at the baseline and the end of the study. Ventilatory variables were examined at the ventilatory threshold (VT), determined via the equivalent method. Patients were then assigned to a 6-week exercise program with 20 sessions of walking exercise with a duration of 25-30 minutes at the intensity near the ventilatory threshold heart rate.

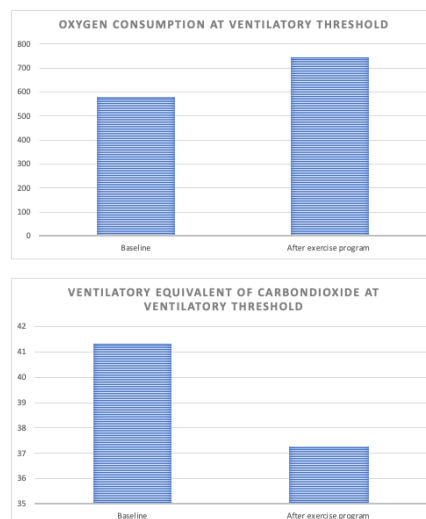
Result

In this study, the mean age was 26 ± 10 years, body weight 47 ± 12 kg, BMI $18,57 \pm 4$, and prevalence in men as high as 50% (5). Significant improvements occurred for oxygen uptake at VT 578.5 ± 301 to 744.20 ± 229 ml/min, $p=0.018$, and ventilatory equivalent of carbon dioxide (VE/VCO₂) at VT 41.31 ± 5.5 to 37.28 ± 4.76 , $p=0.019$.

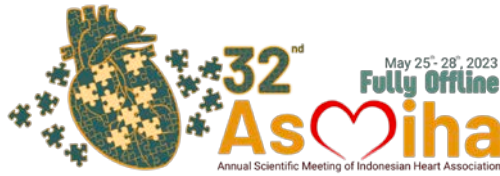
Conclusion

The findings of this study show that 6 weeks of low to moderate intensity walking exercise improves ventilatory efficiency in pulmonary arterial hypertension.

Keywords: Rehabilitation, PAH, Ventilatory, Threshold, CPET



Improved ventilation efficiency was demonstrated by increased oxygen consumption and decreased VE/VCO₂ after the exercise program related to baseline.



Comparison of Clinical Outcome and Transthoracic Echocardiography Examination in Mitral Stenosis Patients Who Received Surgical Mitral Valve Replacement at Dr. Sardjito Hospital, Yogyakarta

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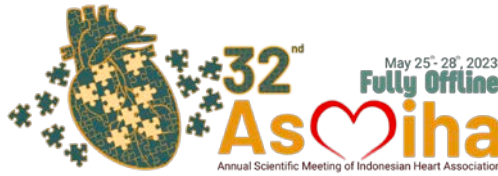
Background and Aim: In certain cases, patients with mitral stenosis (MS) require mitral valve replacement (MVR). Patients with mitral valve replacement (MVR) have a fairly favorable prognosis. This study examined a comparison of clinical outcomes and echocardiographic findings in MS patients undergoing MVR.

Material and Methods: A retrospective cohort of 58 patients with MS underwent MVR surgery at Dr. Sardjito General Hospital, between 1 January 2014 and 31 December 2022 were studied. Patients with the incomplete medical record, comorbidities, and history of previous heart surgery were excluded. Data collected prospectively were retrospectively analysed from the unit cardiac research office VHD registry database. We compared NYHA class, and echocardiographic results (left atrial and left ventricular changes) before and after MVR.

Results: Out of the 58 MS patients who received MVR, only 56 patients could be analyzed, 2 patients died shortly after the MVR procedure. The mean age of the patients was 39.18 years with the predominant female gender (64.3%). MS patients were accompanied by other valve defects (complex 76.8%, double 23.2%) with rheumatic heart disease (RHD) 33.9% and non-RHD 66.1% etiologies. Clinical improvement was observed after surgery with a significant decrease in NYHA class ($p=0.000$) and changes in pre vs post-MVR TTE results in LA and LV (LA 52.69 mm vs 47.69 mm, $p=0.000$; LVEF 56.80% vs 58.35%, $p=0.378$; LVIDd 47.66 mm vs 45.66 mm, $p=0.05$; LVIDs 33.55 mm vs 32.00mm, $p=0.039$ and FS 29.39% vs 30.12%, $p=0.642$).

Conclusion: There were clinical changes in NYHA class and significant improvements in left atrial and left ventricular parameters on transthoracic echocardiography results, specifically LA size, LVIDd and LVIDs in MS patients who had been treated with MVR.

Keywords: Comparison, Class functional NYHA, Echocardiography, Mitral Stenosis, Mitral Valve Replacement.



Perindopril vs Losartan Affect ACE2 and IL-6 Expression in Obese Rat Models

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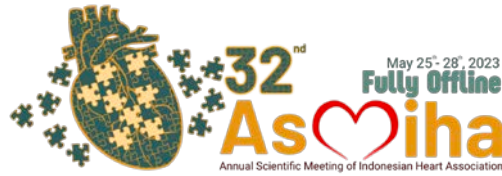
Background and aims: Obesity is strongly correlated with an increased risk of hospitalization especially in COVID-19 patients with severe symptoms. Cells adipocytes play a role in the pathomechanism of SARS-CoV-2 infection through the expression of the angiotensin converting enzyme 2 (ACE2) receptor. In addition, adipocytes also have the ability to trigger the production of pro-inflammatory cytokines, such as Interleukin-6 (IL-6). To prevent severe symptoms in SARS-CoV-2, by focusing on restoring ACE2 expression. the purpose of this study was to determine the exposure of perindopril and losartan to the expression of ACE2 and IL-6 in the Obese Rat Model

Materials and Methods: This study used in vivo true experimental with a post-test only control group design. The samples were 25 adult male albino Wistar rats were divided into four groups (K1: negative control; K2: positive control group with obesity induction; P1: induce obesity with Perindopril (2 mg/kgbw/day); P2: induce losartan (20 mg/kgbw/day). the rats were sacrificed to collect blood and visceral fat tissue. Examination of ACE2 and IL-6 expression used the Enzyme-linked immunosorbent assay (ELISA).

Results: The results showed that obese mice had higher levels of ACE2 (697.25) than baseline (606.91). Perindopril administration to obese rats had ACE2 levels that were not much different (782.33) from the positive control group (P=0.657). However, a significant increase was found in the Losartan group, which losartan group different significantly from the Perindopril group (P=0.011) and the positive control (P=0.004). While in perindopril group had lower IL-6 levels (12.11) than positive controls (P=0.020). But the Losartan group also showed promising results where significantly reduced ACE2 levels (10.65) compared to the positive control group (P=0.002)

Conclusion: Losartan increase ACE2 level higher than Perindopril, while perindopril and losartan can decrease IL-6 expression in obesity. This study can provide insight into the basic mechanism of severe COVID-19 symptoms in obese patients.

Keywords:



How Heart Failure Patient Starting Selfcare: A Phenomenology Study

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Background and Aim: Heart failure is a global public health problem, affecting approximately 64 million people worldwide. The incidence of heart failure continues to increase with age and does not decrease with the advancement of medical technology. Heart failure patients will have to do self-care at home for the rest of their lives. The patient's behavior of self-care is still poor and the patient does not understand well. A good understanding of the implementation of self-care for heart failure patients makes it easier for health workers to prepare patients to do so. This study aimed to explore the experiences of heart failure patients in self-care at home.

Material and Method: A descriptive phenomenology study was conducted on 19 heart failure patients with an average age of 59.2 years who were self-care at home. In-depth interviews were conducted with patients who visited RSUB heart polyclinic to explore patients' experiences of self-care. In-depth interviews are conducted individually for 30-45 minutes. All in-depth interviews were recorded, transcribed, and analyzed using thematic analysis.

Result: The analysis results obtained three main themes: the patient's perspective in carrying out self-care, the efforts of heart failure patients to carry out self-care, and the readiness of heart failure patients to do self-care. The results of this study show that patient acceptance and understanding are the first step to continuing self-care and adapting to heart failure conditions at home.

Conclusion: Heart failure patients are motivated to do self-care if they understand that their condition is a chronic disease and occurs throughout life. The readiness and social support that patients receive is an essential component of carrying out heart failure patients' self-care. Health workers must provide health education and support patients adapting to self-care.

Keywords: selfcare, heart failure, phenomenology



Correlation Between Tiffeneau–Pinelli Index and Mean Pulmonary Arterial Pressure in Atrial Septal Defect Patient

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Background and aims

Tiffeneau-Pinelli index (FEV₁/FVC ratio) is a calculated ratio used in the diagnosis of restrictive lung defects by spirometry. Restrictive lung defect caused by increase of pulmonary arterial pressure are associated with higher mortality in adult patients with congenital heart disease including atrial septal defect including post operative mortality. The objective of this research was to analyse the correlation between Tiffeneau-Pinelli index and mean pulmonary arterial pressure (mPAP).

Material and Methods

This study was a-single centre, retrospective study, included adult patients with atrial septal defect underwent closure surgery between Januari – December 2022. Forced Expiratory Volume in the 1st second (FEV₁) and Forced Vital Capacity (FVC) calculation was performed by using spirometry, several weeks before operation. All procedures were performed according to 2019 ATS/ERS standardization of spirometry. FEV₁/FVC ratio was divided into severe (ratio <50%) and not severe (ratio ≥ 50%). Right heart catheterization (RHC) indices, including mPAP, flow ratio, and Pulmonary Arterial Resistance Index (PARI), were recorded.

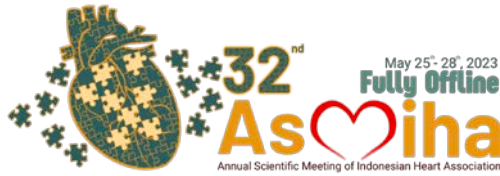
Results

A total of 32 patients (34 ± 14 years, 33% men) were enrolled. Of 32 patients, 18 patients have mPAP <40 mmHg and 14 patients have mPAP ≥40 mmHg. Patient with higher mPAP have significantly lower FEV₁ and FVC, *p* 0.03 and *p* 0.02, respectively. FEV₁/FVC ratio was lower in patient with higher mPAP as well which means that patient with higher mPAP tend to have severe restrictive lung defect. There is statistically strong correlation between Tiffeneau–Pinelli Index and mPAP (*r* 0.489 and *p* 0.002).

Conclusion

Tiffeneau-Pinelli index have strong correlation with mPAP in patient with ASD. Low Tiffeneau-Pinelli index is associated with higher mean pulmonary arterial pressure and vice versa.

Keywords:



Correlation between NT-proBNP and ECG Criteria in ASD Adult Patients with Pulmonary Arterial Hypertension

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Background and aims

Atrial septal defect (ASD) remains the most frequent congenital heart disease resulting pulmonary arterial hypertension (PAH) in Indonesia. Strict management and assessment are required while monitoring PAH treatment. NT-proBNP is a critical biomarker for monitoring. Unfortunately, not all health care institutions are able to do NT pro BNP exams because of its high cost or lack of availability. This is in contrast to the ECG examination, which is widely available with reasonably priced. The purpose of this research is to evaluate the relationship between NT-proBNP levels and ECG parameters in adult ASD-PAH patients.

Materials and Methods

This study included 78 individuals diagnosed with ASD-PAH by right heart catheterization (RHC) and who had NT-proBNP and ECG examinations. NT-proBNP levels > 1400 were classified as extremely high risk, whereas NT-proBNP values < 1400 were classified as low-moderate risk. A total of 21 PAH-ECG parameters that correlate with NT-proBNP were analyzed, and then the cut off value was determined from these parameters.

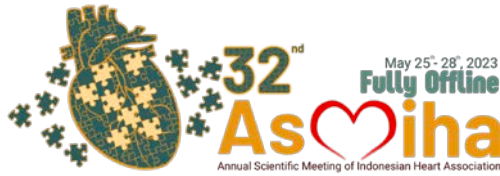
Result

21 ECG characteristics were investigated in 78 ASD patients with PAH, and three parameters were shown to be significantly correlated with NT-proBNP (R in lead I, R in AVR, and Maximal R in V1/V2 + Max S in I/aVL - S in V1). The limit values for each parameter to assess NT-proBNP 1400 are as follows, R in the lead I of 4.35mm, R in aVR of 2.15mm, and Maximal R in V1/V2 + Max S in I/aVL - S in V1 of 19.5mm.

Conclusion

ECG characteristics that correlate with NT-proBNP can aid in determining the risk profile of ASD patients with PAH in settings where NT-proBNP investigations are not available.

Keywords: Atrial Septal Defect, Pulmonary Hypertension, Pulmonary Arterial Hypertension, NT-proBNP, ECG



Predictors of In-Hospital Mortality in Patients with ST Segment Elevation Myocardial Infarction – An Insight from Single Centre Study

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Background and aims

Incidences of ST segment elevation myocardial infarction (STEMI) are rising rapidly and represent a major global health concern due to their high morbidity and mortality rate. This study aimed to identify risk factors for in-hospital mortality due to STEMI at Dr. Kariadi Hospital, Semarang.

Material and Methods

This study is retrospective study that include all STEMI patients with onset less than 12 hours between January 2022 and February 2023. Multivariate analysis was performed using logistic regression with the backward method to assess predictors of mortality.

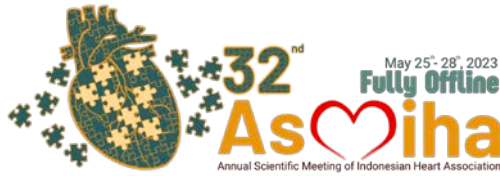
Results

This study involved 162 patients with mortality rate was 17.9%. Multivariate analysis showed that several factors could increase the risk of mortality: diabetic mellitus (DM) (aOR 2.7; 95% CI = 1.8 – 8.3), cardiac arrest on admission (aOR 12.04; 95% CI = 8.6 – 16.9), heart rate (HR) <60 or >100 bpm (aOR 1.7; 95% CI = 1.2 – 6.6 and aOR 1.6; 95% CI = 1.2 – 2.4, respectively), Killip class IV (aOR 3.6; 95% CI = 1.3 – 6.5), creatinine >2.0 mg/dL (aOR 1.8; 95% CI = 1.5 – 6.4), ventilator usage (aOR 4.1; 95% CI = 2.7 – 7.3), and anterior extensive STEMI (aOR 4.8; 95% CI = 1.5 – 7.3). Factors that could reduce the mortality risk: angiotensin blocker (aOR 0.28; 95% CI = 0.07 – 0.61), statin (aOR 0.7; 95% CI = 0.31 – 0.88), mineralocorticoid receptor antagonist (MRA) (aOR 0.35; 95% CI = 0.11 – 0.67, and primary percutaneous coronary intervention (PPCI) (aOR 0.16; 95% CI = 0.03 – 0.55).

Conclusion

Clinical presentation of cardiac arrest has the highest risk of death, the sequence is anterior extensive STEMI, ventilator usage, Killip class IV, DM, creatinine >2.0 mg/dL, and HR <60 bpm or >100 bpm. Administration of angiotensin blocker, statins, MRA, and PPCI are factors that reduce the risk of death.

Keywords:



Prognostic Role of Tricuspid Annular Plane Systolic Excursion to Pulmonary Arterial Systolic Pressure Ratio in Patient with Severe Mitral Regurgitation

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RSUP Dr. Kariadi Semarang / Universitas Diponegoro¹

Background and aims

Right ventricular to pulmonary arterial coupling (RV-PA coupling) has recently been recognized as an important prognostic factor in heart failure including the risk of atrial fibrillation. The ratio of tricuspid annular plane systolic excursion (TAPSE) to echocardiographically pulmonary arterial systolic pressure (PASP) has been used as a proxy of RV-PA coupling. In this study, we aimed to assess the ability of TAPSE/PASP ratio as a non-invasive measure of RV-to-PA coupling in predicting atrial fibrillation in patients with severe mitral regurgitation.

Material and Methods

This is a single centre, retrospective study analysis, encompassing 44 patients with severe mitral regurgitation diagnosed by using transthoracic echocardiography. At the time of admission, an echocardiographic examination of the systolic and diastolic function of the left ventricle was done. In order to evaluate the functions of the RV, the calculations of TAPSE, PASP, and the ratio of TAPSE to PASP were performed. Velasco et al, in 2021, showed that TAPSE/PASP ratio less than 0.35 was associated with poor prognosis. Data were studied to determine the ability of TAPSE/PASP ratio to predict atrial fibrillation in patient with severe mitral regurgitation.

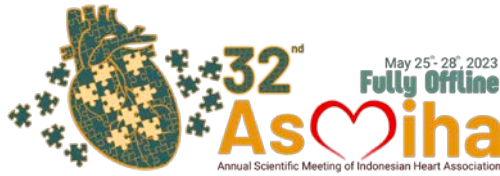
Results

The study included 44 patients with severe mitral regurgitation. Mean age was 51.55 ± 15.46 years and 32 (72.7%) patients were male. TAPSE/PASP ratio probably became better prognostic atrial fibrillation predictor than either TAPSE or PASP separately. TAPSE/PASP ratio ≤ 0.35 was associated with increased risk of atrial fibrillation (83% patient) and statistically had positive correlation with the incidence of atrial fibrillation (r 0.422, with p -value 0.002).

Conclusion

TAPSE/PASP ratio appears as poor prognostic predictor in patients with severe mitral regurgitation. It is associated with the increase risk of atrial fibrillation in such patients.

Keywords:



Predictors of in-Hospital Mortality of ST-Segment Elevation Myocardial Infraction Patients in RSUD Dr. Iskak Tulungagung

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RSUD Dr. Iskak¹

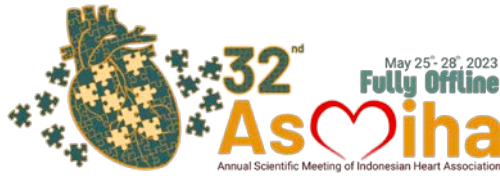
Background and aims: ST-segment elevation myocardial infraction (STEMI) represent as a major cause of morbidity and mortality in worldwide. Multifactorial conditions can cause in-hospital mortality of STEMI patients. The aim of this study was to asses the clinical characteristics and predictors of in-hospital mortality of STEMI patiens in RSUD Dr. Iskak Tulungagung.

Materials and Methods: This was an observational case control study of 368 patients admitted to RSUD Dr. Iskak Tulungagung with STEMI between August 2020 – July 2021. Sample characteristics were associated with the incidence of in-hospital mortality. Data was analyzed by chi-square and logistic regression.

Results: The multivariat predictors of in-hospital mortality of STEMI patient included age (≥ 50 years) (OR=21.2, 95% CI=1.2-34.9, P=0.03), gender, man (75.5%) more than woman (24.4%) (OR=0.5, 95% CI 0.23-0.58, P=0.07), not receive Percutaneous Coronary Intervention (PCI) (32%) (OR=12.8, 95% CI 6.24-26.3, P<0.00), have advanced Killip class (71%) (OR=12.83, 95% CI 6.3-26, P<0.00), 51% have a high glucose level on admission (>200 mg/dl) (OR=3.17, 95% CI 1.6-6, P<0.00), and 60% have a low eGFR (<60 ml/min/1.73m²) (OR=4, 95% CI 2.1-7.7, P<0.00). Patients treatment without Angiotensin-converting enzyme inhibitors/Angiotensin receptor blocker (ACE-i/ARB) (86.7%) and Beta-blockers (BB) (91.1%) have a higher in-hospital mortality, (OR=7.9, 95% CI 3.3-19.4, P<0.00), (OR=7, 95% CI 2.48-20.2, P<0.00) respectively.

Conclusions: Advanced age, gender (male), not receiving PCI, high glucose level on admission, low eGFR, advanced Killip class, patient treatment without ACE-i/ARB or BB were the strongest independent predictor of in-hospital mortality patient with STEMI in RSUD Dr. Iskak Tulungagung.

Keywords: STEMI, in-Hospital mortality



Knowledge Upgrading of General Practitioners in the Community Health Cares in Surabaya After Joining Virtual Training of Early Cardiovascular Detection in Pregnancy: A Quasi-Experimental Study

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Background and Aim: To assess the knowledge improvement of general practitioners of Surabaya community health centers about screening, recognizing, and managing cardiovascular disease in pregnancy after receiving intervention, formed as virtual training

Material and Method: This study is a quasi-experimental study with one-group pretest-posttest design. Intervention, formed as educational virtual training about heart disease detection in pregnancy, was given to the participants. Participants consisted of general practitioners practicing at Community Health Centers in Surabaya. Pre-test and post-test consisted of questions about training's curriculum was given to the participants. Mean scores of the tests compared after the intervention.

Result: There was a statistically significant difference (anova P value < 0.001) in the pretest scores between groups with working experience of 3 years (22.04), 3 to 5 years (32.44), and >5 years (40.44), but had no significant differences in post-tests score increasing. pre-test scores of participants who worked in the MCH section were significantly higher (36.53 ± 9.18) than those who worked in the non-MCH division (32.33 ± 9.65) ($P < 0.05$); however, the rise in post-test scores did not differ significantly between the two groups ($P = 0.875$). (Table 1) There was a significant increase ($p < 0.001$) on the test before and after the intervention, with an average increase of 42.18 points. and were not influenced by any other variables.

Conclusion:

Educational virtual training was proved as an effective method to increase the knowledge of heart disease awareness in pregnancy from this study, from early detection and management, therefor heart disease in pregnant mothers can be diagnosed and treated early, even before pregnancy. It is anticipated that early diagnosis and treatment of heart disease during pregnancy will reduce maternal and infant mortality

Keywords: Community medicine, heart disease in pregnancy, virtual training, general practitioner.

Digoxin Potently Inhibits the Binding of SARS-CoV-2 to ACE2 and Attenuates Cytokine Storms along with Thrombosis Complication of COVID-19

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Background and aims: Obesity increases the risk of cardiovascular issues in COVID-19 due to higher angiotensin-converting enzyme 2 (ACE2) expression in adipocytes. ACE2 binds to SARS-CoV-2 spike protein and triggers production of proinflammatory cytokines and prothrombotic factors such as tissue factor (TF) and plasminogen activator inhibitor-1 (PAI-1). In silico studies showed digoxin strongly inhibits the binding of ACE2 to SARS-CoV-2 spike protein. We investigated the effects of digoxin on the ACE2-spike protein binding, cytokines, and prothrombotic factors levels in adipocytes exposed to SARS-CoV-2 spike protein.

Material and methods: Adipocytes were isolated from visceral adipose tissue obtained from an obese male donor. Adipocytes exposed to SARS-COV-2 S1 spike protein for 24 hours. After spike protein exposure, 0.15 μ M digoxin was added to the culture. 100 μ g human recombinant soluble ACE2 (hrsACE2) was also added in another culture group as a comparison. 48 hours later, a binding assay of ACE2 and spike protein was performed using a kit. We also measured ACE2, IL-6, IL-1 β , TNF- α , TF, and PAI-1 levels using ELISA.

Results: SARS-COV-2 spike protein exposure significantly elevates ACE2, IL-6, TNF- α , TF, and PAI-1 levels. There is no ACE2-spike protein binding detected in culture group with addition of digoxin and hrsACE2. Compared to positive control, digoxin significantly lowered IL-6 (48.94+1.80 vs 90.93+ 4.29, $p < 0.01$) and TNF- α (87.65+ 6.88 vs 307.95+57.34, $p < 0.01$). The digoxin group also had lower TF (5.33+0.32 vs 6.85+0.22, $p < 0.01$) and PAI (2.92+0.168 vs 4.86+0.11, $p < 0.01$). This digoxin's effect was comparable to hrsACE2. ACE2 has a strong positive correlation with IL-6 ($p < 0.05$; $r = 0.763$), and TF ($p < 0.05$; $r = 0.768$).

