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# **The 5<sup>th</sup> Indonesian Intensive and Acute Cardiovascular Care Meeting**

## **Abstracts: Research Articles**



RESEARCH ARTICLE

**Acute/Chronic Glycemic Ratio is a Better Predictor of In-Hospital Outcomes than Admission Blood Glucose in Diabetic Acute Coronary Syndrome Patients**

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**Background** : Hyperglycemia and Acute Coronary Syndrome (ACS) are a deadly intersection, acute fluctuation rather than chronic and stable hyperglycemia relates to the adverse outcomes. Admission Blood Glucose (ABG) is subject to both conditions particularly in diabetes mellitus (DM) in whom elevated blood glucose do not necessarily indicate the acute hyperglycemia. Therefore, acute/chronic glycemic ratio (ACGR) will reveal true acute glycemic rise. We aimed to investigate whether the ACGR is better than ABG in predicting in-hospital outcomes in patients with ACS and DM.

**Methods** : 150 consecutive patients with ACS (STEMI ; NSTEMI/UA) and DM in Adam Malik Hospital Medan were collected from 2018 to 2019. We calculated ACGR by comparing ABG and estimated chronic glucose ( $[28.7 \times \text{HbA1c}] - 46.7$ ). Then we observed in-hospital outcomes that were defined as composite major adverse cardiac events (cardiac mortality, acute heart failure, cardiogenic shock, malignant arrhythmias). Statistical analysis was performed using mean difference, logistic regression, and receiver operating curve (ROC).

**Results** : Outcomes were observed in 61 (40.7%) patients. Bivariate analysis showed a significant relationship both ABG and ACGR with outcomes, but ACGR (AUC 90.1%) had better discriminative power than ABG (AUC 75.9%) in predicting outcomes with cut-off value was 1.05 (sensitivity 83.6% ; specificity 82%). In multivariate logistic regression, ACGR was the strongest predictor with OR value of 25.05 (95% CI 10.01–62.65 ; p value < 0.001).

**Conclusion**: ACGR can predict in-hospital outcomes better than ABG in patients with ACS and DM

**Keywords**: *Acute/Chronic Glycemic Ratio, Admission Blood Glucose, Acute Coronary Syndrome, Diabetes Mellitus, Major Adverse Cardiovascular Outcome*

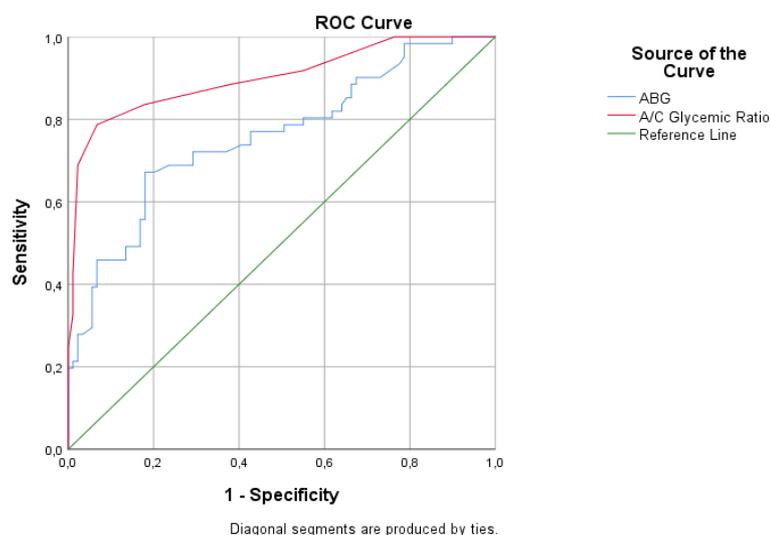


Figure 1. ROC Curve Comparison between Acute/Chronic Glycemic Ratio (ACGR) and Admission Blood Glucose (ABG) in Predicting In-Hospital Outcomes



RESEARCH ARTICLE

**The Prevalence of Transfusion Associated Circulatory Overload in CVCU of Dr. Saiful Anwar General Hospital, Malang, East Java, Indonesia**

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**Background:** Transfusion associated circulatory overload (TACO) is cardiogenic pulmonary edema caused by the rapid or large infusion of blood products. TACO is a serious yet under-recognized complication of blood therapy. The aim of this study was to ascertain the prevalence of transfusion associated with circulatory overload in patients receiving blood transfusion in CVCU of Dr. Saiful Anwar General Hospital, Malang.