Conclusion: This study suggests that digoxin reduces proinflammatory cytokines and prothrombotic factors levels via inhibiting SARS-COV-2 spike protein binding to ACE2. This study provides evidence and additional insight into the use of digoxin in COVID-19 or ACE2-associated cardiovascular disease.

Keywords: ACE2, SARS-CoV-2, Tissue factor, PAI-1, Digoxin

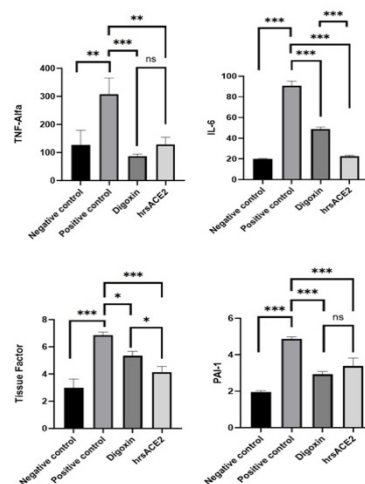
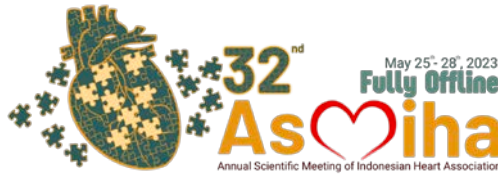


Figure 1. Representative graphs show between-group comparisons on IL-6, TNF- α , TF, and PAI-1 levels. (*) means significant difference, ns=no significant difference.



Characteristic of Low Clinical Likelihood Chronic Coronary Syndrome patients with Significant Coronary Lesion in RSUP dr. Mohammad Hoesin Palembang

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Background and Aims: Chronic coronary syndrome (CCS) is a pathological process characterized by atherosclerotic plaque accumulation in the epicardial arteries, whether obstructive or non-obstructive. Significant Coronary artery disease (CAD) is defined by invasive coronary angiography as >50% stenosis of the left main stem, >70% stenosis in a major coronary vessel, or 30% to 70% stenosis with fractional flow reserve ≤ 0.8 . This study aimed to identify the characteristics of low clinical likelihood CCS patients with significant coronary lesion based on pre-test probability (PTP) score, demographic characteristics, risk factors, laboratory and echocardiography findings.

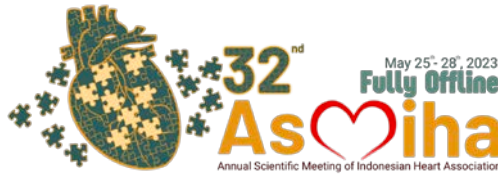
Materials and Methods: This is a retrospective cohort study. We reviewed 60 medical records of low clinical likelihood chronic coronary syndrome patients with positive inducible ischemia area from dobutamine stress echocardiography and significant CAD lesion from coronary angiography.

Result: The incidence of significant CAD in this population was 56.1%. There was a significant relationship between age > 65 years with the incidence of significant LAD lesion (23.3%, $p = 0.017$); significant LCx lesion (20%, $p = 0.040$). There was a significant relationship between PTP score $\geq 16\%$ with significant LAD lesion (55.0%, $p = 0.001$); significant LCx lesion (45.0%, $p = 0.020$); and significant RCA lesion (40.0%, $p = 0.023$).

Conclusion: Patients with age > 65 years have a higher incidence of significant LAD and LCx lesions. Patients with pre-test probability score $\geq 16\%$ have a higher incidence of significant lesions across coronary branches, predominantly in the LAD.

Keyword: chronic coronary syndrome, significant coronary artery disease, dobutamine stress echocardiography.

Keywords: chronic coronary syndrome, significant coronary artery disease, dobutamine stress echocardiography.



ST-T SEGMENT ABNORMALITY IN THE ECG OF COAL MINING WORKERS AT PT. X AND FRAMINGHAM SCORE: A RETROSPECTIVE COHORT STUDY

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Background and Aims

Mining activities related with heart-lung disease. The incident of lung disease on mine coal worker easy to identified, meanwhile the research of heart disease was still limited. Studies prove that ultrafine particles in the environment of mining coal relate with CAD (*Cardiovascular Atherosclerotic Disease*). It could become a risk factor of cardiovascular disease on mine coal worker. Early detection of cardiovascular disease on worker done through EKG examinations routine, and determinant feature on leading ST-T segment toward infarction. This study aims to analytical between abnormality ST-T segment on the ECG with work environment and medical factors on mine coal worker in Indonesia.

Materials and Methods

This study use design cohort retrospective with multivariate method analysis in a whole man worker at PT. X did routine medical examination for 4 years (2018-2021). Abnormality ECG due to ST-T segment identified by *Minnesota code* on the ECG. Abnormal ST-T segment later compared with job factors (type worker and year) and medical factor (*Framingham Score*). This study use.

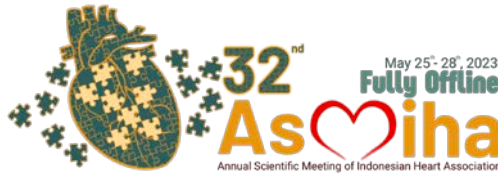
Results

There are 755 workers mine coal man have a normal ECG results in 2018, meanwhile about 158 (20.9%) workers have an abnormal ECG on in 2021 and only about 37 (4.9%) workers who have feature on ST-T segment. This study show that job factor considered as determinant, however the medical factor (*Framingham Score*) is considered the most significant to feature ST-T segment (p multivariate < 0.002).

Conclusion

Medical factors on mine coal worker has a dominant compared to job factors, while the *Framingham Score* can be a predictor of an abnormal EKG later in life day.

Keywords: Mine coal worker, Framingham Risk Score, Minnesota Code, Abnormalities ST-T



Correlation of Short-term Blood Pressure Variability and Cardiovascular Outcomes in Hypertensive Patient with Coronary Artery Disease

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Background and aim:

Short-term blood pressure variability (BPV) is defined as the average variation in blood pressure throughout the day as measured by the ambulatory blood pressure monitoring (ABPM). Excessive BPV has potential to trigger cardiovascular events, especially in high-risk cardiovascular patients. Short-term BPV has been used as risk stratification, but it is still unclear which subset of BPV is more significant to predict cardiovascular (CV) outcomes, especially in hypertensive patients with coronary artery disease. We sought to investigate correlation between short-term BPV and cardiovascular outcomes in the hypertensive population with coronary artery disease.

Material and Methods:

Retrospective cohort study was conducted in NCC Harapan Kita, involving hypertensive patient with cardiovascular disease underwent 24-hours ABPM. Inclusion criteria were hypertensive patient with documented coronary artery disease (CAD). Data of 107 eligible patient were collected from electronic medical record and followed up from the ABPM examination for at least 1 year or until an event occur. The event is defined as a composite of all-cause mortality, acute coronary syndrome, stroke, heart failure requiring hospitalization, or need of coronary revascularization.

Result:

Out of 107 subjects who met the inclusion criteria, 75 (70.1%) had sustained hypertension. Subset of BPV identified as risers (33%), non-dippers (49.3%), and dippers (17.9%). The morning blood pressure surge (MBPS) was observed in 51.8%. During follow up with median duration of 25 months (1 to 85 months), 25 subjects (23.3%) had cardiovascular outcomes. Multivariate analysis using Cox regression shows that none of the subset of blood pressure variability have significant correlation with cardiovascular outcomes.

Conclusion:

In this sub analysis study short-term BPV is not correlated with cardiovascular outcomes at 1 year follow up. The result suggested that in hypertensive patient with CAD, the time to secondary events need longer follow up period.

Keywords: Keywords: hypertension, blood pressure variability, cardiovascular disease, coronary artery disease

Profile of The Patients with Rheumatic Heart Disease at General Hospital of Dr. M. Djamil Padang in 2019-2022

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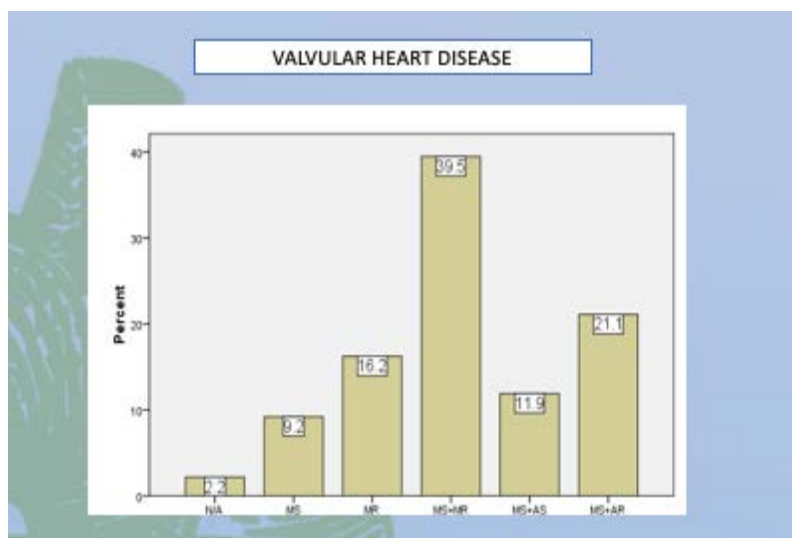
Background and Aim: Rheumatic heart disease (RHD) is a chronic valve disorder that affects approximately 50-80 million people worldwide, particularly children and young adults. The prevalence of RHD is increasing with age and the burden of the disease is higher in developing countries. There hasn't been a national program for treating RHD and it may be one of the causes of the high mortality rate in RHD. This study is an update of the preview study and is expected to be helpful in increasing early detection and preventing complications of RHD in Indonesia, especially in West Sumatra.

Materials and Methods: This was an observational descriptive study with a cross-sectional design to evaluate the characteristics of patients with rheumatic heart disease at the General Hospital of Dr. M. Djamil Padang from 2019-2022. All data were taken from medical records at Dr. M. Djamil Hospital. The sampling was done with total sampling and analyzed using Statistical Package for the Social Sciences (SPSS).

Results: The sample of this study was 185 patients. The result of this study showed that the mean age was 42,78±12,59 years old, majority of the patients female (73%), mostly found with normal BMI (42,6%), systolic blood pressure average 112 ± 17 mmHg, diastolic blood pressure 69.5 ± 13.8 mmHg. Most patients had functional Class NYHA CHF II (64%), History of rheumatic fever (70.8%), and no history of infective endocarditis (96,8%). Majority of the patient had no history of undergoing cardiac surgery (94%), ECG findings flutters or fibrillation (80,5%), and without secondary prevention (68,85%). The complication of RHD mostly involved mitral stenosis and mitral regurgitation (35,5%).

Conclusion: RHD remains the major acquired valvular heart disease. Patients with chronic RHD often presented with complications of the disease or with reactivation of RHD. Majority of the patients will have multivalvular damage.

Keywords: rheumatic heart disease



AN INCREMENTAL VALUE OF RIGHT VENTRICULAR MYOCARDIAL PERFORMANCE INDEX AND RIGHT VENTRICULAR S' TO PREDICT THE RIGHT VENTRICULAR FREE WALL STRAIN: MITIGATING THE RIGHT VENTRICULAR DYSFUNCTION IN PATIENTS WITH MITRAL STENOSIS

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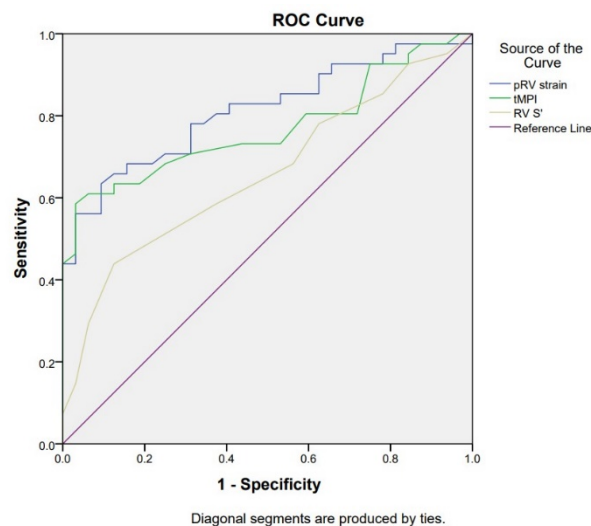
Background and aims: Rheumatic heart disease is still the leading cause of mitral stenosis in developing countries. The thickening and calcification of the mitral valve leaflets lead to left atrial remodeling, increased pulmonary artery systolic pressure and eventually pulmonary hypertension. The deleterious effect of pulmonary hypertension could significantly alter the right ventricular function. This study aimed to mitigate the effect of mitral stenosis on right ventricular function by using standard echocardiography assessment.

Materials and methods: This study evaluated the various right ventricular echocardiography measurements and their correlation to right ventricular free wall strain. The data was collected from echocardiography lab. Patients with concomitant moderate to severe valve diseases, coronary artery disease, and who underwent mitral valve intervention previously were excluded from this study.

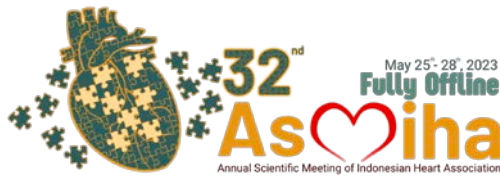
Results: A total of 73 patients with severe mitral stenosis were included in this study. TAPSE, RV S', RV FAC, and tMPI were all correlated well to RV free wall strain (-4.0, -4.0, -1.8, and 0.51, respectively, $p < 0.01$). By using multiple linear regression method, the RV S' and tMPI could explain the RV strain value by 41% (R^2 0.41, $p < 0.01$). By combining RV S' and tMPI using: $-16.7 + 13.4(\text{tMPI}) - 0.54(\text{RV S}')$, it showed that tMPI and RV S' can represent the value of RV strain with good predicted probability (AUC of 0.813) compared to RV S' or tMPI alone (AUC of 0.658 and 0.765, respectively)

Conclusion: RV longitudinal strain is known to have a prognostic factor in patients with RV dysfunction. However, the echocardiography assessment for RV strain is not always accessible. Combining tMPI and RV S' predicts the value of RV strain. This method could also be used in detecting early RV dysfunction as pulmonary hypertension progress and become deleterious in patients with mitral stenosis.

Keywords: Mitral stenosis, pulmonary hypertension, tMPI, RV strain



Combination of RV S' and tMPI (AUC of 0.813) is superior to predict the value of RV strain compared to tMPI or RV S' alone (AUC of 0.765 and 0.658, respectively)



The effect of Glomerular Filtration Rate (eGFR) on Left Ventricular Ejection Fraction (LVEF) in Heart Failure Patients with Chronic Kidney Disease (CKD)

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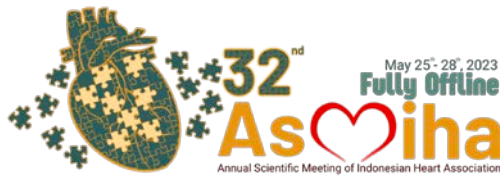
Background and aims: Heart failure (HF) is a major public health problem worldwide, and chronic kidney disease (CKD) is a common comorbidity in HF patients. Left ventricular ejection fraction (LVEF) is a crucial parameter in the diagnosis and management of HF, and its estimation often requires an echocardiography. However, echocardiography is not widely available in some healthcare facilities, while the estimation of glomerular filtration rate (eGFR) is relatively easier to obtain. This study aims to investigate the effect of renal function, as measured by eGFR, in estimating LVEF in HF patients with CKD.

Materials and methods: We conducted a retrospective study on 116 patients with HF and CKD between January 2021 and December 2022. We used the CKD Epidemiology Collaboration (CKD-EPI) formula to calculate the eGFR and obtained LVEF using echocardiography. We used Spearman's correlation to analyze the association between eGFR and LVEF in HF Patients with CKD.

Results: 116 patients with HF and CKD were enrolled in this study, twenty eight (24.1%) patients with HF_{rEF}, thirty three (19.8%) patients with HF_{mrEF}, and sixty four (55.2%) patients with HF_{pEF}. And There were thirty nine (33.6%) patients with CKD Grade 1, twenty eight (24.1%) patients with CKD Grade 2, eleven (9.5%) patients with CKD Grade 3, twenty five (21.6%) patients with CKD Grade 4, and thirteen (11.2%) patients with CKD Grade 5. The study found a significant positive correlation between eGFR and LVEF ($r = 0.296$, $p < 0.05$).

Conclusion: Our study shows a significant positive correlation between eGFR and LVEF in HF patients with CKD. Our findings suggest that declining kidney function is associated with a decrease in LVEF, emphasizing the importance of monitoring and evaluating kidney function in the management of HF.

Keywords: Keywords: eGFR, LVEF, Heart Failure, Chronic Kidney Disease



The Effect of Body Mass Index on Left Ventricular Ejection Fraction in Patients with Valvular Heart Disease

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Background and aims: Obesity has become a significant public health issue in the present era, as many individuals struggle to control their dietary habits and engage in physical exercise. It can increase the risk of cardiovascular diseases such as dyslipidemia, heart failure and others. Therefore, conducting this study to detect Left Ventricular Ejection Fraction (LVEF) early is crucial, as it can aid in preventing it by maintaining an ideal body weight.

Materials and methods: We conducted a retrospective study on 410 patients with valvular heart diseases between January 2021 and December 2022. We used Body Mass Index (BMI) parameter and obtained LVEF by echocardiography. Statistical analysis was conducted using spearman correlation test to investigate the correlation between BMI and LVEF.

Results: 410 patients with valvular heart disease were enrolled in this study. We found 50 underweight patients (12,2%), 225 normoweight patients (54,9%), 55 overweight (13,4%) patients and 80 obese patients (19,5%). We found too 108 patients with EF \leq 40 percent (26,3%), 62 patients with EF 41 – 49 percent (15,1%) and 240 patients with EF \geq 50 percent (58%). The study found a significant positive correlation between BMI and LVEF ($r = -0.142$, $p < 0.05$).

Conclusion: The study found a significant positive correlation between BMI and LVEF ($r = -0.142$, $p < 0.05$), indicating that an increase in BMI can elevate the risk of reduced LVEF.

Keywords: BMI, Obesity, LVEF, Valvular Heart Disease

PREDICTION OF LEFT VENTRICULAR DIASTOLIC DYSFUNCTION USING LEFT ATRIAL STRAIN AND P-WAVE DISPERSION IN PATIENTS WITH HEART FAILURE RISK FACTORS

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 RSUP Prof Kandou Manado²
 Fakultas Kesehatan Masyarakat UNSRAT³

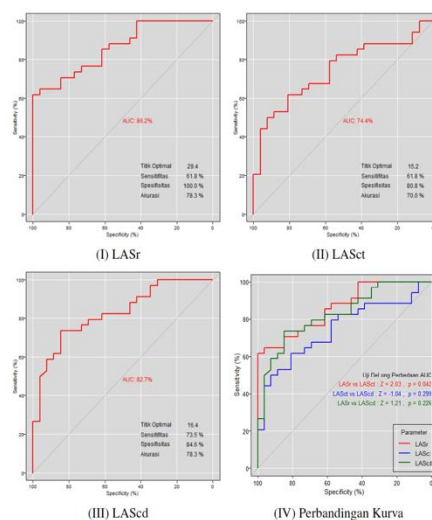
Background and aim: Diastolic dysfunction (DD) is associated with the incidence of heart failure and predicts mortality in patients with cardiovascular risk factors. Prediction of DD using the 2016 American Society of Echocardiography algorithm requires certain types of measurements which are not always applicable. Left atrial strain and P-wave dispersion are hypothesized to be a simpler and earlier predictor of left ventricular diastolic dysfunction in patients with heart failure risk factors.

Material and Methods: This was an analytic observational study with a cross-sectional approach, conducted in November 2021-January 2022. The number of samples were 60 patients with hypertension, type 2 diabetes mellitus, stable coronary heart disease, and obesity. Subjects who met the inclusion criteria underwent anamnesis and physical, laboratory, electrocardiography and echocardiography examinations.

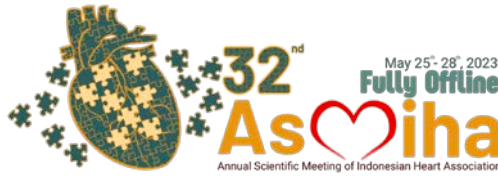
Results: Out of 60 eligible subjects, 62% were male with a mean age of 58.3±10.5. Twenty six samples (43%) had normal diastolic function, 22 had grade I DD, 10 had grade II DD, and 2 had grade III DD. Odds ratio (OR) of LA strain reservoir (LASr), conduit (LAScd) and contraction (LASct) in detecting DD were 0.74, 0.72 and 0.72 respectively (p<0.05). ROC curve analysis showed area under curve (AUC) of 0.86 for LASr, 0.82 for LAScd, and 0.74 for LASct in predicting DD with sensitivity and specificity of 68.1% and 100%, 73.5% and 84.6%, and 61.8% and 80.8%, respectively. The value of LA strain appeared to decrease as the degree of DD increased. Regression and ROC curve analysis showed no relationship between P-wave dispersion with diastolic dysfunction.

Conclusion: All three phases of LA strain were able to detect LV diastolic dysfunction and predict its degree in patients with heart failure risk factors with a fairly good performance, while P-wave dispersion did not show the same property.

Keywords: left atrial strain, diastolic dysfunction, P-wave dispersion, heart failure



ROC Curve - Prediction of LV Diastolic Dysfunction by Left Atrial Strain



Potential Cardioprotective Effect of Vitamin D and Sodium-Glucose-Co-Transporter-2 Inhibitor (SGLT-2i) in Improving Cardiac Hypertrophy and Fibrosis in Type 2 Diabetic Rats

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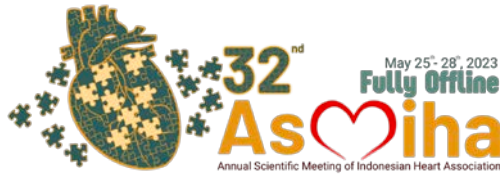
Background and Aim. Diabetes mellitus (DM) is a major risk factor for the incidence and progression of cardiovascular disease. The progression of myocardial abnormalities due to DM occurs slowly but is progressive and asymptomatic. SGLT-2i and vitamin D have a potential cardioprotective properties to inhibit cardiomyocyte fibrosis and hypertrophy, which is one of the early structural changes that occur in the hearts of DM patients. We aim to determine the possible protective effect of SGLT-2i and vitamin D administration on cardiac hypertrophy and fibrosis in type 2 diabetic rats.

Materials and Method. This is an experimental study with a post-test only control group design. Thirty-two male Wistar rats were given a high-fat/high-glucose (HF/HG) diet. After 3 weeks, rats were given an injection of streptozotocin (STZ 35 mg/kg) to induce pancreatic damage. The diabetic rats were then divided into four groups (each, n=8): untreated diabetic group (HF/HG/STZ), the diabetic group treated with empagliflozin 10 mg/kgBW (HF/HG/STZ+EMPA), the diabetic group treated with vitamin D 225 IU/day (HF/HG/STZ+VITD), and the diabetic group treated with a combination of empagliflozin 10 mg/kgBW and vitamin D 225 IU/day (HF/HG/STZ+EMPA+VitD). Treatments were given by oral gavage for 8 weeks. Left ventricular biopsy was performed at week thirteen to examine collagen deposition, cross-sectional area cardiomyocyte, and mRNA expression of b-myosin heavy chain (b-MHC) and transforming growth factor-b (TGF-b). All the obtained data were analyzed statistically.

Results. Empagliflozin, vitamin D, and combination therapy reduced the mRNA expression of b-MHC and TGF-b in diabetic rats compared to the untreated diabetic group. Cardiomyocyte cross-sectional area and collagen deposition were also decrease with administration of empagliflozin, vitamin D and combination therapy. Compared to monotherapy, combination therapy led to significantly better parameter reduction.

Conclusion. Administration of empagliflozin, vitamin D, and combination therapy improved cardiac hypertrophy and fibrosis in type 2 diabetic rats.

Keywords: Cardiac hypertrophy, cardiac fibrosis, diabetic rats, empagliflozin, vitamin D.



Predicting Left Ventricular Hypertrophy using QT Interval in Patients with Coronary Artery Disease

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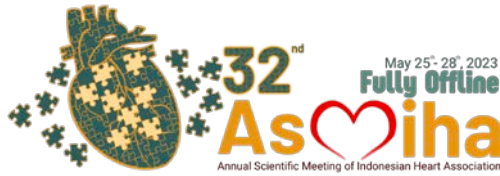
Background and aims: Left ventricular hypertrophy (LVH) is a common complication of hypertension, can lead to cardiovascular disease and death. Early detection and management of LVH are crucial to prevent adverse cardiovascular outcomes. Several methods have been proposed to diagnose LVH, a reliable and non-invasive approach is still needed. Therefore, this study aims to investigate the potential of using the QT interval on electrocardiogram (ECG) as a novel predictor of LVH.

Materials and methods: We conducted a retrospective cohort study of 46 CAD patients who underwent both electrocardiography (ECG) and echocardiography. QT interval was measured from the ECG and LVH was defined as left ventricular mass index (LVMI) > 95th percentile for age and sex. Logistic regression models were performed to examine the association between QT interval and LVH, adjusting for age, sex, body mass index, and other relevant clinical factors. Receiver operating characteristic (ROC) curve analysis was conducted to determine the optimal cut-off value for the QT interval to predict LVHs

Results: Among the 46 CAD patients included in the study, 16 (35%) had LVH. The mean QT interval was significantly longer in patients with LVH than those without (384 ± 40 vs. 419 ± 39 ms, $p < 0.001$). Logistic regression analysis showed that QT interval was a significant predictor of LVH ($p < 0,05$), even after adjusting for other clinical factors. The optimal cut-off value for QT interval was 404 ms, with a sensitivity of 73% and specificity of 82%.

Conclusion: Our study suggests that QT interval is a useful predictor of LVH in CAD patients, even after adjusting for other clinical factors. A QT interval of 404 ms may be used as a cut-off value for identifying CAD patients at risk for LVH.

Keywords: QT Interval, Left Ventricular Hypertrophy, Prediction, Coronary Artery Disease



The Relation Between ADMA with Subclinical Miocard Injury in CKD Patients

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Background and aims

One of the markers of endothelial dysfunction is ADMA. Circulating ADMA levels are directly and significantly related to CRP and IL-6, suggesting that inflammation and endothelial dysfunction are parallel processes in end-stage CKD patients.

Material and Methods

This analytic observational study with a cross-sectional study was conducted in the Hemodialysis Installation of Prof. Dr. R. D. Kandou Hospital, Manado, May 2022 to October 2022. The sampling method was carried out by consecutive sampling, namely all patients undergoing hemodialysis.

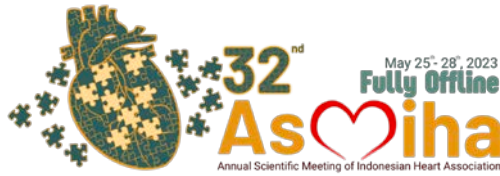
Results

Descriptive analysis data for 30 research samples obtained a median value of 56.5 years, a minimum value of 32 years and a maximum value of 60 years. The duration of HD in this group has a median of 3 years, a minimum value of 2 years and a maximum of 5 years. The ADMA value data in this group has a median value of 104 ng/ml, a minimum value of 71 ng/ml and a maximum of 168 ng/ml. The results showed that there was a significant relationship between Endothelial Dysfunction (ADMA levels) and Cardiac Troponin I (HsTrop I) in chronic kidney failure patients ($p=0.011$; $r=0.457$).

Conclusion

There is a significant relationship between HsTropI levels and endothelial dysfunction in patients with Chronic Renal Failure. There is no significant relationship between Mean Platelet Volume and HsTropI in Chronic Kidney Failure patients.

Keywords: ADMA, Miocard Injury, CKD



CIRCADIAN PATTERNS OF PREMATURE VENTRICULAR COMPLEX BURDEN: A PROPOSED PSYCHO-NEURO-ENDOCRINE MECHANISM

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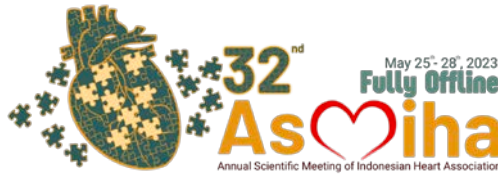
Background and Aim: Recent data shows that PVC burden exhibits one of the three circadian patterns, namely fast-type, slow-type, and independent-type PVC; and the mechanism(s) underlying this phenomenon is unclear.

Material and Methods: This cross-sectional observational study recruited 23 fast-, 20 slow-, and 22 independent-type idiopathic PVC patients, as well as 5 control subjects. Participants were questioned about sociodemographic characteristics and perceived stress scale score, after which they underwent a 24-hour Holter to examine PVC burden and heart rate variability (HRV), recorded their self-rated health scales, and collected saliva for cortisol and norepinephrine examination at 6-7 am, 10-11 am, and 10-11 pm. To investigate the associations between circadian rhythms of the independent variables and circadian rhythms of PVC burden, univariate and multiple linear regression were conducted.

Results: The average PVC burden was 15.7%, 8.4%, and 13.6% respectively in fast-, slow-, and independent-type idiopathic PVCs. For all 65 patients, stress levels were slightly higher than average. Multiple linear regression showed that higher cortisol levels and lower parasympathetic nervous system tone are at higher risk of higher burden of fast-type idiopathic PVC. Lower cortisol levels and lower sympathetic nervous system tone are at higher risk of higher burden of slow-type idiopathic PVC. Higher cortisol levels and sympathetic nervous system tone as well as lower self-rated health scales are at higher risk of higher burden of independent-type idiopathic PVC.

Conclusion: We propose that hypothalamic-pituitary-adrenal (HPA) axis, sympathomedullary system (SMS), and psychological mechanisms are involved in the existence of PVC burden circadian patterns. These findings also support the plausibility and need for further investigation of chronotherapy for PVC patients.

Keywords: idiopathic PVC, circadian rhythm, cortisol, autonomic nervous system, self-rated health scale



Unpredicted Correlation of Metabolic Syndrome (MetS) Component, Lipid Ratio with 6MWT as Cardiovascular Risk Event in Elderly of Hajj Pilgrims

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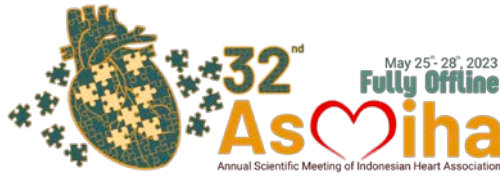
BACKGROUND & AIMS: Hajj pilgrims, mostly dominated by elderly age, are at risk of having co-morbidities. Screening strategy is needed to anticipate cardiovascular problems during hajj, including 6minutes walking test (6MWT) as a fitness test. The aim of this study was to analysis the correlation of metabolic syndrome (MetS) component, lipid ratio with 6MWT in elderly of Hajj pilgrims.

MATERIALS AND METHODS: This cross-sectional study is conducted in Medical Faculty of Airlangga University. There were 1499 of Indonesian Hajj pilgrim 2020-2022 whom underwent fitness screening. With SPSS 22.0 the correlation between 6MWT, MetS component, and lipid ratio Castelli's Risk Index (CRI) II were done using contingency coefficient and spearman test.

RESULTS: There were 811 women dominates the elderly of Indonesian hajj pilgrim. The two most of cardiovascular risk factors, obesity and high LDL-C (>100 mg/dL), had been in almost 2/3 samples. Whereas, the other MetS component, high CRI II, and low 6MWT whom reached distance \leq 500 meters only in a few people. Sex ($p<0.001$), SBP ($p<0.001$), LDL-C ($p<0.001$), fasting plasma glucose (FPG) ($p=0.032$), and CRI II ($p=0.002$) had significant correlation with 6MWT ($p<0.05$; 95%CI). There was no significant correlation between body mass index, heart rate, HDL-C, triglyceride, glucose 2hours post prandial with 6MWT.

CONCLUSION: Most of Indonesian elderly hajj pilgrim had obesity and high LDL-C. The SBP, FPG, CRI II, and 6MWT can be considered to get attention of cardiovascular risk event during hajj pilgrimage.

Keywords: 6MWT, Elderly, Cardiovascular Rehabilitation, Hajj pilgrims



QTc as a Predictor of Mortality during Hospitalization in Acute Coronary Syndrome Patients

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Background and aims

The QT interval is the time it takes for the ventricle to repolarize after depolarization. QT interval has been reported as a predictor of arrhythmias after life-threatening acute myocardial infarction, sudden cardiac death, and other MACes. The aim of this study was to evaluate QT interval as a predictor of mortality during hospitalization in acute coronary syndrome patients.

Materials and Methods

The QT interval was calculated by Bazett and Frederica formula to generate corrected QT interval. 159 patients with acute coronary syndrome was included in this observational study retrospectively. Noncardiac confounding factor has been excluded previously. QTc was calculated on the first medical contact at the emergency department. The in-hospital mortality included all-cause mortality during treatment in hospital. After determining a prediction power, the optimal cut-off point of QTc was identified.

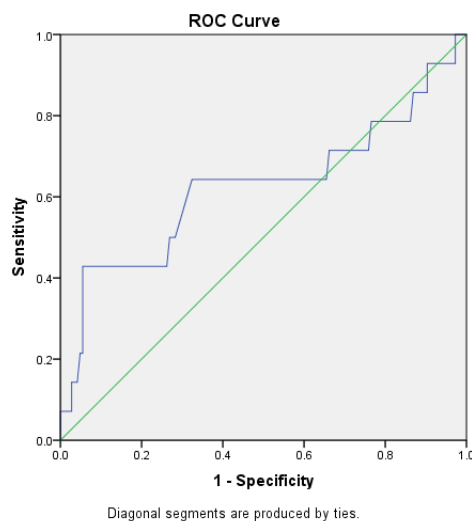
Results

The mean age was $60,1 \pm 10,91$ years old and more than 78% of them were male. A comparison of ROC curves is then performed to determine the index with the strongest predictive power. QTc may be considered as the predictor of mortality in ACS patients with satisfied prediction power (AUC=0.623). The analysis also found that $QTc > 439$ was the best cut-off point for predicting in-hospital mortality in ACS patients.

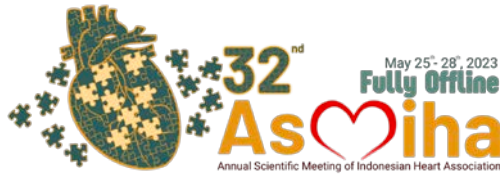
Conclusion

QTc can be used as a predictor of mortality during hospitalization in patients with acute coronary syndrome.

Keywords: QTc, acute coronary syndrome, mortality



The prediction power assessed using the AUC-ROC demonstrated satisfied prediction power



Predictors of Return to Work in Patients After Coronary Artery Bypass Grafting Surgery Who Underwent Early Phase Two Cardiac Rehabilitation Program in a National Cardiovascular Center in Indonesia

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Background and aim

To identify the influence of early phase II cardiac rehabilitation (CR) program and other predictors associated with return to work (RTW) in patients who underwent CABG.

Materials and Method

This is a cohort study using registry data from January 2017–December 2018 from patients who were underwent CABG in productive age (under 55 years old) and were employed prior to surgery and have completed CR program for 12 sessions. Primary outcome of this study is return to work, followed up using telephone interview with minimum duration 1 year after CABG.

Result

There were 208 patients who met inclusion criteria in this study. 182 (87.5%) patients returned to work within 12 months, with median time to RTW is 1.5 month. 119 (65.6%) and 158 (87.2%) patients return to work within 2 months and 6 months after the surgery, respectively.

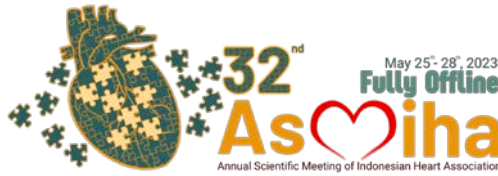
In the univariate analysis, demographic, socioeconomic, occupational, psychological, medical factors, and cardiac rehabilitation program parameters (functional capacity from 6MWT and treadmill test (TMT)) had a statistically significant correlation with return to work.

In multivariate analysis, family economic demand, occupation type (blue collar vs white collar), working duration before surgery, doctor's support, and functional capacity by 6MWD after CR program are included in final model as independent predictors of return to work (table 1), with C-statistic=0.952, p=0.001. Sub-analysis showed that 6MWD post-CR cut-off as predictor of RTW was best found at 290 meters (sensitivity 71% and specificity 65%)

Conclusion

In our current study, we identified that functional capacity after CR program (6MWD) is a new medical independent predictor of RTW. Thus, early phase II CR program after CABG is effective in achieving faster RTW in the productive age population. Besides that, support from doctor and health care provider also play an important role for patient decision to RTW.

Keywords: cardiac rehabilitation, return to work, 6MWD



Benefit of micro T-Wave Alternation from ECG Dispersion Mapping in Developing Modified Jakarta Cardiovascular Score as a Novel Risk Predictor Model for the Re-classification of Coronary Arterial Disease Probability in High-Risk Population in Indonesia

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Background and Aim

Jakarta Cardiovascular Score (JAKVASCORE) has been widely used for cardiovascular risk assessment in Indonesia. This study aims to re-classify high risk population for the risk of coronary artery disease (CAD) by adding micro T-wave alternation (mTWA) to develop a modified JAKVASCORE.

Material and Methods

This was a case-control of study performed in October-November 2019. High risk population was defined as score > 5 from JAKVASCORE, and then grouped into patients with (case-group) and without (control-group) CAD based on ESC guideline. mTWA was calculated in these patients using low oscillation Amplitude Oscillations Conventional ECG signals (ECG dispersion mapping). Re-classification was analyzed by logistic-regression and C-statistic method, calibration and discrimination used Hosmer lemeshow of more than 0.05 and discrimination used AUC of >0.7.

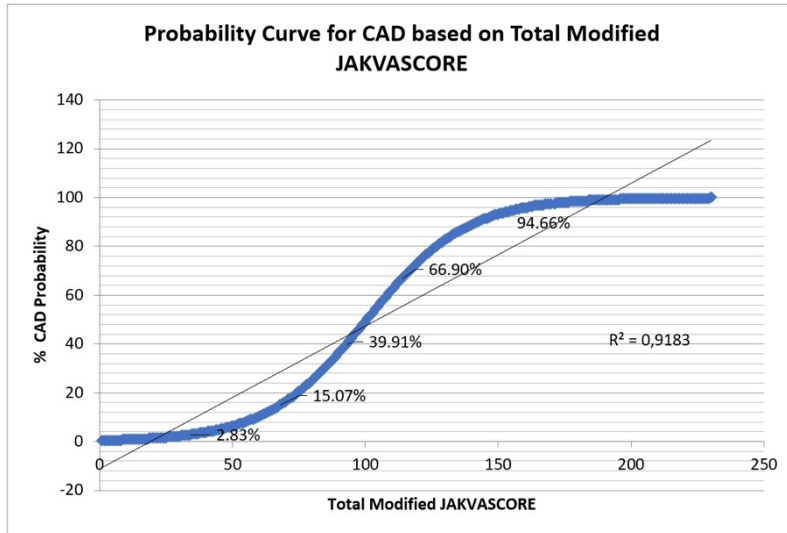
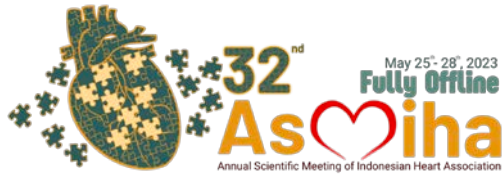
Result

A total of 101 patients were included in this study. There are 38% CAD cases in this population. There was a significant difference of mTWA between the two groups, with most optimum cutoff at 20 μV ($p=0.000$). Modified JAKVASCORE with component variable of age, gender, blood pressure, smoking habit, diabetes history, physical activity status, and the addition of mTWA had a total score of 230, with the R^2 0.9183, AUC 0.889, and significance of 0.000. A total score of ≥ 90 was categorized as moderate-high risk of developing CAD, with sensitivity of 80% and specificity of 70%. The novelty of our study is the addition of mTWA to the total score, which result in very good discrimination power and better reliability compared with traditional JAKVASCORE in early detection of CAD (C-statistic 0.89 with mTWA vs 0.67 without mTWA).

Conclusion

This modified JAKVASCORE with the addition of mTWA is an effective yet simple screening tool to reclassify the CAD risk among high-risk populations and might serve as an addition to pre-test probability score analysis for CAD early detection.

Keywords: CV risk score, mTWA, ECG dispersion mapping, JAKVASCORE





Descriptive analytic study of histopathologic finding of post-mortem Severe COVID-19 patient from cardiac core biopsy: Does D-Dimer play a role in microvascular coronary thrombosis?

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Background and Aim

Microvascular coronary thrombosis is one of the emerging risk factors which worsen the prognosis of COVID-19 patients. This study aims to show for the first time a descriptive of histopathologic findings from post-mortem COVID-19 patients and to analyze whether D-Dimer serum level, marker of hyper-coagulopathy, correlates with microvascular coronary thrombosis from cardiac core biopsy.

Material and Method

This was an observational analytic study with retrospective cohort design from July-December 2020. Cardiac core biopsy was taken from patients who died while being treated at the isolation ICU at RSUD dr. Soetomo due to severe COVID-19. The samples were taken in 1 hour post-mortem, and then analyzed histopathologically with Hematoxylin-eosin staining under light microscope, to evaluate the presence of microvascular coronary thrombosis and other pathological findings from cardiac biopsy. Clinical information and D-Dimer level from medical record and analyzed to microvascular coronary thrombosis using Man-Whitney and C-statistic analysis using SPSS 22 software.

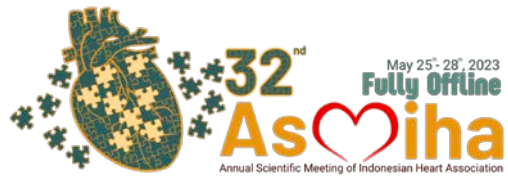
Result

There were 34 samples of post-mortem patients in this study. Majority were men (75.3%), with mean age of 48.23 years old. Focal microvessel coronary thrombosis were found in 30% (Figure 1) (Table 1). Mean D-Dimer level was increased from normal baseline (11,730 mg/dl), however, there were no significant difference in D-dimer levels between focal microvessel coronary thrombosis incident (p value 0.842, C-statistic AUC 0.492). The lack of focal necrosis in the surrounding tissue suggests that the thrombosis resulted from proximal embolization to distal capillary coronary which already happened before, rather than primary in-situ process in microvascular, hence may explain why D-Dimer were not correlated with the finding of microvascular coronary thrombosis in this study.

Conclusion:

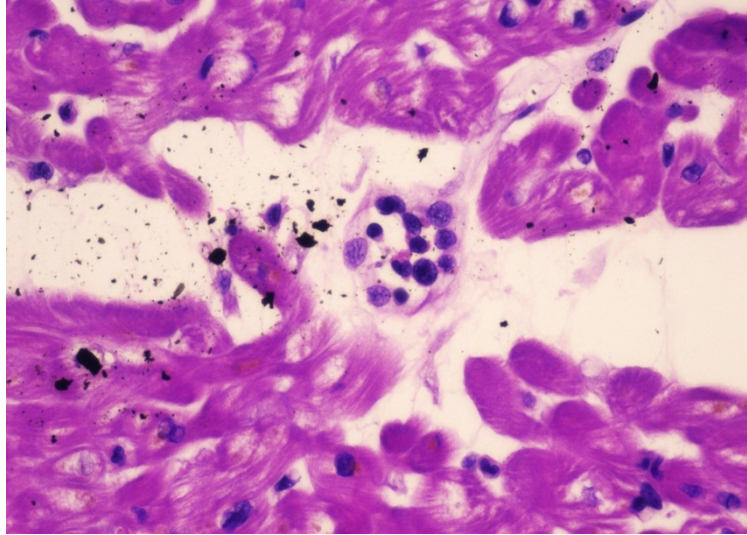
D-dimer serum levels were not associated with focal microvascular thrombosis in post-mortem COVID-19 patients. This result supports previous studies that showed D-Dimer was not sensitive to detect thrombosis in microvascular.

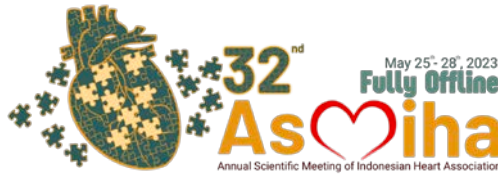
Keywords: histopathologic, microvascular coronary thrombosis, post-mortem, COVID-19



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Correlation Between Influenza and Acute Coronary Syndrome (revision)

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RSUD RAA Soewondo Pati¹

Background and aims: Acute respiratory infections, including influenza, can lead to myocardial infarction through multiple mechanisms. Influenza infection triggers an inflammatory immune response and promotes destabilization of coronary lesions prone to rupture or erosion. Myocardial infarction and cardiac mortality increase during winter and following influenza epidemics. This study aimed to determine the association between influenza and Acute Coronary Syndrome (ACS) patients.

Material and methods: Data collection was carried out retrospective cross-sectional through the questioner to patients who confirmed Acute Coronary Syndrome who were treated in RSUD RAA Soewondo Pati in September 2022 – February 2023. Patients with a diagnosis of ACS will be anamnesis about their previous history of influenza.

Results: From a total 37 patients, 19 patients (51.4%) were diagnosed with STEMI, and 18 patients (48.6%) were diagnosed with NSTEMI/UAP. Based on the influenza history, 7 patients (18.9%) didn't have influenza, and 30 patients (81.8%) had influenza history. The 30 patients who had influenza history were classified into 10 patients (27%) who had a history of influenza 1-7 days, 14 patients (37.8%) who had a story of influenza 8-30 days, and 6 patients (16.2%) who had a story of influenza >30 days. On Fisher's exact test, p-value =1, so there was no statistically significant association between ACS and history of influenza

Conclusion: Some patients with ACS have a history of influenza. The incidence of influenza may trigger ACS. But in our study, the result shows that the correlation between ACS and influenza were not significant. Further research with a large sample size is needed.

Keywords: Influenza, ACS

Differentiation of Major Adverse Cardiovascular Events in Patients with Acute Myocardial Infarction Elevation of Inferior ST-Segment with Complication of High-Degree Atrioventricular Block Which is Performed and Not Performed a Temporary Pacemaker

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Background and Aim

The incidence of a high-degree atrioventricular block (HAVB) in STEMI has quite a large impact on patient morbidity and mortality. Most cases require the placement of a temporary pacemaker (TPM). However, several studies have shown that TPM installation increases the risk of major adverse cardiovascular events (MACE). This study wants to compare MACE in STEMI patients with HAVB complications who had TPM installed versus those who did not have TPM installed.