**Method:** The study was a retrospective analytic in patients in CVCU of Dr. Saiful Anwar General Hospital Malang in July to December 2019 that received blood transfusion during hospitalization. The presence of TACO as the blood transfusion complication was compared with the non-complication group.

**Result:** A total of 36 patients met study criteria in July to December 2019, respectively. The incidence of TACO was 30.5% (11 of 36), with comparable rates for men (36.4% [4 of 11]) and women (63.6% [7 of 11]).

**Conclusion:** The prevalence of TACO as a complication post blood transfusion is lower than the non-complication group in CVCU of Dr. Saiful Anwar Malang in July to December 2019. This might be one of the reasons TACO is poorly recognized and understood.

**Keywords:** transfusion associated circulatory overload; pulmonary edema; blood transfusion.



RESEARCH ARTICLE

**The Role of Hypertension as The Risk Factor of TACO: a Population-Based Study in CVCU of Dr. Saiful Anwar General Hospital, Malang, East Java, Indonesia**

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**Background:** Transfusion associated circulatory overload is an established complication of blood transfusion, but it is seriously under-diagnosed and reported. This may be due to the lack of understanding of its diagnostic criteria, the reliance of the blood bank on the passive reporting system, and pre-existing patient factors that mask this complication. TACO includes any of the following four conditions that occur within 6 hours of transfusion - acute respiratory distress, tachycardia, elevated blood pressure (BP), acute or worsening pulmonary edema, and evidence of positive fluid balance. It is well known that it is related to extending the length of the intensive care unit (ICU) and hospital stay. Hypertension is one of the cardiovascular risk factors in TACO patients. The aim of this study was to ascertain the prevalence of transfusion associated with circulatory overload in patients with and without pre-existing hypertension in CVCU of Dr. Saiful Anwar General Hospital, Malang.

**Method:** This was a population-based study in 11 patients with TACO confirmed with lung ultrasonography and echocardiography at CVCU of Dr. Saiful Anwar Malang in July to December 2019. The presence of TACO in patients with and without pre-existing hypertension were compared.

**Result:** 8 patients (72.7%) with pre-existing hypertension and 3 non-hypertensive patients (27.3%) have TACO. The prevalence of TACO was higher in the hypertensive patients group than non-hypertensive patients.

**Conclusion:** As expected, in the group of TACO patients, they with pre-existing hypertension was significantly higher than patients without hypertension. Moreover, Hypertension is the most common and modifiable risk factor for development of transfusion associated with circulatory overload.

**Keywords:** transfusion associated circulatory overload; pulmonary edema; hypertension



RESEARCH ARTICLE

**A Simplified Scoring System to Predict Reversibility of High-Grade AV Block from STEMI Patient after Primary PCI: Another Key for Reducing Length of Stay at Cardiovascular Intensive Care Unit**

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**Background:** The length of stay (LOS) in the Cardiovascular Intensive Care Unit (CICU) is an important indicator of treatment. One of the parameters that affect LOS is reversibility time of High-Grade AV Block (HGAVB) from STEMI Patient. The prediction reversibility from HGAVB after primary PCI needs a simplified scoring system. Hence, this study aims to analyze the predictors for reversibility of HGAVB of patients who are hospitalized at CICU of Sardjito General Hospital Yogyakarta and to create a reversibility probability score.