Materials and Methods

This is an observational study with a cross-sectional design using secondary data from patients hospitalized at Dr. Sardjito General Hospital with STEMI inferior and HAVB complications. The collection of basic characteristic data, and then all independent variables in the numerical or categorical form will be subjected to a bivariate test.

Result

218 subjects met the inclusion criteria. Data related to MACE in the TPM group showed a higher number than without TPM (48.2% vs 30.4%, $p = 0.015$). With criteria for shock conditions that were also higher in the TPM group (38.1 vs 24.1%, $p = 0.037$), Data on mortality (29.5% vs 15.2%, $p = 0.021$), data on severe complications and the incidence of stroke during hospitalization (4.7% vs 0.9%, $p = 0.218$) and reinfarction (3.8% and 3.6%, $p = 1,00$) Data on conduction reversibility >3 days were higher in the TPM group (43.2%, $p = 0.18$) and data on length of stay >5 days were also higher in the TPM group (34.5%, $p 0.001$).

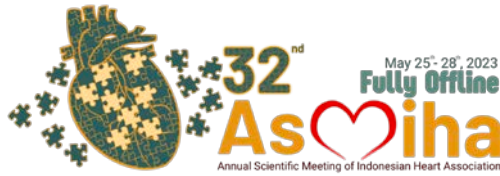
Conclusion

MACE was found to be more common in subjects who had TPM installed compared to those who did not have TPM installed. Furthermore, the outcome of conduction system reversibility > 3 days and length of hospitalization > 5 days were found to be higher in the TPM group than in the non-TPM group

Keywords: Major adverse cardiovascular events, High-degree atrioventricular block, temporary pacemaker, reversibility of conduction system, length of stay

Variable	Group 1 (Without TPM) (N=79)	Group 2 (With TPM) (N=139)	p value	Variable	Group 1 (Without TPM) (N=79)	Group 2 (With TPM) (N=139)	p value
MACE (%)	24 (30,4%)	67 (48,2%)	0,015	Mean of reversibility conduction	2 ± 2 days	4 ± 2 days	0,018
Shock	19 (24,1%)	53 (38,1%)	0,037	Reversibility conduction > 3 days	23 (29,1%)	60 (43,2%)	0,015
Re-infarction	3 (3,8%)	5 (3,6%)	1,000	Mean of length of stay	5 ± 2 days	7 ± 5 days	0,001
Stroke	2 (0,9%)	10 (4,7%)	0,218	Length of stay > 5 days	8 (10,1%)	48 (34,5%)	<0,001
Dead	12 (15,2%)	41 (29,5%)	0,021				

Outcome data of MACE, Reversibility of conduction system, and Length of stay



The Cardiovascular Disease Burden in Indonesia: A Systematic Analysis of The Global Burden Disease Study - Trends from 1990 to 2019

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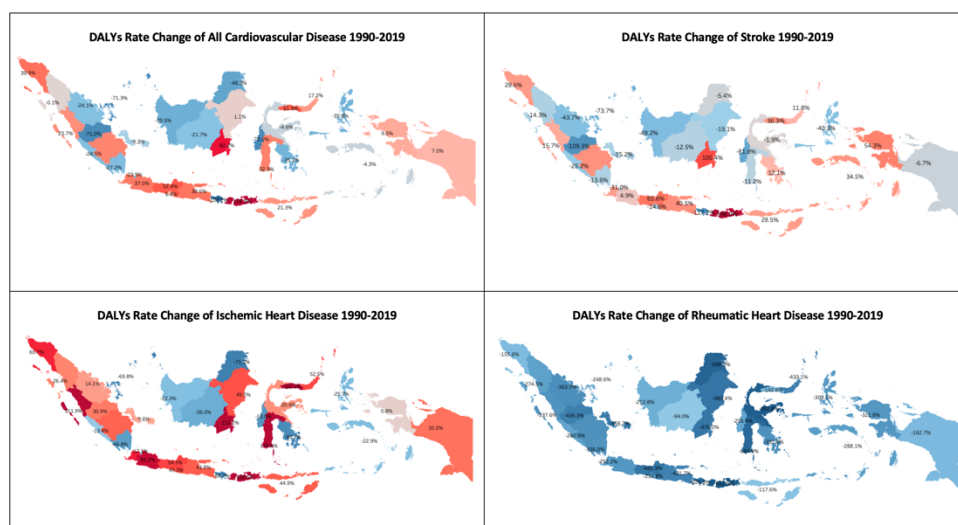
Background and Aim: Reducing the cardiovascular burden is in accordance with ESC's motto. Therefore, Indonesian CVD burden assessment will play an essential role as the basis of the disease intervention. This study aimed to progressively define the burden of cardiovascular disease in Indonesia from 1990 to 2019. This research will serve as a foundation for policymakers to prevent cardiovascular disease and improve cardiovascular healthcare.

Materials and Methods: We used IHME-GBD data to analyse the 1990-2019 trends of the cardiovascular burden, including 12 underlying diseases, due to their mortality, morbidity, and prevalence. Morbidity was assessed through DALYs (Disability-adjusted life years). We provide information on the national and provincial level along with the benchmark from other Southeast Asia countries and a global perspective.

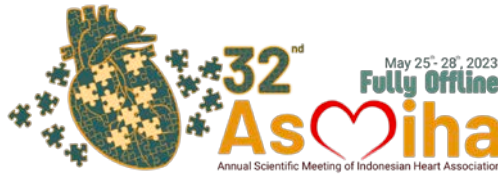
Results: CVD deaths have doubled from 278 million in 1990 to 651 million in 2019. All cardiovascular diseases experienced an incline in the death rate, except for RHD (-69%) and CHD (-37%). In sequence, stroke and IHD remained the leading cause of mortality and morbidity in Indonesia, while stroke and PAD were the most prevalent cardiovascular diseases. Compared to ASEAN countries, Indonesia turned out to be the second worst CVD DALYs rate country after Laos. At the province level, the most CVD DALYs rate were demonstrated in Bangka-Belitung, South Kalimantan, and Yogyakarta. Whereas in terms of DALYs rate change, they were West Nusa Tenggara (24%), South Kalimantan (18%), and Central Java (11%). Regarding the sex groups, only RHD and PAD burden was dominated by the female sex.

Conclusion: Overall, there is still an increase in the mortality, morbidity, and prevalence of cardiovascular disease in Indonesia during the given period. These data could be accounted as a reference point for stakeholder policy-making, such as risk factor prevention, health care optimisation, and target determination.

Keywords: Cardiovascular Disease, Burden, Death, DALY, Policy-making.



Choropleth of Changes in ASR DALYs between 1990-2019 for Selected Cardiovascular Diseases in All Indonesia Provinces



Evaluation of Potential Cardiovascular Adverse Events of Remdesivir and Favipiravir in COVID-19 Patients

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Background and aim: COVID-19 is a respiratory disease caused by SARS-CoV-2 and may lead to significant morbidity and mortality. Remdesivir and favipiravir are antiviral drugs with clinical trial data demonstrating therapeutic benefits in COVID-19 patients. Although promising, the cardiovascular side effects of these drugs should be considered. Further studies are needed to assess their safety profile and potentially adverse cardiovascular events. This study aims to evaluate the potential cardiovascular adverse events of remdesivir compared to favipiravir in hospitalized adult patients diagnosed with COVID-19.

Material and methods: We conduct is a single-centre retrospective cohort study that analyzed data from an active surveillance program database of hospitalized patients with moderate-severe COVID-19 who received remdesivir or favipiravir from January 1st – July 31st, 2022. We recorded cardiovascular side effects such as hypotension, arrhythmias, prolonged QT interval, heart failure, and cardiovascular mortality events.

Results: We enrolled total 180 COVID-19 patients, 56,7% men with mean age 56.96 ± 13.95 years. Patients were divided into 2 groups who received either remdesivir (n=55) or favipiravir (n=125). Patients treated with remdesivir are significantly to have more hypotension events (12.7% vs 4%; $p=0.031$). Meanwhile, prolong QT interval is more common in favipiravir group (7.3% vs 19.2%; $p=0.046$). Bradycardia and atrial fibrillation witnessed higher incidence in remdesivir group but without significant differences (9.1% vs 4.8%; $p=0.268$ and 16.4% vs 9.6%; $p=0.193$, respectively). Patients receiving remdesivir and favipiravir were likely to have similar in hospital mortality-related cardiovascular events.

Conclusion: Our study result shows that remdesivir and favipiravir have some adverse cardiotoxic and proarrhythmic effects when administered in moderate-severe cases of COVID-19. Further study with a larger sample is needed to evaluate the safety of these drugs, especially their side effect on cardiovascular system.

Keywords: remdesivir, favipiravir, antiviral, COVID-19, cardiovascular

HEALTH COUNSELING ABOUT RISK FACTORS AND HYPERTENSION PREVENTION IN THE COMMUNITY TO REDUCE HYPERTENSION RATE IN THE WORK AREA OF SUNGAI BILU PUBLIC HEALTH CENTER

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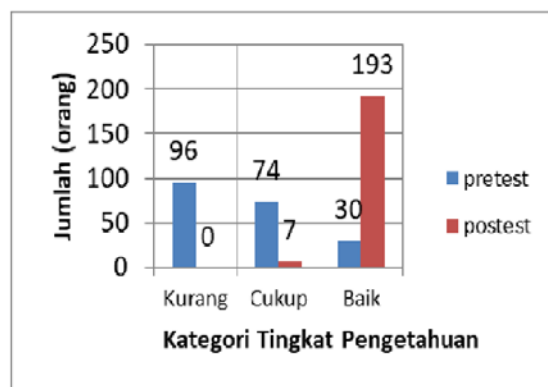
Background and aims : The results of the 2018 (Riskesdas) survey showed that the prevalence of hypertension in Indonesia reached 34.11%. South Kalimantan Province ranks first the prevalence of hypertension based on the results of blood pressure measurements in people aged > 18 years, which is 44.13%. Banjarmasin itself ranks 4th out of 13 regencies/cities, which is 46.79% of the prevalence of hypertension. At the Sungai Bilu Public Health Center, hypertension has always been ranked first from 2019-2021.

Material and Methods : a survey was conducted on 200 respondents who experienced hypertension in the Sungai Bilu Health Center work area, it can be seen that there are several internal and external factors that cause the high incidence of hypertension. Furthermore, priority problem solving is set in the form of counseling to the public about the risk factors for hypertension with media (leaflets, power point slides) to prevent the occurrence of hypertension in the community.

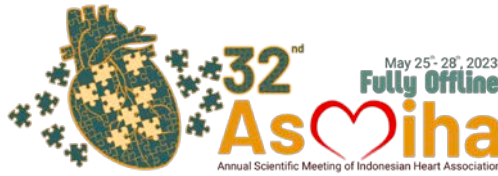
Result : Based on the knowledge level category, at the pretest there were still 96 respondents (48%) who had deficient knowledge. The number of respondents who have fair category is 74 people (37%). After receiving counseling, the category of respondent's knowledge level was 96.3% (193 people) good, only 7 person (3.7%) still had fair category. The normality test used the Shapiro-Wilk test with $p=0.034$ in the pretest value and $p=0.001$ in the posttest value which indicated that the data distribution was not normally distributed because $p<0.05$ so the Wilcoxon test was chosen for data analysis with the results obtained $p = 0.001$ which showed that there was a significant change in the level of knowledge between before and after being given counseling about hypertension.

Conclusion : With proper counseling and according to the problems found, it is proven to reduce hypertension rates in certain areas

Keywords: hypertension, knowledge, counseling



Distribution of Community Knowledge Levels Before and After counseling Based on Knowledge Level Categories



Predicting Successful Chronic Total Occlusion (CTO) Recanalization: Indonesian Clinical Angiography Characteristic (Indo-CTO) Score is Superior To Multicenter CTO Registry of Japan (J-CTO) Score, EURO-CTO (CASTLE) Score and Clinical Angiography (CL) Score

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Backgrounds and Aims The success rate in the recanalization of chronic total occlusion (CTO) varies based on characteristics of lesions and methodical percutaneous coronary intervention (PCI). Hence, CTO scoring systems are developed to assess probable procedural accomplishment. This study compared the recent Indo-CTO score to several commonly used scoring models with similar variables (CASTLE score, J-CTO score, and CL score) in identifying the CTO PCI procedural success.

Materials and Method: Four scores were calculated using 74 consecutive data from patients who underwent elective CTO PCI in Integrated Heart Service Center, General Academic Hospital Dr. Soetomo, Surabaya, East Java. The calibration, discrimination, and reclassification among the scores were analyzed and compared using SPSS 26 and STATA 17.

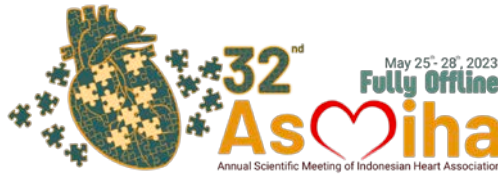
Results: The overall success rate of CTO PCI was 58.1% with higher lesion complexity distributions compared to each score's original derivation cohort. Median score values were: Indo-CTO 3.00 ± 2.11 , CASTLE 1.00 ± 1.05 , J-CTO 1.00 ± 0.90 , and CL 2.00 ± 1.23 . Calibration

using Hosmer-Lemeshow goodness-of-fit test showed good value ($p > 0.05$) for all scores. For discrimination, using the area under the curve (AUC), Indo-CTO score (0.802, 95% CI: 0.700-0.904) demonstrated significant higher capacity ($p < 0.005$ and p -Bonferroni < 0.01) among all scores—CASTLE 0.729, 95% CI: 0.612-0.847; J-CTO 0.705, 95% CI: 0.586-0.823;

CL 0.728, 95% CI: 0.610-0.845; with AUC difference 0.073, 0.097, and 0.073, respectively. Reclassification using integrated discrimination improvement (IDI) index showed that Indo-CTO score was superior to other scores—CASTLE +0.1344, $p = 0.001$; J-CTO +0.1306, $p = 0.0008$; CL +0.1237, $p = 0.0019$. However, using categorical net reclassification improvement (cNRI) index at 50% cut-off point, all scores showed overall similar reclassification ability, although Indo-CTO score still reclassified toward better trend among all scores—CASTLE +0.037, $p = 0.732$; J-CTO +0.213, $p = 0.053$; CL +0.179, $p = 0.110$.

Conclusions: Indo-CTO scoring system has better overall performance compared to the other scores. The pre-intervention use of it to evaluate possible success towards the procedure is highly suggested.

Keywords: Keywords: Keywords: Chronic Total Occlusion, Percutaneous Coronary Intervention, Clinical Scoring System, J-CTO Score, CASTLE Score, CL Score



Biologically active adrenomedullin (bio-ADM) as a novel biomarker of severity and risk stratification in patients with pulmonary artery hypertension: an insight from COHARD-PH registry

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Background and aims: Biologically active adrenomedullin (bio-ADM) is a vasoactive peptide with a key role in improving vascular hyperpermeability, induce vasodilation, and stabilise the endothelial barrier preventing endothelial dysfunction. Bio-ADM has been studied in population with pulmonary artery hypertension (PAH), and showed significant correlation with poor outcome and mortality. This study aimed to investigate the value of plasma bio-ADM in relation to PAH invasive and non-invasive hemodynamics, risk stratification, and another biomarker (N-terminal-pro brain natriuretic peptide/NT-proBNP) level.

Materials and Methods: This was a cross-sectional study involving subjects who were recruited from COngenital HeARt Disease and Pulmonary Hypertension (COHARD-PH) registry, and divided into two groups, (1) atrial septal defect-associated pulmonary hypertension (ASD-PAH) and idiopathic/hereditary (I/H) PAH. Data were collected from registry database, such as baseline demographic data and echocardiographic data. Right heart catheterization (RHC) was performed at the time of diagnosis. Plasma sample was taken during RHC and assayed for bio-ADM using chemiluminescence immunoassay. Statistical analyses were performed using IBM SPSS Statistics v. 26 (Chicago, IL, US). Statistical significance is p -value < 0.05 .

Results: This study enrolled 100 subjects, comprised 85 ASD-PAH and 15 I/H-PAH. Compared to ASD-PAH group, mean plasma bio-ADM levels (pg/mL) in I/H-PAH group was significantly higher (17.64 ± 15.5 vs. 10.5 ± 12.8 , $p = 0.005$). However, plasma bio-ADM at diagnosis is not correlated with 6MWD ($r = 0.021$, $p = 0.43$), NT-proBNP level ($r = 0.098$, $p = 0.19$) pulmonary vascular resistance index ($r = -0.009$, $p = 0.46$), mean pulmonary arterial pressure ($r = -0.089$, $p = 0.19$), and mean right atrial pressure ($r = 0.163$, $p = 0.054$). Lower Bio-ADM level tended to associate with milder severity by mPAP ($p = 0.62$) and lower risk stratification score using 2015 ESC/ERS COMPERA risk scores ($p = 0.249$).

Conclusion: Plasma bio-ADM level at index of diagnosis did not correlate with PAH non-invasive and invasive hemodynamics parameters. Lower plasma bio-ADM tended to associate with milder PAH severity and lower PAH risk stratification.

Keywords: adrenomedullin, bio-ADM, risk stratification, pulmonary arterial hypertension, ASD-PAH

2. The Bio-ADM (pg/mL) level between ASD-PAH and Primary PH

Bio-ADM, pg/mL	All subjects (n = 100)	ASD-PAH (n = 85)	Primary PH (n = 15)	<i>p</i> -value
Mean \pm SD	11.6 \pm 13.1	10.5 \pm 12.8	17.64 \pm 15.5	0.005*
Median (IQR)	7.95 (10.0)	7.3 (9.4)	15.5 (16.6)	

Continuous data was expressed as mean \pm SD, categorical data was presented as numbers, IQR: Interquartile range

The Bio-ADM (pg/mL) level between ASD-PAH and Primary PH

BLOOD GLUCOSE AND SERUM CREATININE ASSOCIATION WITH PERCUTANEOUS CORONARY INTERVENTION (PCI) CLINICAL OUTCOMES

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RSUD Dr. Soedarso Pontianak¹

Background and Aims

Percutaneous coronary intervention (PCI) is a non-surgical procedure to open the occlusion of coronary artery by ballooning the narrow segment or deploying a stent to improve blood supply. Hyperglycaemia and decreased renal function are common in coronary artery disease (CAD) patients who will undergo PCI procedure. The study was aimed to identify the relationship between pre-PCI blood glucose and pre-PCI serum creatinine to PCI clinical outcomes.

Materials and Methods

A cohort, analytical observational study was performed of 30 patients diagnosed with CAD who underwent PCI procedure in RSUD Dr. Soedarso Pontianak from January 2020 to January 2022. Data on clinical and laboratory results like pre-PCI blood glucose and pre-PCI serum creatinine data were collected. The primary endpoint was clinical outcome of PCI such as mortality, rehospitalization, acute myocardial infarction in 1 year, and shortness of breath.

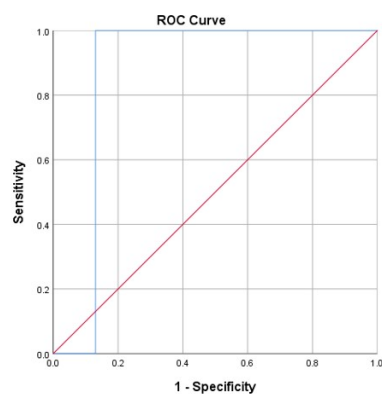
Results

Thirty CAD patients underwent PCI, 80% had pre-PCI blood glucose >200 mg/dL and 36% had pre-PCI serum creatinine >1.2 mg/dL. Using Chi Square to identify the relation between pre-PCI blood glucose and pre-PCI serum creatinine to PCI clinical outcome in one year. Pre-PCI blood glucose is related to rehospitalization rate ($p = 0.022$). Pre-PCI serum creatinine is related to shortness of breath in 1 year ($p = 0,009$). Pre-PCI blood glucose is not related to myocardial infarction, shortness of breath, and mortality with p value > 0.05 . Pre-PCI serum creatinine is not related to rehospitalization rate, myocardial infarction, and mortality with p value > 0.05 .

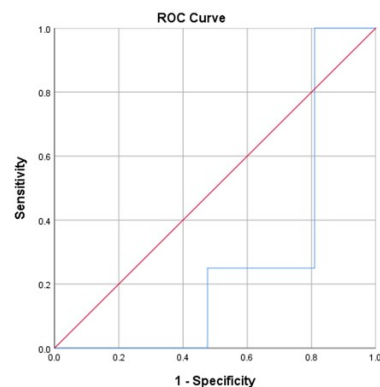
Conclusion

CAD patients who underwent PCI, with high blood glucose had higher rehospitalization rate and with high serum creatinine had higher rate of shortness of breath.

Keywords: PCI, Blood Glucose, Serum Creatinine



ROC Curve of Pre-PCI Blood
Glucose and Rehospitalization Rate



ROC Curve of Pre-PCI Serum
Creatinine and Event of Shortness of
Breath

Receiver Operating Characteristic (ROC) Curve shows association between blood glucose and serum creatinine with PCI clinical outcome

Senescence as a Potential Therapeutic Target for Age-related Cardiac Dysfunction

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Center for Life, Newcastle Upon Tyne²
Center for Ageing, Newcastle Upon Tyne³

Background and Aim

Heart failure (HF) is a progressive disease caused by structural abnormalities resulting in the inability of the heart to meet the body's metabolic demands. Advanced age is a significant risk factor for the development of HF. With age, there is an increase in cardiomyocyte hypertrophy and fibrosis. This detrimentally impacts left ventricle function and progressively results in diastolic HF. Cellular senescence leads to permanent cellular replicative arrest and phenotypic changes including cellular hypertrophy and development of the senescence-associated secretory phenotype. Senescence is associated with age-related tissue dysfunction in several organs. In the heart, we previously demonstrated that cardiomyocyte senescence accumulates with age and is directly associated with cardiomyocyte hypertrophy and the expression of pro-fibrotic factors. We hypothesise that senescence contributes to age related HF and that clearance of senescent cells will improve cardiac morphology and function.

Materials and Methods

Magnetic resonance imaging analysis and histological techniques were conducted to observe cardiac morphology and function.

Result

In this study we demonstrate that aged mice have a clinically relevant cardiac dysfunction, associated with an increase in hypertrophy and fibrosis. Furthermore, the senolytic compound, Navitoclax, induces apoptosis in senescent but not proliferative cardiomyoblasts and fibroblasts *in vitro*. Navitoclax has the potential to improve cardiac function in terms of ejection fraction, and treatment leads to a reduction in cardiomyocyte hypertrophy and a decrease in fibrosis at the histological level in aged mice.

Conclusion

Overall, our data indicate senescence may have a detrimental effect on heart function associated with age, and clearance may be of therapeutic benefit.

Keywords: Senescence, Heart Failure, Navitoclax, Cardiac function

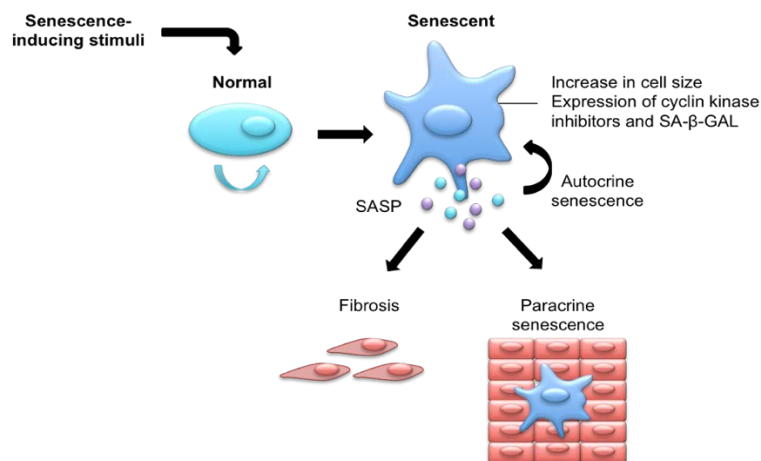
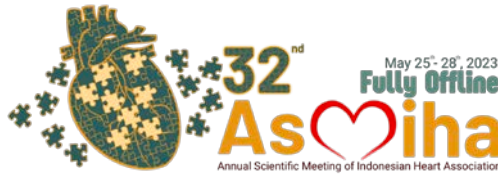


Figure 1. Cells that become senescent develop a "senescent phenotype".



Optimization of Arterial Stents for May-Thurner Syndrome Management in West Java : Experience and Outcome

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Faculty of Medicine, Bandung Islamic University; Al Ihsan General Hospital, West Java Province²

Background and Aim

May-Thurner Syndrome (MTS) is an anatomical defect where the right common iliac artery overrides and compresses the left iliofemoral vein. MTS causes Deep Vein Thrombosis (DVT) but is often underdiagnosed. As anticoagulant management (warfarin) rarely achieves target INR, endovascular management is vital for MTS. The latter is generally facilitated using a venous stent. However, the unavailability of the venous stent in Indonesia made arterial stent be optimized during vein stenting procedure. We aim to report our experience.

Materials and Methods

We did a consecutive observational study within 26 months in a hospital in West Java including 8 MTS patients. Diagnosis established by the finding of proximal femoral DVT by ultrasonography further confirmed by CT angiography. Endovascular management was done using an arterial stent. After endovascular management, we reviewed the outcome on a follow-up including stent fracture, in-stent-restenosis (ISR), and stent patency. These are also monitored by serial imaging by CT Angiography, with periods ranging from 2 to 10 months (mean: 7 months). Direct oral anticoagulants (DOAC) and antiplatelets are usually given along with compression stockings following the procedure.

Result

No stent fracture, no ISR, and the stent remained patent after follow-up. Clinical symptoms resolved with no occurrence. No patient had complications.

Conclusion

Apart from the difference in radial power compared to the venous stent, the arterial stent is feasible to use during MTS endovascular management with good postprocedural results. Prompt management is needed to prevent complication and chronic total occlusion. Comprehensive management should be ensured to optimize patients' quality of life. We do hope that venous stent would be available in the future.

Keywords: Arterial stent, Deep venous thrombosis, May-Thurner Syndrome

Cardiotoxicity Risk Profile in Chemotherapy Breast Cancer Patients: A Single-center Study

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Background and Aim

Breast cancer patients are at an increased risk for cardiovascular disease (CVD) consequent to cancer treatment. This study aimed to describe the characteristics of breast cancer patients with pre-existing CVD risks and of those diagnosed with cancer therapy-related cardiac dysfunction (CTRCD) after receiving chemotherapy.

Materials & Methods

This descriptive study was conducted from June 2022 to February 2023 in the Department of Cardiology and Vascular Medicine, Hasan Sadikin General Hospital. Established breast cancer patients were recruited. The patients were interviewed regarding CV risk factors, then followed up by echocardiography examination. Cardiotoxicity risk stratification was determined using ESC guidelines. CTRCD was defined as a new reduction in LVEF >10% from baseline or LVEF <50%.

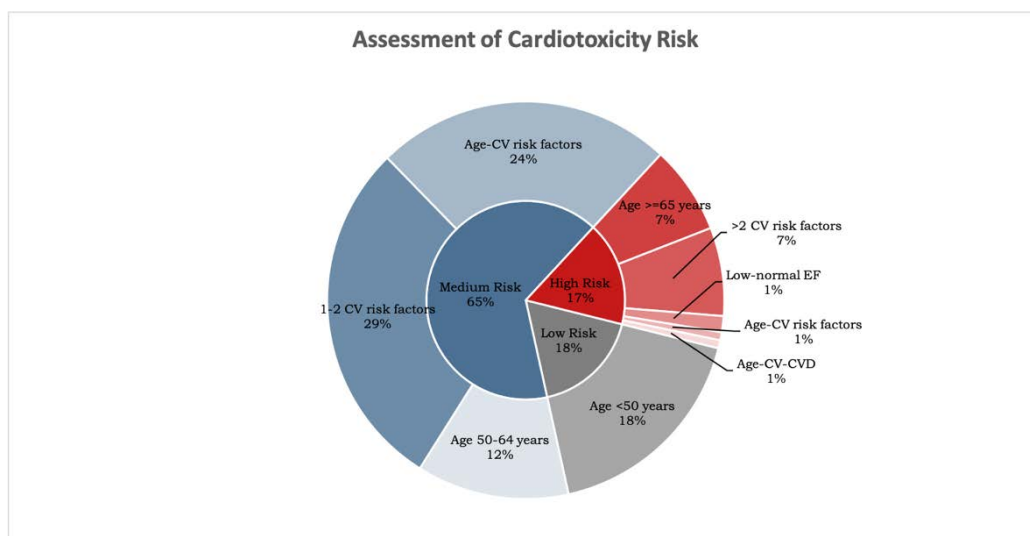
Results

A total of 153 breast cancer patients (mean age 50.4±9.7) were included, and 56.2% were receiving neoadjuvant therapy. Of the cases, 29.4% had hypertension, 8.5% had DM, 7.2% had dyslipidemia, 12.4% were ex-smoker, and 8.5% had a family history of premature CVD. Only one patient has an underlying CV disease. Based on baseline echocardiography, only 2 patients (1.3%) have low normal EF (50-54%), whilst 77.8% were having normal LVEF. However, 26 patients (17%) were categorized as high-risk for cardiotoxicity, while 17.6% and 65.4% were categorized as low and medium risk, respectively. Furthermore, despite normal baseline LVEF, 2 medium-risk patients and one high-risk patient have been classified into CTRCD. Thus, the prevalence of cardiotoxicity in breast cancer patients was 1.96%. The time span from the first chemotherapy to CTRCD occurrence varied from 30 months, 10 months, and 2 months.

Conclusions

This study showed that the majority of breast cancer patients were categorized as a medium risk for cardiotoxicity. Therefore, it is important to focus on risk stratification before chemotherapy and do routine monitoring of breast cancer patients' cardiac function, to maintain optimal health status.

Keywords: Cardiotoxicity, Breast Cancer, Chemotherapy-induced, Cancer-therapy related cardiac dysfunction



Cardiotoxicity risk stratification profile in chemotherapy breast cancer patients in Hasan Sadikin General Hospital from June 2022 to February 2023



Anti-atherosclerotic Indonesian Sambal Lalapan Fermentation Extract Reduces Oxidative Stress in Atherosclerotic-Model Male New Zealand White (NZW) Rabbit – A Possible Novel Supportive Cardiovascular Disease Prevention and Control Management

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Background and Aim:

Many vessel diseases impair and maim globally due to oxidative stress-induced atherosclerosis. Studies of *sambal lalapan*, a daily Indonesian traditional dish with antioxidant-rich mixed veggies and spices, remain obscure. This work examines the antiatherogenic effect, antioxidative physicochemical profile, and cytotoxicity of *sambal lalapan* fermentation (SLF) extract.

Material and Methods:

Before ethanol extraction, SLF fermented for 7, 14, and 21 days. Microbiome profiling, metabolite characteristics, pH, organoleptic, antioxidants (polyphenol, flavonoid, and DPPH (2,2-diphenyl-2-picrylhydrazyl) test), and cytotoxic activity were determined. Twenty two-month-old male atherosclerotic-model NZW rabbits were divided into: 1) standard diet; 2) HFD; 3) HFD and 100 mg/kg BW/day SLF extract; 4) HFD and 200 mg/kg BW/day SLF extract. *In vivo* TC and LDL-c serum levels were measured. Colorimetric assay were used to analyze MDA and SOD, while molecular docking was used to determine its metabolic interaction with atherogenic compounds. Statistical analysis was performed in SPSS version 24.

Results:

The 14th (pH 3.7 ± 0.06) and 21st days (pH 3.4 ± 0.04) were optimal for pH reduction. Organoleptic data favoured the control group after 7 days of brewing. The extract had 70 pathogen-free microbe types out of 1,011. LC-MS/MS detected peptides, fatty acids, polysaccharides, nucleosides, flavonoids, flavanols, and phenolic compounds. Metabolites and scavenger receptors (SR) had higher negative binding affinity than simvastatin in the docking study. SLF showed athero-protective effect. Fermentation group MDA was higher than SOD (p<0.05). DPPH, flavonoid content, and polyphenol were highest on the 21st (1.13±0.7%), 14th (0.08±2.0%), and 7th (0.94±0.1%) days, respectively. SLF extract dose-dependently lowered TC (100, 200 mg/kg BW SLF: 269.96±85.34; 130.17±45.02 mg/dL) and LDL-c (100, 200 mg/kg BW SLF: 87.24±22.85; 41.82±11.08 mg/dL) (p<0,001). Cytotoxicity test showed a very high dosage limit, toxic at 2,000 µg/ml.

Conclusion:

The SLF extract exerts high antioxidant activity and excellent anti-atherosclerotic effects, with low cytotoxic effects and low pathogenic bacteria.

Keywords: Atherosclerosis, Oxidative Stress, Fermentation, Antioxidant, Organoleptic

Keywords:



Clinical Characteristics of Multivalve Lesion in Rheumatic Heart Disease: a Single Centre Registry at Dr. M. Djamil Hospital

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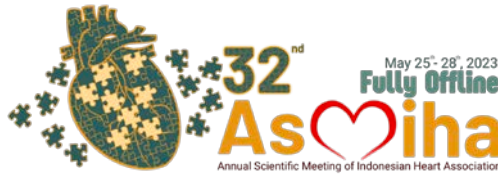
Background and aims: Multiple valvular heart disease is high in rheumatic heart disease, especially in developing countries. Characteristics of multiple valvular diseases in rheumatic heart disease were important in planning optimal treatment strategies to relieve the burden of RHD. This study aimed to describe the clinical and echocardiography profile of patient with multivalve lesion in RHD.

Materials and Methods: This retrospective study was performed between 2019-2022 at General Hospital of Dr. M. Djamil Padang. All data were taken from medical records at Dr. M. Djamil Hospital. The technique of sampling was done with total sampling and all samples were analyzed using Statistical Package for the Social Sciences (SPSS) software.

Results: The population and sample of this study were 185 patients. The result of this study showed that majority of the patients were female (73%), mean age was $42,78 \pm 12,59$ years old, mostly found with normal BMI (42,6%). Atrial fibrillation (AF) was the most frequent rhythm disorder in RHD (80,5 %). Mitral stenosis was the most common valve lesion in RHD (81%) with severe MS being 64,3%. This study showed the most common multivalve disease was mitral stenosis with the concomitant disease mitral regurgitation (31,4%) and aortic regurgitation (23,5%). The most common valve lesion with triple valve lesion is MR, MS and AR in 19 patients (10,3%). The mean EF in this study was $56\% \pm 7,8$, mean TAPSE was $1,9 \pm 0,6$, Most patients with RHD had preserved left ventricular (LV) ejection fraction (88,5%). A quarter of the patients with mitral stenosis had reduced right ventricular (RV) contractility (28,4%).

Conclusion: Mitral stenosis was the most condition of valve lesion in RHD with concomitant mitral regurgitation. Characteristics of RHD patients in this study were predominantly female, younger age, had preserved LV function, normal RV function, and high prevalence of AF.

Keywords: multivalve lesion, rheumatic heart disease, echocardiography



Study on Association Between Coronary Artery Lesions and Risk Factors in Patients Underwent Percutaneous Coronary Intervention at Gatot Soebroto Central Army Hospital Jakarta

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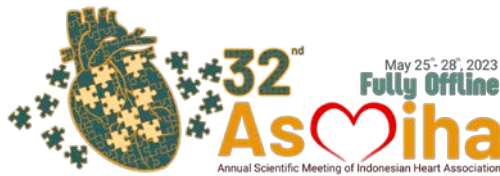
Background and aims: Percutaneous coronary intervention (PCI) is a non-surgical, minimal-invasive procedure that may be required in several patients with coronary artery disease (CAD). This study aimed to assess the correlation between the number of coronary artery lesions, obtained from PCI procedures, and both non-modifiable (i.e. age, gender) and modifiable (i.e. hypertension, obesity, lipid levels, and diabetes mellitus) risk factors.

Materials and methods: Retrospective method was used involving 236 patients who underwent PCI and were treated at RSPAD Gatot Soebroto from December 2020 to December 2021. According to coronary artery lesions, patients were classified into single-vessel lesion group and multi-vessel lesion group (the number of lesion vessels ≥ 2). The single-vessel group included 115 patients, and the multi-vessel group included 121 patients. Later association analysis was carried out.

Results: A total of 236 reports were analyzed. The patients were predominantly male (82,6%), with the average age of 60,28 years old, and 50,4% of patients were geriatric. We found that hypertension is the major risk factor that contributes to CAD (62,7%), followed by obesity (60,2%), diabetes mellitus (31,4%), and dyslipidemia (19,5%). Our analysis showed there were statistically significant association ($P < 0,05$) between gender, obesity, diabetes mellitus, and dyslipidemia with a greater number of coronary stenosis lesions. In addition, approximately 57,7% obesity patients, 62,2% diabetes mellitus patients and 86,9% dyslipidemia patients had multi-vessel lesion indicating a significant association ($P < 0,05$) between those modifiable risk factors and number of coronary artery lesion. However, our study showed both hypertension and age had no statistically significant association ($P > 0,05$).

Conclusion: These studies strengthen the existing theory that the number of coronary artery lesions is significantly associated with patient risk factors such as gender, obesity, diabetes mellitus, and dyslipidemia. Lifestyle modification especially to control the modifiable risk factors are important.

Keywords: Risk Factors, Coronary Artery Lesions, Percutaneous Coronary Intervention



Modified Euro-TAPSE-score as A Better Predictor of In-Hospital Mortality for Valvular Heart Surgery in Indonesia

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Background and Aim: European System for Cardiac Operation Risk Evaluation (EuroSCORE) II has externally been validated in Indonesia with low calibration and medium discriminatory ability to predict in-hospital mortality in valvular heart surgery (VHS). This study was conducted to develop a better scoring system using each variable in EuroSCORE II and Tricuspid Annular Systolic Plane Excursion (TAPSE) as an add-on to increase its predictive value.

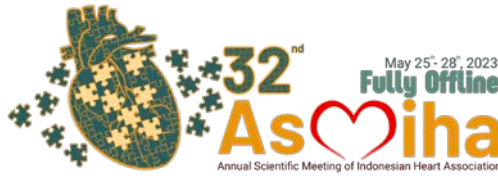
Material and Methods: A retrospective single-centre study was conducted involving 1842 patients underwent any type of VHS from 2018-2021. Multivariate analysis was performed with logistic regression. Cut-off value was decided based on the best possible combination of sensitivity and specificity for predicting in-hospital mortality.

Results: The overall in-hospital mortality was 9,0% with the highest cause of mortality was cardiac death (65%) followed by infection (16%). EuroSCORE II has poor calibration (Hosmer-Lemeshow $p=0,028$; predicted mortality 2,56%) and low discriminatory ability [AUC 0,686 (95% CI 0,644 – 0,728), $p<0,001$] in this study. Multivariate analysis showed TAPSE < 17 mm, age > 60 years, creatinine clearance level, poor mobility, NYHA class, previous cardiac surgery, recent myocardial infarction (within 90 days), urgent or emergent procedure were independent predictors of in-hospital mortality. Modified Euro-TAPSE-Score using these variables had maximum values of 101. Patients whose score ≥ 16 had higher risk of in-hospital mortality. This scoring system had better calibration (Hosmer-Lemeshow $p=0.615$) and higher discriminatory ability (AUC 0.727 (95% CI 0.686-0.768), $p<0.001$) with than EuroSCORE II with sensitivity and specificity of 66,5% respectively.

Conclusions: Modified Euro-TAPSE-Score has better predictive value than EuroSCORE II and is easier to use for predicting in-hospital mortality for VHS especially in developing countries.

Keywords: EuroSCORE II, TAPSE, Valvular Heart Surgery, Modified Scoring System

Modified Euro-TAPSE-Score		
Variable		Point
Age > 60 years		8
Creatinine clearance (ml/minutes)	>85	0
	50 – 85	2
	<50	6
	On dialysis	23
Poor mobility		12
NYHA classification	NYHA 1	0
	NYHA 2	4
	NYHA 3	7
	NYHA 4	9
Previous cardiac surgery	Yes	18
Recent myocardial infarct ≤ 90 days	Yes	6
Urgency status	Elective	0
	Urgent / Emergent	9
Weight of procedure	1 procedure	0
	2 procedures	4
	≥ 3 procedures	13
TAPSE < 17 mm	Yes	3
Maximum Score		101
Cut-Off		≥ 16



Right Heart Failure as a Prognostic Factor for 1 year Survival after Triple Valve Surgery in Rheumatic Heart Disease

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BACKGROUND AND AIMS

Complex pathophysiological interplay in multivalvular disease (MVD) lead to ventricular remodeling and pulmonary hypertension. Pulmonary hypertension (PH) is a complication of long-standing valvular disease, especially in complex valvular lesion. Symptomatic right heart failure (RHF) is a maladaptive stage of disease, have a prognostic impact on survival rate after triple valve surgery (TVS).

MATERIALS AND METHOD

Rheumatic MVD who underwent the TVS procedure at our centre, between January 2012 and December 2018. We retrospectively followed the patient after hospital discharge until a year follow up. The outcome was all-cause mortality during a year follow up. Age, sex, preoperative RHF, heart failure NYHA functional class, atrial fibrillation, serum creatinine, and body surface area (BSA) are included in clinical variables. TAPSE/PASP ratio value below 0.36 was used as the surrogate marker of RV-PA uncoupling. Kaplan-Meier survival curve used to analyse overall survival and Mantel-cox to compared survival between associated factor. Cox regression analysis was used to analyse multivariate data to model the relationship between those variables that were had p value < 0.25 from bivariate analysis.

RESULT

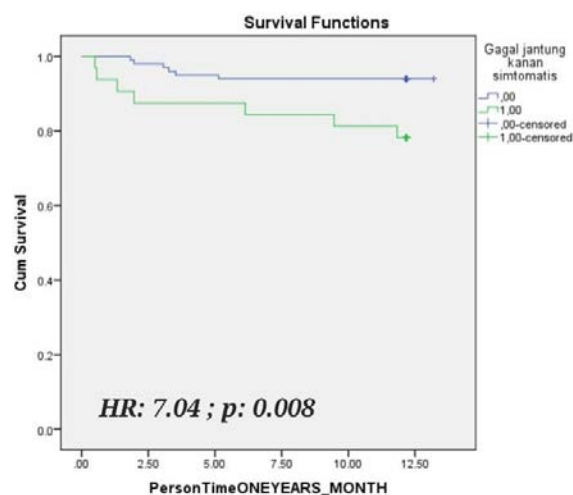
In 131 patients underwent TVS procedure from 2012 until 2018. Thirteen patients died during one year followed up after hospital discharge. One-year overall survival were 90.1 %. Using bivariate analysis Mantel-cox, preoperative RHF was significantly have lower one year survival rate. Preoperative RHF was associated with higher outcome in one year follow-up (HR 7.04, $p = 0.008$).

In multivariate cox regression analysis, preoperative RHF remained significant as an independent predictors associated with lower one years survival (HR 3.6, 95 % CI 1.2 – 11, $p = 0.021$). Factors that associated with one year survival provided in Table 1

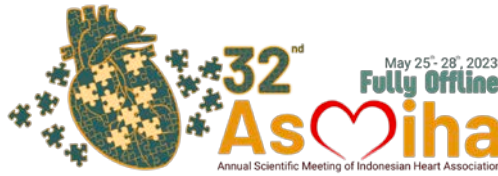
CONCLUSION

Preoperative RHF associated with worse one year survival rate after TVS compared to without RHF.

Keywords: right heart failure, rheumatic heart disease, multivalvular disease, triple valve surgery



Cumulative One Year Survival after Triple Valve Surgery in Preoperative Right Heart Failure Symptom



Cardiological Scoring System as Predictors of Mortality in Hypertensive COVID-19 Patients

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Background and aims:

COVID-19 patients with hypertension are at higher risk for complications and have higher mortality rate. With significant vulnerability to COVID-19, a comprehensive approach is needed to enhance the survival rate. Rapid scoring can be important to determine the prognosis of COVID-19. Therefore, we developed a scoring system to predict mortality to facilitate coordinated care planning.

Materials and Methods:

This study included 406 data confirmed COVID-19 with hypertension from referral hospital in East Java. Electrocardiography (ECG), laboratory analysis and chest x-ray (CXR) findings are examined to develop scoring system to predict mortality.

Results:

After multivariable adjustment and stepwise elimination, seven of 13 variables: cardiomegaly ($p = 0.036$), sinus tachycardia ($p = 0.001$), ST-segment abnormalities ($p = 0.036$), right bundle branch block ($p = 0.008$), left bundle branch block ($p = 0.046$), left ventricle hypertrophy ($p = 0,023$), and creatinine ($p = 0.000$) were retained and compared. Each variable has a different risk score and is used to classify the patients into risk groups: low risk (0-2 points), moderate risk (3-6 points), and high risk (≥ 7 points), determined by calculating the sum of the risk in the scoring system. ROC curve analysis of the ability of the scoring system to predict mortality showed an area under the curve (AUC) of 75,8% (confidence interval: 95%), a cutoff point of $\leq 1,5$ with a sensitivity of 76,3% and specificity of 62,1%.

Conclusion:

We concluded that the final model has the potential to predict mortality in hypertensive COVID-19 patients during hospital admission. The mortality rate is therefore expected to regress following risk group determination using our scoring model, which would yield a more comprehensive treatment plan.

Keywords:

COVID-19, Hypertension, Electrocardiogram, Chest X-Ray, Creatinine

Keywords: COVID-19, Hypertension, Electrocardiogram, Chest X-Ray, Creatinine

Table 1. Cardiac Scoring Model to Predict Mortality in Hypertensive COVID-19 Patients.

CHARACTERISTIC	POINTS
CARDIOMEGALY	1
SINUS TACHYCARDIA	1
ST ABNORMALITIES	1
RBBB	2
LBBB	3
LVH	1
CREATININE	2

Table 2. Scoring Model to Predict Mortality in Hypertensive COVID-19 Patients.

Recommendation	Total Score
Low Risk	0-2 points
Moderate Risk	3-6 points
High Risk	≥ 7 points

Scoring model to predict mortality in hypertensive COVID-19 patients

The Relationship Between Regulatory T-Cells and Essential Hypertension

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Background and Aim: Immune system has currently been postulated to have a role in hypertension, with regulatory T cells being protective against hypertension in animal studies. This study aims to seek the relationship between regulatory T cells and hypertension in humans.

Materials and Methods: This case-control study was held at PJNHK and RSUI from August to December 2022. Subjects with essential hypertension and normotension who visited the outpatient clinic were included. Evaluations were done using home blood pressure monitoring and blood sampling to see the levels of regulatory T cells using flow cytometry.