**Methods:** Data were obtained from SCIENCE (Sardjito Cardiovascular Intensive Care) registry. Outcomes of 166 consecutive patients with HGAVB complication due to STEMI Inferior (mean age 60 ± 11 years) from June 2019 to November 2021 were recorded retrospectively. Demography, risk factor, comorbidities, laboratory result and other examinations were analyzed by multivariate Logistic regression to create two models of scoring system (probability and cut-off model) to predict reversibility of HGAVB in 3 days (average reversibility time in our patients) after PCI.

**Results:** A total of 166 subjects were included in this research. Multiple logistic regression analysis showed some variables that became independent predictor of 3 days reversibility of HGAVB, i.e. age ≥ 60 years, killip classification III-IV, RCA TIMI 3 Flow after PCI, complication of acute heart failure, decrease of RV systolic (TAPSE <17) and the presentation of persistent HGAVB after PCI. Receiver operating characteristic (ROC) curve analysis showed a cut-off model scoring system with score -2 to +1 predicting 3 days reversibility of HGAVB compared to score +2 to +6. This model yielded sensitivity of 70% and specificity 49%. While the probability scoring system (score -2 to +6) showed that the higher the score, the lowest 3 days reversibility of HGAVB probability (e.g. the reversibility of patient with score -1 is 78.2%; while the reversibility of HGAVB in patient with score +5 is 25.2%).

**Conclusions:** Scoring system derived from this study can be used to predict the probability of 3 days reversibility from HGAVB of patients who are hospitalized in our CICU and it can be a consideration for performing temporary pacemaker implantation in purpose of reducing LOS of patients.

**Keywords:** Scoring system; reversibility of HGAVB; CICU patients



RESEARCH ARTICLE

Left Atrial Structure Of Atrial Fibrillation Patients In Sanglah General Hospital

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**Background:** Atrial Fibrillation (AF) is the most common cardiac arrhythmia in adults. AF is associated with an elevated risk of stroke and death. Atrial remodeling, defined as any change in atrial structure or function that promotes atrial arrhythmias, can cause AF. Remodeling can be due to underlying cardiac conditions, systemic processes, or AF itself. Based on temporal pattern, AF is classified into paroxysmal and non-paroxysmal AF (long standing persistent, persistent and permanent). Progression from paroxysmal to non-paroxysmal AF is often characterized by advancing atrial structural remodelling. AF increases the risk of stroke five-fold. Current guidelines recommend using CHA<sub>2</sub>DS<sub>2</sub>-VASc score for stroke risk stratification. We aim to know the relationship between left atrial structure, temporal pattern and risk of stroke in AF patients.

**Methods:** Data was extracted from Sanglah General Hospital's online database and medical record. All atrial fibrillation patients, receiving warfarin, and visiting outpatient clinics in Sanglah General Hospital were included in this study. Left atrial and ventricle structure were compared across AF types and CHA<sub>2</sub>DS<sub>2</sub>-VASc scores as an estimate of stroke risk. Kruskal-Wallis test and Mann-Whitney post hoc test was used in this study.

**Results:** Left atrial and ventricle structure was assessed by transthoracic echocardiography in 77 participants (mean age 54 ± 14.3 years, 50.6% women). Of all participants, 49.4% were in paroxysmal AF, 19.5% in persistent AF and 35.1% in long standing persistent. Left atrial volume index (LAVI), left atrial diameter and left ventricular mass index (LVMI) showed differences across AF types and CHA<sub>2</sub>DS<sub>2</sub>-VASc score (P<0,001). With an increasing duration of AF and higher CHA<sub>2</sub>DS<sub>2</sub>-VASc scores, LAVI, LA Diameter and LVMI increased. Post Hoc analysis showed significant differences in paroxysmal AF versus long standing persistent AF and low (≤2) CHA<sub>2</sub>DS<sub>2</sub>-VASc score versus high (4-6) CHA<sub>2</sub>DS<sub>2</sub>-VASc score.

**Conclusions:** LA structures were increasingly abnormal throughout the course of the AF and higher stroke risk estimated by CHA<sub>2</sub>DS<sub>2</sub>-VASc score. This suggests that the early detection and treatment of AF is very important.

**Keywords:** Atrial fibrillation, Left atrium, Stroke, Echocardiography



RESEARCH ARTICLE

**CardiCoVs (Cardiac Covid-19 Ventilator Score): A Novel Predictive Score Based on Cardiac Risk Factors and Electrocardiography for Risk of Invasive Mechanical Ventilation Needs in COVID-19 Patient**

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**Background:** COVID-19 patients with cardiac risk factors and ECG abnormalities often have a worse outcome thus increasing ventilator demand. Proper simple triage score based on cardiac risk factors and ECG abnormalities may allow reasonable and cost-effective allocation of invasive mechanical ventilators. Thus, we propose a novel predictive score for the usage of invasive mechanical ventilators based on cardiac risk factors and ECG findings in COVID-19 patient.

**Material and Methods:** This retrospective cohort included the COVID-19 case from Provincial COVID-19 registry March 2020 to June 2021. We examined all variables related to demography, clinical findings, cardiac risk screening, laboratory tests, ventilator usage and ECG interpreted by two cardiologists. Data were analysed using SPSS 25.0. The discriminative power of the risk model was assessed by calculating the area under the receiver operating characteristic curves (AUC).

**Result:** Out of 152.860 confirmed COVID-19 cases, hospitalised COVID-19 patients that fulfilled the inclusion and exclusion criteria (n: 2.358) were selected with prevalence of ventilator use was 6,7% (165). After multivariable adjustment and stepwise elimination, 11 of 52 variables were retained in the final model and each variable has a different risk score. Model discrimination was good in the validation dataset for predicting ventilator use (C-statistic=0.808; 0.776-0.840). The Hosmer and Lemeshow Test showed good calibration (p 0.844). Using the cut-off point of >9, we can obtain a sensitivity of 85% and specificity of 82.2% to predict in-hospital usage of invasive mechanical ventilators for COVID-19 patients.

**Conclusion:** This developed and validated score based on cardiac risk and electrocardiography can aid physicians in predicting ventilator needs for COVID-19 during surge periods.

**Keywords:** COVID-19, Cardiac, Electrocardiography, Mortality, Score



RESEARCH ARTICLE

**Association Of Cardiometabolic Disease With Multiple Pre-existing Comorbidities and Its Impact On COVID-19 Patients Hospitalized At Sanglah General Hospital Denpasar, Bali, Indonesia In 2021: Complexity Lens Of COVID-19, A New Challenge On Fighting The Pandemic?**

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**Background and Aims:** Cardiometabolic disease describes a combination of metabolic abnormalities that increases the risk of type 2 diabetes mellitus (T2DM) and cardiovascular diseases (CVD). Cardiometabolic disease is associated with both increased susceptibility to COVID-19 and worse outcomes of COVID-19. This study aims to identify the association of cardiometabolic disease with pre-existing comorbidities and its impact on COVID-19 patients.

**Material and Methods:** This research is an observational analytic study with a cross-sectional approach. The data used is secondary data from the records of COVID-19 patients who were hospitalized at Sanglah Hospital on 1 January 2021- 31 December 2021 using the total sampling technique.