Results: Subjects consisted of 80 subjects (40 subjects from the essential hypertension group and 40 subjects from the normotensive group). The results showed a significant difference between the levels of regulatory T cells in subjects with essential hypertension compared to normotension, in which the levels of regulatory T cells were lower in the essential hypertension group ($p < 0.0001$). The correlation test showed a strong correlation between regulatory T cells and systolic blood pressure ($r = -0.733$, $p < 0.0001$) and diastolic blood pressure ($r = -0.613$, $p < 0.0001$). A multivariate test showed that regulatory T cells were protective against hypertension with $OR = 0.81$ ($CI = 0.71-0.91$, $p < 0.0001$).

Conclusions: There is a relationship between regulatory T-cell levels and the subject's hypertensive status. Regulatory T cell levels were lower in subjects with essential hypertension compared to normotension subjects.

Keywords: Regulatory T Cells, Essential Hypertension, Immune system

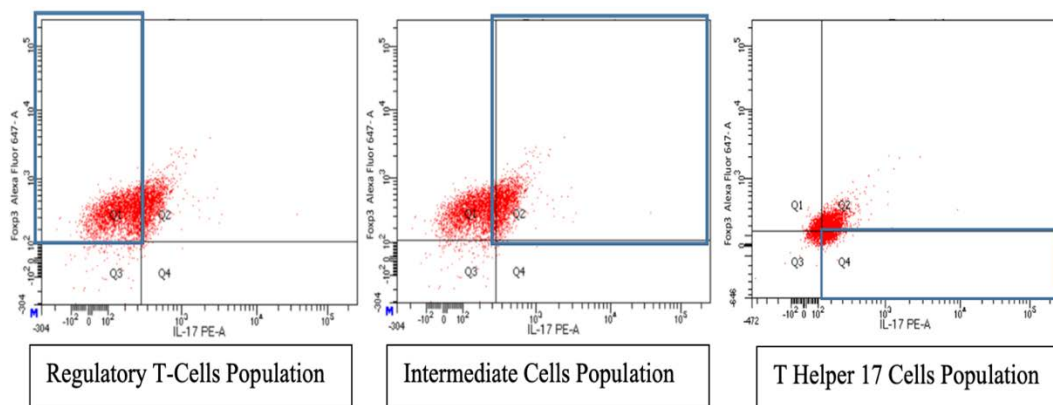
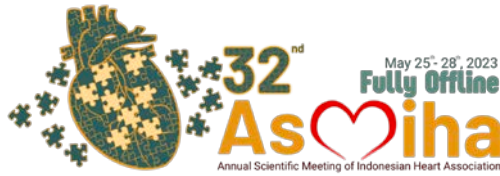


Figure 1. Flow cytometry Results



Comparison of Wilkins Score and Cormier Score to Predict Outcomes of Mitral Stenosis Patients Undergoing Percutaneous Transmitral Commissurotomy

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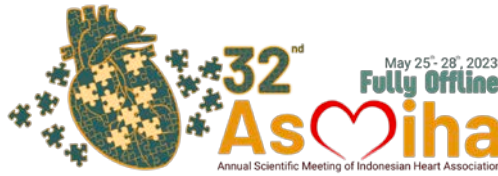
Background and Aim: Until now, there have been many studies that propose a better scoring system to evaluate Percutaneous Transmitral Commissurotomy (PTMC) candidates. However, Wilkins score is an echocardiographic score that still has been used for almost three decades. Cormier score is a newer and simpler scoring alternative to assess PTMC candidates. The aim of this study is to compare Wilkins and Cormier scores in relation to outcome of mitral stenosis (MS) patients undergoing PTMC.

Material and Methods: We conduct is an analytic observational retrospective study of patients with a diagnosis of MS with or without mild mitral regurgitation (MR) who underwent PTMC at Dr. Soetomo Hospital Surabaya. Data were taken from the patient's medical record, which included anamnesis, physical examination, and echocardiographic examination both before and after PTMC procedure. We evaluate the PTMC outcomes such as, PTMC successfulness and complications after PTMC procedure.

Results: We enrolled total 31 MS patients under PTMC procedure. PTMC procedure was successful in 25 patients (80.64%) with the average MVA planimetry increasing from 0.82 ± 0.21 cm² to 1.68 ± 0.17 cm² ($p < 0.001$) and MV gradient decreased from 17.53 ± 6.21 mmHg to 6.07 ± 2.08 mmHg ($p < 0.001$). Significant MR (Seller's criteria > 1) was found in 4 patients. From the ROC curve, it shown that Cormier score was better at predicting PTMC successful outcome (AUC 0.857 vs 0.723). However, Wilkin and Cormier score has similar ability to predict MR complication after PTMC procedure (AUC 0.699 vs 0.652).

Conclusion: Cormier score is superior to Wilkins score in predicting the outcome of PTMC for MS patients. Wilkins score and Cormier score do not adequately predict the prognosis of MR complication following PTMC procedure.

Keywords: mitral stenosis, percutaneous transmitral commissurotomy, wilkins score, cormier score



Correlation between the Triglyceride Glucose Index and Severity of Coronary Artery Disease in ST-Elevation Myocardial Infarction Patients in Kariadi Central General Hospital

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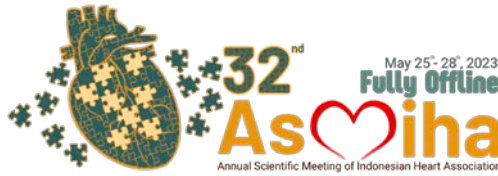
Background and aims: Cardiovascular disease (CVD) is still among the leading causes of morbidity and mortality. Factors that play an important role in CVD such as hyperglycemia and dyslipidemia. The triglyceride glucose (TyG) index is a surrogate marker of insulin resistance that has been reported to be associated with cardiovascular diseases. However, evidence of the impact of the TyG index on the severity of coronary artery disease (CAD) is limited. The aim of the study was to analyze the correlation between the TyG index and severity of CAD in STEMI patients.

Materials and Methods: This study was an observational retrospective cohort study. The data was collected from ICCU Registry of Kariadi Central General Hospital between August 2021 and February 2023. The subject was STEMI patients who underwent angiography with or without intervention. Clinical and laboratory data were collected. The TyG index was calculated by $TyG\ index = \ln(\text{fasting TG (mg/dL)} \times \text{fasting glucose (mg/dL)})/2$. The severity of CAD was determined by angiography. Data analysis was performed using SPSS 26.0.

Result: This study enrolled 116 STEMI patients with significant CAD, divided into groups according to the tertiles of the TyG index as follows: T1 group, TyG index $< 8,42$; T2 group, TyG index $\geq 8,42$ to $< 9,15$; and T3 group, TyG index $\geq 9,15$. The severity of CAD was divided by the number of stenotic vessels as single vessel CAD versus multi-vessel CAD. Comparative test results showed that there were significant differences in TyG index based on CAD severity ($p = 0.021$). Correlation test results showed that there were a positive-weak correlation between TyG index and CAD severity ($r = 0.202$, $p = 0.030$).

Conclusion: There was correlation between the triglyceride glucose index and severity of coronary artery disease in STEMI patients.

Keywords: Triglyceride index, Coronary artery disease, ST-Elevation Myocardial Infarction, Intensive Cardiac Care Unit



Diagnostic Potential of MicroRNA-1, MicroRNA-21 and MicroRNA-29 as Novel Biomarkers for Early Myocardial Fibrosis in Heart Failure with Preserved Ejection Fraction

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Background and Aim:

Currently, there is an unmet need for a minimally invasive with less radiation diagnostic tool for the development of early myocardial fibrosis and targeted treatment for HFpEF. We aimed to investigate the diagnostic potential of circulating microRNAs (miRNAs) for detecting early myocardial fibrosis development in Heart Failure with Preserved Ejection Fraction patients (HFpEF).

Materials and Methods:

This observational study uses a case-control research design. Peripheral blood samples were isolated from 25 HFpEF patients and 25 normal patients and measured for complete laboratory testing, NTproBNP levels using ELISA, MicroRNA-1, 21 and 29 levels using RT-PCR. All patients also underwent Echocardiography and Global Longitudinal Strain to measure the myocardial fibrosis progression. Data were analyzed using SPSS 25.0

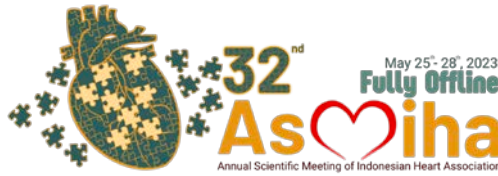
Results:

HFpEF patients have significantly higher GLS compared to the normal patient ($-13 \pm 2.4\%$ vs $-19 \pm 3.2\%$, $p < 0.05$), suggesting HFpEF patients tend to have myocardial fibrosis. HFpEF patients also have significantly higher MicroRNA-1 and MicroRNA-21 compared to the normal patient ($p < 0.05$), but lower MicroRNA-29 ($p < 0.05$). There is a positive correlation between MicroRNA-1 and MicroRNA-21 with GLS finding ($r = 0.753$, $p < 0.05$; and $r = 0.675$, $p < 0.05$) and an inverse correlation between MicroRNA-29 with GLS finding ($r = -0.653$, $p < 0.05$). By using a GLS cutoff of -15% for myocardial fibrosis, we obtain that MicroRNA-1, MicroRNA-21 and MicroRNA-29 can predict myocardial fibrosis based on GLS with a specificity of 78% and sensitivity of 75%.

Conclusion:

Increasing MicroRNA-1 and MicroRNA-21 followed by decreasing MicroRNA-29 in HFpEF patients suggesting their roles in early myocardial fibrosis. Detection of those biomarkers can be beneficial for early myocardial fibrosis diagnosis, early aggressive HFpEF treatment and targeted miRNA silencing therapy to prevent the worsening of HFpEF.

Keywords: Diagnostic, Global Longitudinal Strain, HFpEF, MicroRNA, Myocardial Fibrosis



ABNORMAL T-WAVE ALTERNANS IN CORONARY ARTERY DISEASE LEFT VENTRICLE EJECTION FRACTION >40% WITH MYOCARDIAL INFARCTION

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Background and aims: Coronary artery disease (CAD) may present with or without myocardial infarction, with the left ventricle ejection fraction (LVEF) <40% or >40%. Myocardial infarction with LVEF <40% has been reported to cause abnormal T-wave alternans (TWA) value. The data about abnormal TWA value in myocardial infarction with LVEF >40% is still limited.

Materials and Methods: A case-control analytic study was held at Dr. Sardjito general hospital Since March 2021 until April 2022 on adult CAD subjects with LVEF >40%. The TWA value was obtained from treadmill test which was then divided into the case group if the TWA value was abnormal and into the control group if the TWA value was normal. The data about myocardial infarction was retrospectively evaluated afterwards. Hypothesis testing was performed by Chi-Square test. Multivariate analysis using logistic regression test was conducted to determine the effect of confounding variables on TWA value.

Results: A total of 124 subjects were included in this study (62 subjects in the case group with abnormal TWA value, and 62 subjects in the control group with normal TWA value) with the mean age of $55,48 \pm 8,6$ years old and 83,8% were male subjects The proportion of subjects with abnormal TWA value with myocardial infarction and without myocardial infarction were 74,6% and 16,7% respectively. The Chi-Square test showed an association between PAH and abnormal TWA with OR 14,395 (CI 95%: 5,88-35,21; $p < 0,001$). After multivariate analysis, myocardial infarction was the only remaining variable independently associated with abnormal TWA values.

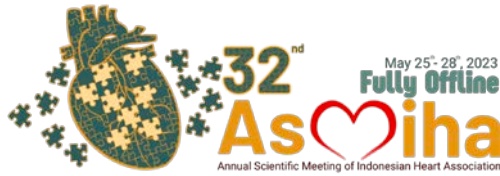
Conclusion: Abnormal TWA value occurred more frequently in subjects with myocardial infarction compared to subjects without myocardial infarction, in population of CAD LVEF >40%, with the possibility of 14,395 times more frequent.

Keywords: t-wave alternans, coronary artery disease, myocardial infarction

TWA value and myocardial infarction

	Abnormal TWA	Normal TWA	Total	OR (CI 95%)
With Myocardial Infarction	53 (74,6%)	18 (25,4%)	71	14,395
Without Myocardial Infarction	9 (16,9%)	44 (83,1%)	53	(5,88-35,21)
Total	62 (50,0%)	62 (50%)	124	$p < 0,001$

TWA, T-wave alternans



EARLY PHASE II REHABILITATION POST PCI, OBSERVATIONAL DATA FROM RSSA

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Background and Aim: Cardiac rehabilitation (CR) is beneficial for patient after doing percutaneous coronary intervention (PCI). Early cardiac rehabilitation is occasionally avoided after acute myocardial infarction (AMI) because of exercise-induced ischemia. Cardiac rehabilitation has mainly been initiated 1 week after the onset of AMI with training phase (phase II) of post-MI cardiac rehabilitation after 2-4 weeks. We evaluate the possibility of doing phase II CR with earlier time less than 1 week post PCI.

Materials and Methods: Our observational data from rehabilitation registry August 2022 – March 2023 at RSSA on patient doing phase II CR \leq 1 week post PCI.

Result: From our data we found 23 patient (Male 20, Female 3) doing phase II CR 1 week or less post PCI. Mean age of patient was 57 years with CAD3VD (74%), CAD2VD (13%), and CAD1VD (13%). The mean days from post PCI to phase II CR was 5,3 days, with the earliest was 3 days post PCI. Three patient (13%) had complain (tiredness, discomfort in hand, and shortness of breath) with the worst complain happen in patient with 3 days post PCI (shortness of breath).

Conclusion: Cardiac rehabilitation after PCI might be started earlier \leq 1 weeks, but need to be aware in $<$ 4 days post PCI for probability of serious adverse event. Further research is needed to find saver time to start phase II CR in post PCI patient.

Keywords: Phase II cardiac rehabilitation, Post PCI

Variable	
Age	57
Male/Female	20/3
Mean Day	5,3
Max Day	7
Min Day	3
CAD3VD	74%
CAD2VD	13%
CAD1VD	13%
TOTAL COMPLAIN (Shortness of breath, tiredness, discomfort in hand)	13%



Outcome of in-Hospital Mortality in Non-ST-Segment Elevation Myocardial Infraction Patients Receiving Invasive Strategy Compare with Conservative Therapy in RSUD dr. ISKAK Tulungagung

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RSUD Dr. Iskak Tulungagung¹

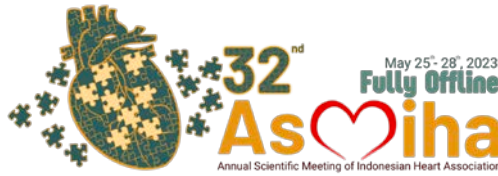
Background and aims: Non-ST-Segment Elevation Myocardial Infraction (NSTEMI) is an acute ischemic event causing irreversible necrosis of heart muscle as known by part of Acute Coronary Syndrome (ACS) spectrum. Therapy according to risk stratification will affect patient outcomes. This study aim to evaluate outcome of invasive strategy in hospital mortality patiens with NSTEMI compare with conservative therapy of RSUD Dr Iskak Tulungagung.

Materials and Methods: This was an observational case control study of 127 patients admitted to RSUD dr. ISKAK Tulungagung with NSTEMI between August 2020 – July 2021. Sample characteristics were associated with the incidence of in-hospital mortality. Data was analyzed by chi-square and logistic regression.

Results: The result of our analysis show that patients NSTEMI which receiving only conservative therapy increasing mortality than invasive strategy [OR=5.3, 95% CI 1.87-15.4, P<0.001]. Killip class II-IV [OR=3.1, 95% CI 1.25-7.7, P=0.01], haemoglobin [OR= 1.19, P=0.003] and white blood cells [OR=1.2, P=0.00] value, risk stratification in NSTEMI patients [OR=3.1, P=0.01], treatment without ACE-I [OR=2.89, 95% CI 1.1-7.5, P=0.017] and BB [OR=4.6, 95% CI 1.29-16.5, P=0.018], also found to be associated with in-Hospital mortality of NSTEMI patients in RSUD Dr. Iskak Tulungagung.

Conclusions: An Invasive strategy may be associated with lowering in-hospital mortality compared with conservative therapy on NSTEMI patients in RSUD dr. ISKAK Tulungagung.

Keywords: NSTEMI, invasive strategy, conservative therapy, in-Hospital mortality



NT PRO BNP LEVELS AND PROGNOSIS IN CHD : A COMPARATIVE STUDY OF ASD, VSD AND PDA PATIENTS

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Background and Aim Atrial septal defect (ASD), ventricular septal defect (VSD), and patent ductus arteriosus (PDA) are congenital heart diseases that result in volume overload. However, their pathophysiology differs significantly. This study aimed to evaluate the difference in NT-proBNP levels in patients with ASD, VSD, and PDA.

Material and Methods The study used a retrospective cross-sectional design on adult patients diagnosed with ASD, VSD, or PDA confirmed by echocardiography examination and NT-proBNP levels measured at the first visit.

Results

A total of 519 subjects, 465 subjects in ASD group, 41 subjects in VSD group and 13 subjects in PDA group were included in this study. The mean age of ASD group was $36,45 \pm 13,27$, VSD group was $27,07 \pm 12,42$ and PDA group was $30,58 \pm 11,93$. All patients enrolled in ASD group were females 81,3% (n=370) and 18,7% (n=85) were males, in VSD group 50% were females (n=20), and 50% were males (n=20). In PDA group were 91,7% (n=11) females and 8,3% were males (n=1). The study found that the NT-proBNP levels differed significantly among CHD types, with the highest median value found in ASD patients (292,6 pg/ml), followed by PDA (353,5 pg/ml), and the lowest value in VSD patients (52,8 pg/ml) with $p=0,001$. A total of 34 patients (6.6%) died during the study period, there was a significant difference in the NTproBNP levels between patients who died and those who survived, with the former having higher levels (8513 pg/mL) than the latter (239.1 pg/mL). Finally, there was a negative correlation between TAPSE and NTproBNP levels ($r=-0.433$, $p=0.001$).

Conclusion This study suggests that NT-proBNP levels are related to CHD types, outcomes, and TAPSE values in CHD patients. These findings may help understand the differences in pathophysiology and prognosis between ASD, VSD, and PDA, providing a basis for developing more appropriate management strategies.

Keywords: congenital heart disease, pulmonary hypertension, atrial septal defect, ventricle septal defect, NT pro BNP

Perbedaan angka NTproBNP antara jenis PJB

		Hasil NT Pro BNP (pg/mL)			ASD vs VSD	ASD vs PDA	VSD vs PDA
		n	Median (IQR)	p	p	p	p
PJB	ASD	696	292.6 (120.5-1304)				
	VSD	65	52.8 (5-43202)	<0,001* ^s	<0,001* [#]	0,108	0,140
	PDA	29	253.5 (48.8-510.3)				

*) bermakna $p < 0,05$, ^s) Kruskal Wallis, [#]) Mann Whitney

Median NTproBNP tertinggi pada ASD 292.6 diikuti PDA 253.5 dan terendah pada VSD 52.8 dengan perbedaan bermakna $p=0,001$ dari hasil Uji Kruskal Wallis. Perbandingan antar jenis PJB dengan Uji Mann Whitney diketahui hanya NT Pro BNP antara ASD dan VSD yang berbeda bermakna $p < 0,001$, sedangkan NT Pro BNP antara ASD dan PDA tidak bermakna $p=0,108$ serta antara VSD dan PDA juga tidak bermakna $p=0,140$.

Correlation Between Serum Chloride and N-terminal Pro-B-type Natriuretic Peptide Level in Acute Decompensated Heart Failure

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Background and Aims: Globally, acute decompensated heart failure (ADHF) had become high burden due to its morbidity and mortality. Laboratory test that had been recommended to assess the prognosis is N-terminal pro-B-type natriuretic peptide (NT-proBNP), but it was limited and expensive, especially in Indonesia. The other laboratory test was serum chloride, an electrolyte that had a role in body fluid regulation. Some studies had revealed association between lower serum chloride with higher NT-proBNP and poorer prognosis. The aim of this study was to analyze correlation between serum chloride and NT-proBNP in ADHF.

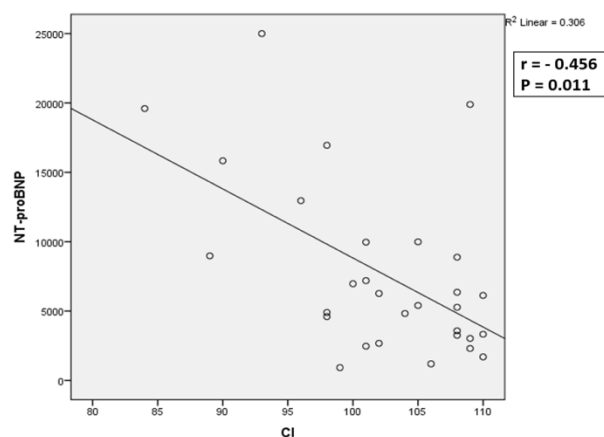
Material and Methods: This study was a cross-sectional that conducted at M. Djamil Hospital from August 2022 to November 2023. All patients who hospitalized in cardiac center with ADHF, left ventricle ejection fraction <50%, and agreed to join with this study were included. We excluded patients with >75 years of age, non-cardiogenic shock, atrial fibrillation, tachycardia ≥ 120 beat-per-minute, ischemic or hemorrhagic stroke, renal failure (estimated glomerular filtration rate <30 mL/min/1.73 m²), sepsis, and body mass index ≥ 40 kg/m². All patients underwent a laboratory test on admission to assess serum chloride and NT-proBNP level. The correlation of serum chloride and NT-proBNP level was assessed using the Spearman correlation test.

Result: The research subjects were 30 patients with ADHF, 25 men and 5 women, the median age was 60.5 (20 – 74) years old. The median level of serum chloride and NT-proBNP were 103 (84 – 110) mmol/L and 5765.5 (922 – 25000) pg/mL, respectively. Based on Spearman correlation test, it was found that serum chloride had a moderate negative correlation with NT-proBNP ($r = -0.456$, $p = 0.011$).

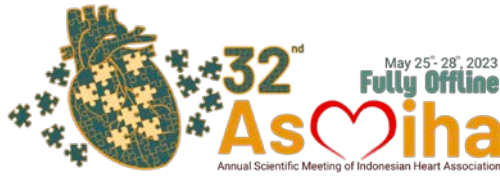
Conclusion: There was a moderate negative correlation between serum chloride and NT-proBNP level in ADHF.

Keywords: acute decompensated heart failure, chloride, NT-proBNP

Keywords: acute decompensated heart failure, chloride, NT-proBNP



Correlation Between Serum Chloride and N-terminal Pro-B-type Natriuretic Peptide Level



**CORRELATION BETWEEN INTEGRATED SCORE OF ST - SEGMENT ELEVATION (ISSTE)
WITH HIGH SENSITIVITY TROPONIN AND CK-MB IN PATIENTS WITH ST-SEGMENT-
ELEVATION-MYOCARDIAL INFARCTION**

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Background and Aim: Coronary heart disease (CHD) is a leading cause of death globally and. One of the types of CHD is STEMI, which is marked with ST elevation in ECG, rising high sensitivity troponin (hsTn) level, and rising creatinine kinase-MB (CK-MB) level. Integrated Score of ST – segment Elevation (ISSTE) is a score that is used to measure ST segment elevation. There are several studies that have been done between hsTn, CK-MB, and ISSTE with patient's prognosis and infarct size. There are some of those studies that are contradictory and there aren't any study about the direct correlation between ISSTE with hsTn and CK-MB, so this study will analyze the correlation between ISSTE with hsTn and CK-MB.

Materials and Methods: This is an observational analytic correlative study with cross sectional method in 2017-2022 STEMI patients in RSUDP NTB. Samples were taken with consecutive sampling method with inclusion and exclusion criterias. Datas were taken from medical records including ECG, hsTn/CK-MB test, risk factors, patient's characteristics, PCI status, and survival.

Results : There are 32 subjects in this study and Spearman test was used to test the correlation between ISSTE with hsTn and CK-MB. In this study, most subjects are male and aged >40 years old, with the most risk factor being hypertension. There is only 1 subject who died in this study. This study also measured the means for the cardiac markers, which are 8947,729 ng/L and 94,1 U/l for hsTn and CK-MB. This study also shows that there is a significant correlation between ISSTE with hsTn and CK-MB ($r=-0,536$).

Conclusion : In this study there is a moderate correlation between ISSTE with hsTn and CK-MB, where if the ISSTE value is high, hsTn and CK-MB values will be low, and vice versa.

Keywords: ISSTE, hsTn, CK-MB, STEMI



The Impact of High Intensity Training for Left Atrium Function and Remodelling in Special Forces

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Background and Aim

Light to moderate intensity training is important for health and well – being. In contrary, high intensity training increase the risk of ventricle and atrial remodelling and functional changes as cardiac adaptations, These adaptations are called the “athlete’s heart, these findings could lead to cardiovascular problem in latter age, particularly atrial fibrillation.”. In special forces, level of intensity training was higher than the regular athlete with longer period. The objective of this study was to investigate the impact of high intensity training for left atrial remodelling and function.

Materials and Methods

Left Atrium dimension and function assessed by tissue doppler and 2D speckle tracking between two groups. Linear regression was performed to compare the prevalence of abnormalities based on the worse 25th percentile for each measurement to determine the prevalence of diastolic, LA function and LAVi abnormalities in high intensity training population.

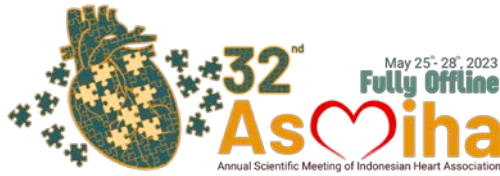
Results

Population with vigorous training strongly correlated with LAVi enlargement ($p < 0.0001$, OR 95%CI 5.56 (2.18 – 14.19)). On multivariable analyses higher PACS was independently associated with younger age, LA conduit was independently associated with younger age and normal IMT. Diastolic dysfunction were not associated with high intensity training.

Conclusion

Population with high intensity training had higher risk of LA enlargement but not causing the LA dysfunction.

Keywords: Left Atrium, remodelling, LA Strain, Diastolic Function



Radiation Dose Comparison between Dual Energy and Single Energy Coronary Computed Tomography Angiography

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Background and Aim. Coronary CT angiography (CCTA) presents precise assessment with high sensitivity for anatomical coronary evaluation. The advancement of technology had broaden potential of cardiac CT using spectral imaging. Dual Energy CT (DECT) has been introduced and potentially evaluating the changes in myocardial blood flow as iodine images. The introduction of DECT make this examination available not only assessing the anatomical condition, but also the flow to myocardium. We aimed to compare the radiation dose between dual energy and single energy in coronary CT Angiography.

Materials and Methods. This cross-sectional study took the data of patients with suspected or known for coronary artery disease that underwent coronary CT angiography in dual energy mode or single energy mode performed between February to March 2023 in National Cardiovascular Center Harapan Kita. We compared the radiation dose of 34 patient undergone DECT and 34 patients with single energy CT. Coronary CT Angiography examinations were done using a dual energy-dual source CT scanner, with protocol consisted of calcium score and arterial phase of coronary CT angiography.

Results. We analyzed the data from 43 males (63%) and 25 females (37%) with age of 58.6 +/- 11.38 years old, body weight of 68,67±10,65kg, BSA of 1,75 +/-0.16 m², BMI of 26.20 +/-3.95 kg/m², radiation dose of 450(239) mGycm. There was no difference of BW (p 0.31) BSA (p 0.84) and BMI (p 0.10) between groups. There was no difference of radiation dose between dual energy and single energy CT (p 0.691). Radiation dose from dual energy CT group was 424.50(309.75) mGycm, while single energy CT group was 475(226.25) mGycm. We also found that the radiation dose has strong positive correlation with body weight (p <0.001; r 0.644) and BSA(p<0.001; r 0.621) in dual energy CT group, and has no correlation with body weight (p 0.053) and BSA (p 0.159) in single energy CT group.

Conclusion. In coronary CT angiography, radiation dose was not significantly different between dual energy and single energy mode. This finding supports dual energy CT mode to increase sensitivity of coronary CT angiography with its ability to get iodine map for myocardial perfusion evaluation in addition to coronary anatomical evaluation.

Keywords: dual energy, radiation dose, coronary computed tomography



USABILITY TESTING OF ANDROID-BASED HEART FAILURE REGISTRY IN YOGYAKARTA (ORION-HF/YOGYAKARTA REGISTRY ON HEART FAILURE)

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Background and Aims

An innovation is needed to create a well-integrated register for heart failure patients in Indonesia, which has a large geographical area and a hierarchical health service system. The ORION-HF application was developed for this purpose. The developed application requires usability testing. Usability testing is assessment to identify specific problems with IT products and focuses on the interaction between users and tasks. The analysis results can be a source of input for improving the application so that it is ready for operational implementation. The purpose of this study is to describe the usability of the ORION-HF application.

Materials and Methods

This research used a descriptive qualitative design located at hospitals around RSUP Dr. Sardjito Yogyakarta. The informants in this study were users of the ORION-HF application. Quantitative and qualitative data collection was carried out in this study.

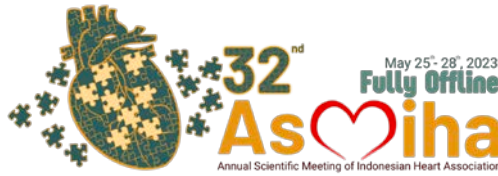
Result

The results of user performance measurements obtained a sufficient fast task completion time, the longest time required to fill in patient data was 446 seconds. Most tasks were completed completely and correctly. 36 errors were identified and most were cosmetic. The user perceived about the usefulness of the application is that the application is considered to have included the data needed for a register. According to users, the application is easy to learn and has a sufficient speed.

Conclusion

Improvements need to be made to several features, routine maintenance on the application can be done to avoid disruptions of the application. It is still necessary to explore other usability attributes in the Health ITUEM theory framework in evaluating the usefulness of information system products and using other usability evaluation models such as comparative or verification testing to explore the advantages and disadvantages of some products at the stage of overall system development.

Keywords: Usability testing, heart failure, user performance, user perceived, Health-ITUEM



Echocardiography Findings Profile in Patients with Mitral Stenosis at Adam Malik General Hospital: A Retrospective Observational Study

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¹University of Sumatera Utara

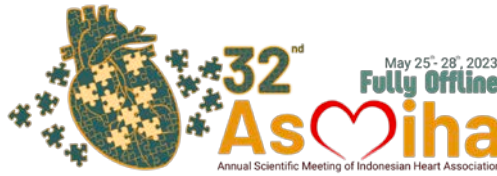
Background and aims: Mitral stenosis (MS) is a common valvular heart disease characterized by the narrowing of the mitral valve orifice, leading to impaired blood flow from the left atrium to the left ventricle. Echocardiography is a non-invasive diagnostic tool used to evaluate the severity and progression of MS.

Materials and methods: We conducted a retrospective observational study of patients diagnosed with MS who underwent echocardiography at Adam Malik General Hospital between January 2021 and December 2022. The demographic, clinical, and echocardiographic data of each patient were collected and analyzed.

Results: A total of 150 patients with MS were included in the study. The mean age was 40 years (range 17-75 years), and 62% of the patients were female. Rheumatic heart disease (98%) was identified as the most common etiology of MS. The mean mitral valve area (MVA) was 0.92 cm² (range 0.5-1.5 cm²), and the mean left atrial volume index (LAVI) was 100 mL/m² (range 16-34 mL/m²). Severe MS was observed in 80% of the patients, while mild to moderate MS was observed in 20% of the patients.

Conclusion: Our study provides a comprehensive profile of the echocardiography findings in patients with MS in Adam Malik General Hospital. Our findings highlight the importance of early detection and management of MS to prevent further complications and improve patient outcomes. Further studies are needed to evaluate the long-term outcomes of patients with MS and to identify potential risk factors for disease progression.

Keywords: Mitral Stenosis, Rheumatic Heart Disease, Echocardiography, MVA, LAVI



Accuracy of echocardiographic tricuspid regurgitation velocity to diagnosis pulmonary hypertension in congenital heart disease

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Abstract

Background and Aims: Pulmonary hypertension (PH) may lead to fatality in congenital heart disease (CHD). However, the gold standard of diagnosis through right heart catheterization (RHC) is not widely available in Indonesia. In this study, we investigated the accuracy of tricuspid regurgitation velocity (TRV) from transthoracic echocardiography (TTE) as a diagnostic modality for PH in CHD patients. As a widely used parameter, TRV has positive correlation with sPAP in the absence of RV outflow tract obstruction and/or pulmonic valve stenosis. Therefore, TRV may be a good candidate to define PH.

We investigated TRV in CHD patients. Diagnosis of PH was established by RHC. This study aims to evaluate accuracy of TRV as a possible diagnosis modality for PH in low-resource setting.

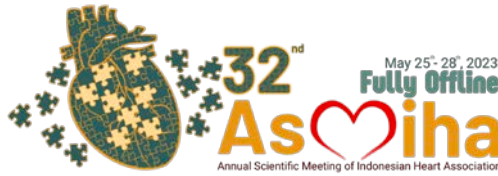
Material and Methods: a cross sectional study was conducted to analyse accuracy of TRV in pulmonary hypertension diagnosis. Parameters of diagnosis accuracy, including: sensitivity, specificity, positive predictive value (PPV) and negative predictive value (NPV) were statistically measured.

Results: A number of 221 CHD patients in Congenital Heart Disease and Pulmonary Hypertension (COHARD-PH) registry were recruited in this study, including: 12 PDA patients, 20 VSD patients and 189 patients with ASD. We found that sensitivity was 87.37%, specificity was 54.84%, PPV and NPV in these CHD patients were: 92.22% and 41.46%. Overall, the diagnostic accuracy of TRV to diagnose PH in CHD was 82.81% (95% CI: 77.17-87.54%). Our results indicate that TRV which is measured by TTE is a useful diagnostic modality to predict PH in CHD Patients.

Conclusion: a relatively high accuracy value of TRV may be used to diagnose PH condition of CHD patients in lower resource setting. In addition, higher TRV value may also be used as a risk stratification modality to screen patients who need further RHC examination.

Keywords: pulmonary hypertension, congenital heart disease, echocardiography, tricuspid regurgitation velocity, TRV

Statistics	ASD		VSD		PDA		CHD	
	Value	95% CI	Value	95% CI	Value	95% CI	Value	95% CI
Sensitivity	87.27%	81.21% to 91.95%	92.86%	66.13% to 99.82%	81.82%	48.22% to 97.72%	87.37%	81.79% to 91.74%
Specificity	50.00%	29.12% to 70.88%	66.67%	22.28% to 95.67%	100.00%	2.50% to 100.00%	54.84%	36.03% to 72.68%
Positive Predictive Value	92.31%	88.90% to 94.73%	86.67%	67.50% to 95.31%	100.00%	-	92.22%	88.91% to 94.61%
Negative Predictive Value	36.36%	24.51% to 50.15%	80.00%	35.77% to 96.64%	33.33%	12.49% to 63.66%	41.46%	30.22% to 53.67%
Accuracy	82.54%	76.36% to 87.67%	85.00%	62.11% to 96.79%	83.33%	51.59% to 97.91%	82.81%	77.17% to 87.54%



Correlation between De-Ritis Ratio and In Hospital Mortality in Patients with Acute Coronary Syndrome

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Background and Aims

The De-Ritis ratio (AST/ALT) is commonly used to screen for liver disease and survival in patients with advanced liver disease. These enzymes are often elevated in patients with Acute Coronary Syndrome (ACS). In our study we aim to investigate the correlation between De-Ritis ratio and the in-hospital mortality in patients with ACS.

Materials and Method

This cohort retrospective study included 163 adults with ACS admitted in the Cardiac Intensive Care Unit (CICU) Dr. Kariadi Hospital Semarang, treated from January until December 2022. The study population was obtained from the internal ACS registry in our center. The populations were divided into 2 groups, survived and deceased group. The AST/ALT ratio used in this study was taken on admission and analysed using Eta correlation test.

Results

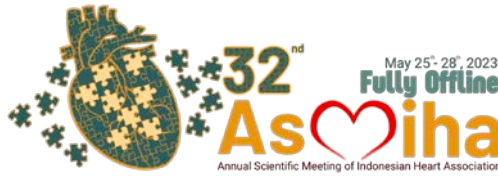
ST Elevation Myocardial Infarct (STEMI) was diagnosed in 134 patients (82,2%) and the rest of 29 patients diagnosed with Non ST Elevation Myocardial Infarct (NSTEMI) (17,8%). There were 61 patients died during hospitalization (37,4%) and for the survived group were 102 patients (62,2%). The AST/ALT ratio in deceased group was 1.84 ± 1.34 while in survived group was 2.20 ± 1.37 . There was no significant correlation between AST/ALT ratio and mortality rate ($r=0.123$; $p=0.110$).

Conclusion

In our study, The De-Ritis ratio on admission was not correlate to the In-Hospital mortality in patients with ACS. Prospective studies in larger cohorts are required to confirm our findings and to evaluate further whether the De Ritis ratios may represent a useful tool for determining the prognosis of patients with ACS.

Keywords: De-Ritis ratio, ACS, Mortality

Keywords: Keywords: De-Ritis ratio, ACS, Mortality



Factors Associated with Functional status by 6-minute Walk Test Performance in Indonesian Hajj Pilgrims

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Background and aim:

Indonesia has the highest number of Hajj Pilgrims almost every year in Saudi Arabia. The mortality rate of Indonesian Hajj Pilgrims was 2.1-3.2 per 1000 people in recent decades. Circulatory disease was one of the most frequent cause of Hajj's mortality. Six-minutes' walk test (6MWT) is a simple parameter test for obtaining functional exercise capacity. Performance of the Hajj, its rites, and overcrowding situations demand a good function capacity of a person in order to accomplish the Hajj properly. This study was intended to know associated factors of the 6MWT performance among Indonesia Hajj Pilgrims.

Materials and Methods:

This was a cross sectional study of 4900 participants who had Hajj Pilgrims preparation in 2022. Demographic data, smoking status, past illness history, physical vital examination, simple hematological and metabolic blood laboratory parameters, also 6MWT performance were obtained. We compared 6MWT results with other variables. Bivariate categorical data analysis was performed by using Chi-Square, the multivariate analysis was carried out using Logistic Regression.

Result:

Among the 4900 Hajj Pilgrims, 57,4% were female, 50,2% were in late middle age (45-59 years), 76,5% were obese, 30,8 % had hypertension, 35% had low and very low 6MWT performance. There was a relationship between sex, body mass index (BMI), smoker, blood tension, LDL, diabetes mellitus, hypertension, heart disease, stroke, and 6MWT performance among Hajj Pilgrims. The association of each variable can be seen in table 1.

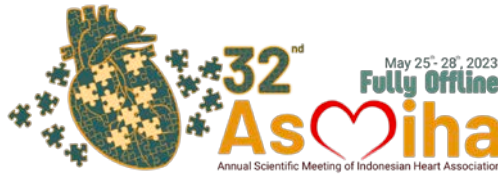
Conclusion:

Associated factors of 6MWT performance among Hajj Pilgrims were sex, BMI, smoker, blood tension, LDL, diabetes mellitus, hypertension, stroke, and heart disease. Because 6MWT has relationship with other cardiovascular risk factors, so it is recommended to perform 6MWT as a screening tools of functional exercise capacity in Hajj Pilgrims.

Keywords: 6-minute walk test, 6MWT, risk factors, Hajj Pilgrims

Variable	6MWT		OR	p value (p <0.05)	95% CI (Lower-Upper)
	Poor n (%)	Normal n (%)			
Demographies					
Sex, female	521 (10.6)	2289 (46.8)	0.69	<0.001	(0.578-0.824)
BMI, obese	641 (13.1)	3106 (63.4)	0.82	0.003	(0.675-0.997)
Smoker	70 (1.4)	506 (10.3)	1.056	0.006	(0.790-1.413)
Past Illness					
Hypertension	351 (7.2)	1157 (23.6)	0.60	<0.001	(0.505-7.33)
Heart Disease	51 (1.0)	156 (3.2)	0.66	0.001	(0.473-0.925)
Diabetes Mellitus	129 (2.6)	427 (8.7)	0.72	<0.001	(0.581-0.905)
Stroke	27 (0.6)	62 (1.3)	0.51	<0.001	(0.323-0.832)
Physical Examination					
Blood Pressure, High	392 (8.0)	1588 (32.4)	0.90	<0.001	(0.753-1.080)
Heart Rate, Tachycardia	74 (1.5)	179 (3.7)	0.53	<0.001	(0.402-0.719)
Lipid Profile					
LDL-C (>100 mg/dL)	643 (13.1)	3037 (62.0)	0.684	<0.001	(0.564-0.803)

Table 1. Multivariate analysis from each variable.



Characteristic and Health Status of Chronic Venous Insufficiency Patient at Siloam Hospital Lippo Village

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Background and Aims

The clinical spectrums of chronic venous insufficiency (CVI) in the lower limbs range from asymptomatic cosmetic issues to severe conditions including venous ulcers. Due to a lack of understanding of the severity and effect of the issue, healthcare personnel frequently ignore CVI, a medical condition that is very common. The purpose of this study is to characterize and assess the health condition of CVI patients in Indonesia.

Materials and Methods

This Study was conducted by Interview and doppler examination records of CVI patients at Siloam Lippo Village Hospital from December 2022 to March 2023. The EQ-5D questionnaire and associated health problems will be employed to interview study participants. Individuals who satisfy the criteria will contribute as the research's primary source of data. The study inclusion criteria are CVI patients who consent to fully participate, undergo doppler examination and are diagnosed at Siloam hospital Lippo Village. Pregnant women and participants under the age of eighteen are excluded from this study. Study data is processes using Excel.

Result

There were 94 patients eligible in this study, 36 (38.3%) are men and 58 (61.7%) are women with range age from 32-85. From all CVI patient, 12 (12.8%) of them were mild, 41 (43.6%) moderate, and 41 (43.6%) severe. 81 (86.3%) patients related to have health limitation while only 13(13,8%) people had no impairment. The most common symptoms are edema 73 (77.7%), Pain 69 (73,4%), and tingling 38 (40.4%). Other condition as Hypertension 55 (58,5%), Diabetes 41 (43,6%), Hypercholesterolemia 40 (42,6%), and MACE 21 (22,3%)

Conclusion

Individuals with CVI related to decreased health status, hypertension, and pain and swelling symptoms.

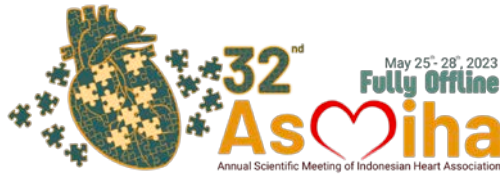
Keywords

Chronic Venous Insufficiency, Chronic Venous Disease, Varicose Veins, Health Status, EQ-5D

Keywords: Chronic Venous Insufficiency, Chronic Venous Disease, Varicose Veins, Health Status

		%	(n=94)
CVI		100	94
	Mild	12.8	12
	Moderate	43.6	41
	Severe	43.6	41
Health Status EQ-5D	With Limitation	86.2	81
	Without Limitation	13.8	13
Symptom	Edema	77.7	73
	Pain	73.4	69
	Tingling	40.4	38
	Rigidity	26.6	25
	Cramp	23.4	22
Other Condition	Hypertension	58.5	55
	Diabetes	43.6	41
	Hypercholesterolemia	42.6	40
	MACE	22.3	21

Figure 1. Frequency Table of Characteristic and Health Status of Chronic Venous Insufficiency Patient at Siloam Hospital Lippo Village



Relationship between Anion Gap and In Hospital Mortality in Patients with ST Segment Elevation Myocardial Infarction

J.P.S. Sianipar¹, W.N. Yuandika¹, Safir¹
RS dr. Kariadi-Universitas Diponegoro¹

Background and aims

The serum anion gap (AG) is a common test for evaluating acid-base disorders and determining the cause of metabolic acidosis. Current understanding of the prognostic impact of AG on mortality after acute myocardial infarction (AMI) is limited. This study aimed to investigate the relationship between serum AG levels and in-hospital mortality in patients with STEMI

Materials and Methods

This cohort retrospective study included 162 adults with ACS admitted in the Intensive Cardiac Care Unit (ICCU) treated from January until December 2022. The study population was obtained from the internal ACS registry in RSUP Dr. Kariadi Semarang. The samples were divided into 2 groups, survived and deceased group. The AG in this study was taken on admission.

Results

The majority of the sample was male, 125 patients (77,2%) and female for 37 patients (22.8%). There were 29 patients died during hospitalization (17.9%) and for the survived group were 133 patients (82.1%). The AG results were divided into 4 groups by AG tertiles : tertile I (AG<12, n = 85), tertile II (AG ≥12.1, <14.1, n = 26), III (AG ≥ 14.1, < 16.7, n = 19), IV (AG ≥ 16.7, n = 32). The elevated AG tertiles were strongly associated with higher in-hospital ($P < 0.001$)

Conclusion

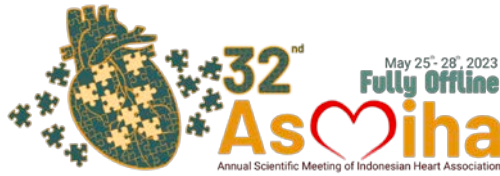
The elevated AG were associated with higher in-hospital in patients with ST Segment Elevation Myocardial Infarction.

Keywords : anion gap, mortality, STEMI

Keywords: anion gap, mortality, STEMI

Table 1. Baseline characteristics

Variables	Total (n = 162)	Death		p-value
		Yes (n = 29)	No (n = 133)	
Demographic Factors				
Age (years)				0.337
<65	124	20	104	
65 – 75	33	7	26	
>75	5	2	3	
Gender (n, %)				0.475
Male	125	21 (17)	104 (83)	
Female	37	8 (21)	29 (78)	
Body Mass Index (kg/m ²)				0.942
<18.5	6	1	5	
18.5 – 24.9	88	15	73	
>25	68	13	55	
CV History and Risk Factors, n (%)				
Diabetes Mellitus	60	16 (26)	44 (74)	0.026
Hypertension	84	16 (19)	68 (81)	0.693
Dyslipidemia	43	8 (18)	35 (82)	0.888
Current Smoker	99	14 (14)	85 (86)	0.142
Heart Failure	2	0	2	0.506
Previous PCI	18	4 (22)	14 (78)	0.534
Previous MI	4	2 (50)	2 (50)	0.147
Previous Stroke	5	0	5	0.586
AG Tertiles				
		Death (n=29)	Survive (n=133)	
Tertile 1 (AG<12)		3	82	
Tertile 2 (AG ≥12.1, <14.1)		6	20	
Tertile 3 (AG ≥ 14.1, < 16.7)		5	14	
Tertile 4 (AG ≥ 16.7)		15	17	



Blood Urea Nitrogen To Creatinine Ratio And In-Hospital Mortality Association Among Patients With ST-Elevation Myocardial Infarction

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Background and Aims

ST-Elevation Myocardial Infarction (STEMI) still has a high mortality rate even in this cardiac intervention era. Among many blood panels performed in STEMI patient, Blood Urea Nitrogen (BUN) and serum creatinine concentration (Cr) has been widely measured in daily clinical practice, but BUN-to-Cr Ratio (BCR) assessed for prognosis among patients admitted with STEMI showed a conflicting data. This study aimed to show the association of BCR with In-Hospital Mortality among STEMI patient at Dr. Kariadi Hospital, Semarang between January 2022 and February 2023.

Materials and Methods

This study is retrospective cohort study that include all STEMI patients receiving treatment at Dr. Kariadi Hospital, Semarang, between January 2022 and February 2023. Analytic study was performed using cross-tabulation with chi-square method to assess association of mortality.

Results

This study involved 162 patients with mortality rate of 17.9% (n=29). A total of 125 male patients were enrolled. Of 162 patients, 123 patients was under 65 y.o. Cross-tabulation analysis showed that 20 deceased patients (68.9%) had a Low BCR (<10) and 4 out of 133 (3%) survived patients had a High BCR. (P=0.012)

Conclusion

A decreased of BUN-to-Cr Ratio associated with increase of in-hospital mortality among STEMI patient at Dr. Kariadi Hospital, Semarang.

Keywords: Blood Urea Nitrogen, Serum Creatinine, STEMI, BUN to Creatinine Ratio.

Variables	Total (n = 162)	Death		p-value
		Yes (n = 29)	No (n = 133)	
Demographic Factors				
Age (years)				0.337
<65	124	20	104	
65 - 75	33	7	26	
>75	5	2	3	
Gender (n, %)				0.475
Male	125	21 (17)	104 (83)	
Female	37	8 (23)	29 (79)	
Body Mass Index (kg/m ²)				0.942
<18.5	6	1	5	
18.5 - 24.9	88	15	73	
>=25	68	13	55	
CV History and Risk Factors, n (%)				
Diabetes Mellitus	60	14 (23)	44 (74)	0.024
Hypertension	84	14 (17)	68 (81)	0.693
Dyslipidemia	43	8 (19)	35 (82)	0.888
Current Smoker	99	14 (14)	85 (86)	0.142
Heart Failure	2	0	2	0.506
Previous PCI	19	4 (22)	14 (73)	0.534
Previous MI	4	2 (50)	2 (50)	0.147
Previous Stroke	5	0	5	0.186

BCR_CAT * Mortality Crosstabulation

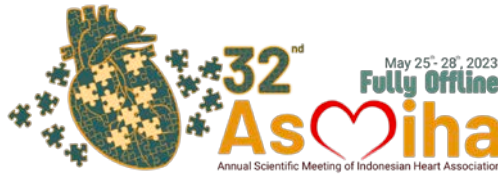
Count	BCR_CAT	Mortality		Total
		Yes	No	
	Low (<10)	20	115	135
	Normal (10-20)	9	14	23
	High (>20)	0	4	4
	Total	29	133	162

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	8.800 ^a	2	.012
Likelihood Ratio	8.196	2	.017
Linear-by-Linear Association	2.435	1	.119
N of Valid Cases	162		

a. 3 cells (50.0%) have expected count less than 5. The minimum expected count is .72.

Baseline Characteristic and Cross-Tabulation



Correlation between Platelet-lymphocyte Ratio and In Hospital Mortality in Patients with Acute Coronary Syndrome

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Background and Aims

Platelet-lymphocyte Ratio (PLR) is a prognostic marker in clinical practice which was shown to be associated with adverse outcomes. It includes the concept of platelet aggregation and inflammatory pathways. In the field of non-cardiovascular disease, PLR was proved to be an important inflammatory marker which predicted mortality in cancer population and neonate early-onset sepsis. In our study we aim to investigate the correlation between PLR and the in-hospital mortality in patients with Acute Coronary Syndrome (ACS).

Materials and Method

This cohort retrospective study included 124 adults with ACS admitted in the Cardiac Intensive Care Unit (CICU) Dr Kariadi Hospital Semarang treated from January until December 2022. The study population was obtained from the internal ACS registry. The populations were divided into 2 groups, survived and deceased group. The PLR used in this study was taken on admission.

Results

The majority of the sample was male, 95 patients (76,6%). Among this population, 90 patients (72,6%) were STEMI, and 34 patients (27,4%) were NSTEMI. There were 38 patients died during hospitalization (30,6%) and for the survived group were 86 patients (69,4%). The PLR in deceased group was 45.92 ± 54.41 while in survived group was 28.95 ± 33.58 . There was no correlation between PLR and mortality rate ($r = 0.108$; $p = 0.094$).

Conclusion

In our study, PLR on admission was not correlated to the In-Hospital mortality in patients with ACS. However, we found greater PLR value in deceased group comparing to survived group. Prospective studies in larger cohorts are required to confirm our findings and to evaluate further whether the PLR may represent a useful tool for determining the prognosis of patients with ACS.

Keywords: PLR, ACS, Mortality

Characteristics	F/Mean SD	%/Median (min/max)
Age	58.53 ± 9.142	59.00 (32-79)
Sex		
Female	29	23.4%
Male	95	76.6%
BMI	23.92 ± 3.173	23.55 (15-33)
DM		
Yes	46	37.1%
No	78	62.9%
Hypertension		
Yes	57	46.0%
No	67	54.0%
Dyslipidemia		
Yes	34	27.4%
No	90	72.6%
Smoker		
Yes	74	59.7%
No	50	40.3%
PLR	34.15 ± 41.613	22.00 (2-297)
Outcome		
Deceased	38	30.6%
Survive	86	69.4%
ACS		
STEMI	90	72.6%
NSTEMI	34	27.4%

Table 1. Baseline Characteristics



Inflammatory Marker in Heart Failure with Reduced Ejection Fraction Compared to Preserved Ejection Fraction

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Background and Aims: Globally, heart failure remains a condition with a high mortality and morbidity rate. Based on the left ventricular ejection fraction (LVEF), several types of heart failure are categorized. In prior studies, it was hypothesized that the profile of inflammatory markers might be associated with LVEF. This retrospective study aimed to investigate the difference in Inflammatory markers with LVEF classification in heart failure patients.

Materials and Methods: This research is a cross-sectional observational study with retrospective data collection. Dr. Sardjito Heart Failure Registry data were collected between January 2020 and February 2023. The ratios of neutrophils to lymphocytes and platelets to lymphocytes were collected from the Complete Blood Count. A transthoracic echocardiography was used to classify Left Ventricular Ejection Fractions into HFrEF and HFpEF. Receiver Operating Characteristic (ROC) curves were applied for analysis. Moreover, comorbid conditions were analyzed.

Results: This research involved 104 patients (63.5% male; 57.7% HFrEF; 44.3% geriatric; 11.3% obese). There were no differences in neutrophil, platelet, or lymphocyte counts between HFrEF and HFpEF patients (neutrophils 6.6 3.5 vs 7.1 4.5 x 10³/L, p = 0.492; platelets 255.01 100.96 vs 253.47 105.08 x 10³/L, p = 0.752; lymphocytes 1.6 0.73 vs 1.6 0. NLR and PLR did not differ between HFrEF and HFpEF patients (NLR, 4.83.5 vs 6.43.5 x 10³/L, p = 0.333; PLR, 174103 vs 205151 x 10³/L, p = 0.374). In the HFrEF group, smoking history was substantially higher (68.6%; 95% CI = 0.19-0.98).

Conclusion: There was no difference between HFrEF and HFpEF in the presentation of inflammatory markers. It is recommended that additional studies be conducted using the same number of patients with rEF and pEF as subjects.

Keywords: Heart Failure, Left Ventricle Ejection Fraction, Neutrophil-To-Lymphocyte Ratio, Platelet-To-Lymphocyte Ratio



Deep Dive into Knowing the Additional Value of TAPSE to EuroSCORE II in Predicting In-Hospital Mortality of Valvular Heart Surgery Patients

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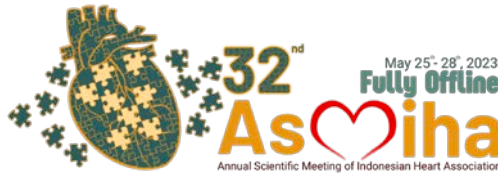
Background and Aim: European System for Cardiac Operative Risk Evaluation (EuroSCORE II) has widely been studied and used as a risk predictive model for in-hospital and long-term mortality for cardiac surgery. However, its use in valvular heart surgery (VHS) has poor validation test values. On the other side, right ventricular (RV) function is known to be a robust predictor of mortality in patients undergoing VHS, but it isn't included in EuroSCORE II. This study was conducted to see if RV function represented by Tricuspid Annular Plane Systolic Excursion (TAPSE) could increase predictive value of EuroSCORE II in predicting in-hospital and long-term mortality.

Material and Methods: A retrospective single-centre study was conducted involving 1842 patients underwent any type of VHS from 2018-2021. Bivariate and multivariate analysis in addition to validation studies were done to figure out whether TAPSE could increase the predictive value of EuroSCORE II in predicting in-hospital and long-term mortality.

Results: The observed in-hospital and long-term mortality on 4,5 years follow up were 9,0% and 18,8%, respectively. In predicting in-hospital mortality, the addition of TAPSE to EuroSCORE II showed better callibration values than that of EuroSCORE II only. (AUC=0,681 vs 0,686 ; Hosmer-Lemeshow (H-L) test p:0,065 vs 0,028) However, this didn't seem to happen with long-term survival where EuroSCORE (p < 0,0001) could, while TAPSE (p 0,643) could not be used as a predictor in multivariate analysis. Consequently didn't improve discriminatory and callibration values.

Conclusion: TAPSE increases the predictive value of EuroSCORE II for in-hospital mortality, but not for long-term mortality.

Keywords: valvular heart surgery, mortality risk score, EuroSCORE II, TAPSE, survival



Evaluation of Left Ventricular Diastolic Dysfunction Related to Significant Coronary Artery Disease in Stable Ischemic Heart Disease Patient

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Background and Aims: Left ventricular (LV) diastolic dysfunction (DD) is usually caused by poor LV relaxation, increased LV chamber stiffness, and LV filling pressure. In 2016, American Society of Echocardiography (ASE) developed guidelines for diagnosing LVDD, however its correlation with coronary artery disease in stable patients is unclear. This study aims to analyze whether ASE algorithm can detect LVDD related to significant CAD.

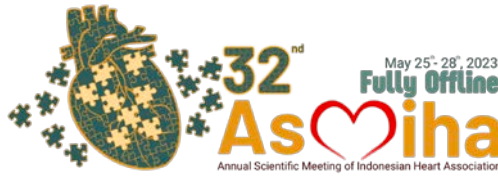
Material and Methods: An analytic observational study with prospective design was conducted at Integrated Cardiac Service Center of Dr. Soetomo General Hospital, Surabaya, Indonesia within January - December 2022. We enrolled stable CAD patient that underwent echocardiography at rest and coronary angiography for chest pain evaluation. LVDD was assessed using ASE algorithm before undergoing angiography procedure.

Results: We enrolled total 89 patients (73% were male, mean age 59 ± 9.1 years old). CAD was identified 65 (73%) patients during catheterization procedure. There was a significant different between CAD and non-CAD groups for several echocardiography parameter, namely; E/e' ($p=0.003$), Septal e' ($p=0.001$), Lateral e' ($p<0.001$), and E/A ($p=0.015$). Using ASE guidelines, 43 (48.3%) patients were normal, 12 (13.5%) were indeterminate, and 34 (38.2%) patients have LVDD (9 were grade I DD, 32 were grade II DD, and 5 were grade III DD). There is significant different between CAD and non-CAD groups who have LVDD (30 vs 4 patients, $p<0.024$).

Conclusion : ASE algorithm is an alternative tool that can be used to evaluate of LVDD related to significant CAD

Keywords: coronary artery disease, diastolic dysfunction, echocardiography

Keywords: coronary artery disease, diastolic dysfunction, echocardiography



Clinical Risk Factors Associated with High SYNTAX Score in Acute Non-ST Elevation Acute Coronary Syndrome: Pre-Diagnostic Coronary Angiography (DCA) Prognostic Variables in Predicting Necessity of Urgent Coronary Artery Bypass Graft (CABG)

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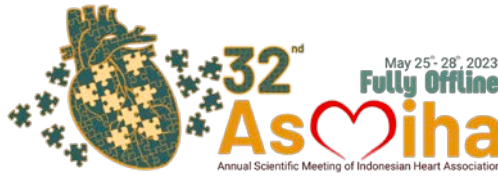
Background and Aim: Acute coronary syndrome is one of the leading cause of mortality worldwide. This study aims to discover the risk factors that influence the high SYNTAX score (>33) in acute NSTEMI-ACS patients that represent the urgency of CABG.

Materials and Methods: This study an observational retrospective cohort devising data from a single-center PCI experience registry at Integrated Heart Service Center, General Academic Hospital Dr. Soetomo, Surabaya, East Java, Indonesia. We identified acute NSTEMI-ACS patients undergoing PCI from January 2022 to December 2022 with various ranges of risk factors. Several baseline characteristics, CABG plan, and SYNTAX score were obtained and analyzed. The outcome measurement of high SYNTAX score is determined when the score is over 33. Univariate and multivariate logistic regression were performed with SPSS 26.0.

Results: Among 882 patients undergoing PCI, 77 (8.73%) patients were identified with acute NSTEMI-ACS, and most of the patients were male (72, 80.5%). The mean and standard deviation of age were 59.5 (10.68) years. From multivariate analysis of several characteristics showing $p < 0.25$ in univariate analysis, history of diabetes mellitus, history of smoking, history of previous coronary syndrome, current high systolic blood pressure, presence of ST depression, and NSTEMI-ACS risk category were the independent factors of high SYNTAX score indicating necessity of urgent CABG for the patient ($p < 0.05$). All patients who are being advised for urgent CABG have high SYNTAX score (>33). Same result showed in group of patients who are being advised for elective CABG. However, only 12 patients with high SYNTAX score in the group of patients who are not receiving CABG plan.

Conclusion: Diabetes mellitus, history of smoking, history of previous coronary syndrome, current high systolic blood pressure, presence of ST depression, and NSTEMI-ACS risk category were the independent factors of high SYNTAX score indicating necessity of urgent CABG. Future study with larger cohort is needed to confirm these findings.

Keywords: nste-acs, acute coronary syndrome, syntax score, cabg



Modifiable Risk Factors for Acute Coronary Syndrome: Population-Based Case-Control Study in Sleman Regency, Special Region of Yogyakarta, Indonesia

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Background and Aim

Millions of deaths under 70 years old are caused by coronary heart disease (CHD), mostly acute coronary syndrome (ACS). More than 75% of those occur in low- and middle-income countries including Indonesia. Currently, there is still a lack of data on modifiable risk factors for ACS in Indonesia, especially population-based data. This study investigated modifiable risk factors for ACS by comparing ACS patients and healthy subjects in similar population.

Materials and Methods

We established a population-based case-control study in Sleman regency, Yogyakarta. The case include 105 sleman populations who diagnosed as ACS at a referral hospital located in Sleman. Controls were appropriately matched for gender, age and family history of CHD, including 1050 respondents of Sleman Health and Demographic Surveillance System who indicated no ACS presence. Modifiable ACS risk factors include less physical activity, high salt intake, diabetes, hypertension, hypercholesterolemia, obesity, and smoking. Multivariate regression model is applied to determine independent risk factors for ACS events, expressed as adjusted odds ratio (AOR) and their 95% CIs. Population attributable risk (PAR) were also calculated to measure population health impact from each risk factor.

Results

Analysis of 1155 subjects indicated that less physical activity (AOR 6.4, PAR 36.1%), high salt intake (AOR 3.7, PAR 23.4%), hypertension (AOR 4.6, PAR 60.8%), diabetes (AOR 2.9, PAR 22.8%), hypercholesterolemia (AOR 1.7, PAR 28.4%), obesity (AOR 2.3, PAR 36.7%), and smoking (AOR 5.5, PAR 58.7%) were all significantly related to ACS ($p < 0.05$ for all risk factors).

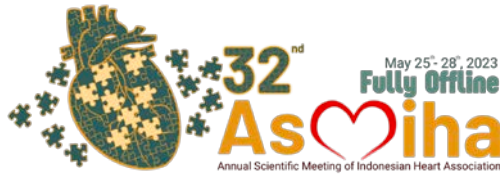
Conclusion

Less physical activity, high salt intake, hypertension, diabetes, hypercholesterolemia, obesity, and smoking are independent and significant modifiable risk factors for ACS events in Sleman population. This finding suggests that public health intervention is needed to prevent ACS events in this population.

Keywords: risk factors, ACS, physical activity, salt intake, population

Table showed Adjusted Odds ratio from multivariate regression analysis and population attributable risk (PAR)

Variable	Adjusted OR (95% CI)	P-value	PAR
Hypertension	4.3 (2.5-7.3)	<0.001	60.8%
Diabetes	2.8 (1.6-4.9)	<0.001	22.8%
Hypercholesterolemia	1.9 (1.1-3.1)	0.008	28.4%
Obesity	2.3 (1.4-3.8)	0.001	36.7%
Smoking	5.4 (3.2-9.0)	<0.001	58.7%
High salt intake	3.7 (2.1-6.4)	<0.001	23.4%
Less physical activity	6.1 (3.5-10.3)	<0.001	36.1%



Correlation Between Anemia and MACE in ACS Patients Who Admitted at CVCU M.Djamil General Hospital

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Background and aims: Clinical outcomes in patients with acute coronary syndrome are determined by the occurrence of complications known as major adverse cardiac events (MACE), which in this study we stratified as a series of events, including, acute heart failure (ADHF, ALO, cardiogenic shock), cardiac arrest, malignant arrhythmias (VT/VF) and mortality. Although the exact mechanism between anemia and MACE is still unclear, ACS patients who came with anemia have been known to have poor outcomes compared to patients without anemia.

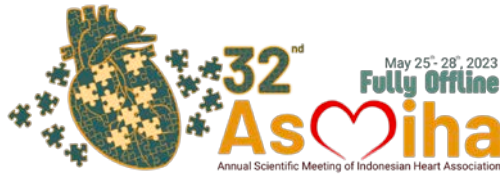
This study was conducted to determine the relationship between anemia and major cardiovascular adverse events (MACE) in patients with acute coronary syndrome.

Materials and methods: This type of research is observational analytic research using a cross-sectional design conducted between March 2021 and April 2022 in all ACS patients with a total of 531 patients and were followed up in one year in order to composite the occurrence of MACE.

Results: All ACS patients, are male predominantly higher than women (80% vs 20%) and the range age is 58-65 years old. Hypertension was identified as a major risk factor (55,6%) followed by diabetes Mellitus (26,9%) and dyslipidemia (6.8%). The patients with anemia were 41,2% and without anemia was 58,8%. The incidence of MACE in patients with anemia compared to patients without anemia was 219 patients with a p-value (of 0.003). Acute heart failure is the most common MACE in anemia patients and without anemia patients (54% vs 45.9%).

Conclusion: ACS patients with anemia demonstrated as a strong predictor of MACE in ACS patients. However further studies need to be done to establish the clear mechanism of MACE in ACS patients with anemia.

Keywords: anemia, MACE, ACS



Relationship Between Type 2 Diabetes with Circadian Blood Pressure Patterns

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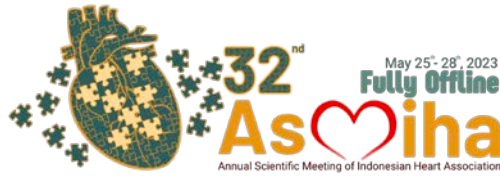
Background and aims: It was widely recognized that type 2 diabetes may influence blood pressure (BP) due to intrarenal renin-angiotensin system by hyperglycemia and sympathetic excitation by hyperinsulinemia. Type 2 diabetes is also related to inflammatory status that leads to cardiovascular events, renal failure, and other pathological changes. On the other hand, abnormal circadian BP patterns, specifically reverse dipping pattern, have been associated with inflammation resulting in an increased risk of target organ damage. There seems to be link between type 2 diabetes with circadian BP patterns. This study aims to assess relationship between type 2 diabetes with circadian BP patterns in hypertensive patients.

Materials and Method: This cross-sectional study was performed on diabetic (n=19) and non-diabetic (n=39) patients. A total of 58 hypertensive patients who underwent Ambulatory Blood Pressure Measurement (ABPM) at Central Army Hospital Gatot Soebroto were involved in our study. Circadian BP patterns were divided into three groups: dipping, non-dipping, and reverse dipping BP patterns.

Result: A total of 58 patients were analyzed. The patients were predominantly women (63,8%) with an average age was 61,34 years old and 55,2% of the patients were geriatric. We found that type 2 diabetes is significantly associated only with non-dipping (P=0,01, OR=0,18, 95% CI) and reverse dipping (P=0,012, OR=4,33, 95% CI) BP patterns. No statistically significant association was identified in dipping BP pattern group (P=0,968).

Conclusion: Type 2 diabetes is associated with non-dipping and reverse dipping BP patterns. In addition, the patients with type 2 diabetes had a significantly higher risk of developing the reverse dipping BP pattern.

Keywords: ambulatory blood pressure measurement, circadian patterns, diabetes, hypertension



Usefulness of Serum Ferritin as Mortality Predictors in Congestive Heart Failure Patients Experiencing Subclinical Iron Deficiency Syndrome

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Background and Aim. Anemia is the more frequent non-cardiac comorbidities found in congestive heart failure patients. Iron deficiency anemia, a non-traditional risk factor for CVD, occurs 35% in CHART-2, 58% in ATTEND, 57% in JCARE-CARD in heart failure patients. Iron deficiency and erythropoietin deficiency can aggravate cardiac workload and cardiac hypertrophy in chronic heart failure patients by adding further cardiac stress through increased heart rate, increased stroke volume, reduced renal blood flow, and fluid retention.

Materials and Methods. We retrospectively analyzed data of 93 CHF patient at Dr. Soetomo General Hospital, Surabaya hospitalized with congestive heart failure. We defined CHF based on NT pro BNP level on admission. Our primary outcome was all-cause mortality, whereas secondary outcome were HF re-hospitalization and in-hospital length of stay. Pearson or Spearman correlation coefficient (r) was used for bivariate analysis with SPSS 25.0.

Result. During 1-year follow-up, 22 CHF patient died and 36 CRAS patient were re-hospitalized. CRAS had a significantly greater of 1-year all-cause mortality rate compared to overall hospitalized chronic HF patients (23.66 vs. 11.71%, $p < 0.01$). There were negative correlations between serum ferritin with all-cause mortality ($r = -0.14$, $p = 0.02$) and in-hospital length of stay ($r = -0.42$, $p < 0.01$); however no correlation between serum ferritin and HF re-hospitalization was observed ($r = -0.06$, $p = 0.04$).

Conclusion. CRAS represents as an occurrence of iron deficiency, anemia, and renal dysfunction in congestive heart failure, leading to a worse prognosis than non-CRAS HF patients. Mortality rates increase with only anemia or renal dysfunction being present in patients. Furthermore, there is a negative correlation between serum ferritin and all-cause mortality in congestive heart failure patients.

Keywords: Anemia, CHF, Iron Deficiency, Heart Failure, Hemoglobin, Serum Ferritin