**Results:** There were 345 patients included in this study. The majority of patients were male (n=175; 50.7%) with the median overall patient age of 57 years old. Most of the patients were classified as severe COVID-19 (n=224; 64.9%). A total 240 patients has cardiometabolic disease (69.6%). Most of the comorbidities found in the patients were cardiovascular disease (n=134; 38.8%) and diabetes mellitus type 2 (DMT2) (n=105; 30.4%), consecutively. The prevalence of in-hospital death and ventilator usage were 24.9% and 16.2%, respectively. The median of hospitalization duration was 9 days. There were significant differences in neutrophils to lymphocytes ratio (p=0.027), c-reactive protein (p=0.006), serum creatinine (p=0.000), and blood urea nitrogen (p=0.000) in patients classified based on the incidence of cardiometabolic disease. From chi-square analysis, it was found that mortality (PR=1.215; 95%CI=1.060-1.393;p=0.013), lung edema (PR=1.461;95%CI=1.358-1.571;p=0.020), atherosclerosis (PR=1.329;95%CI=1.170-1.510;p=0.000), sepsis (PR=1.421;95%CI=1.273-1.587;p=0.000), and cerebrovascular disease (PR=1.385;95%CI=1.211-1.584;p=0.018) were significantly associated with the cardiometabolic disease in the patients. From logistic regression analysis, it was found that there was a significant association of sepsis (PR=4.955; 95%CI=1.095-22.424;p=0.038), and atherosclerosis (PR=3.018;95%CI=1.651-5.516;p=0.000) with cardiometabolic disease of the patients. Association of cardiovascular disease with pre-existing comorbidities such as DMT2 (PR=1.770;95%CI=1.202-2.605;p=0.006), kidney disease (PR=1.528;95%CI=1.006-2.322;p=0.045) and hypertension (PR=1.741;95%CI=1.170-2.590;p=0.010) were significantly associated with mortality of the patients.

**Conclusions:** There was a significant association between pre-existing comorbidities and the incidence of cardiometabolic disease in COVID-19 patients. Early intervention on these factors can prevent further mortality.

**Keywords:** Cardiometabolic disease, COVID-19, Comorbidities, Outcome



RESEARCH ARTICLE

**Impact Of COVID-19 and Role Of Laboratory Parameter On Outcome Of All Types Of Cardiovascular Emergency Patients Admitted to Intensive Cardiovascular Care Unit In Sanglah Hospital Bali, Indonesia: How COVID-19 Affecting The Systematic Approach and Consideration To Acute Cardiovascular Emergencies In The Pandemic Situation**

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**Background and Aims:** COVID-19 comorbidity seems to be linked with worse outcomes and increased risk of death in patients with cardiovascular emergencies. COVID-19 also worsening the disease progression and patient's condition. This study aims to determine the impact of COVID-19 with its laboratory parameter on outcome of patients with cardiovascular emergency.

**Material and Methods:** This research is an analytic study with a cross-sectional approach. The data used is secondary data from the records of patients who were admitted to intensive cardiovascular care unit at Sanglah Hospital on 1 January 2021- 31 December 2021 using the total sampling technique.

**Results:** There were 511 patients included in this study. The majority of patients were male (n=362, 70.8%) with the median overall patient age of 58 years old. Most of the cardiovascular emergency and underlying comorbidities found in the patients were acute coronary syndrome (n=464; 90.8%) and kidney disease (n=232; 45.4%). A total of 124 patients confirmed as COVID-19 (24.3%). The prevalence of mortality was 19.0%. There were significant differences in length of in-hospital stay duration (p=0.001), white blood cells (p=0.000), haemoglobin (p=0.001), neutrophils count (p=0.000), lymphocyte count (p=0.000), SGOT (p=0.000), SGPT (p=0.000), BUN (p=0.000), SC (p=0.001), GFR (p=0.000) and neutrophils to lymphocytes ratio (p=0.002) in the patients classified based on COVID-19 comorbidity. From chi-square analysis, it was found that ventilator usage (PR=1.781; 95%CI=1.121-2.828;p=0.027), mortality (PR=2.431;95%CI=1.816-3.255;p=0.000), cardiogenic shock (PR=2.209;95%CI=1.612-3.027;p=0.000), malignant arrhythmia (PR=1.412;95%CI=1.030-1.937;p=0.036), diabetes mellitus type 2 (DMT2) (PR=1.250;95%CI=1.001-1.725;p=0.047), sepsis (PR=2.846;95%CI=2.083-3.889;p=0.000), and kidney disease (PR=2.187;95%CI=1.581-3.023;p=0.0000) were significantly associated with COVID-19. Based on the chest x-ray examination, it was found that lung edema (PR=1.466;95%CI=1.074-2.001;p=0.018) and pleural effusion (PR=1.735;95%CI=1.280-2.352;p=0.001) were significantly associated with COVID-19. From logistic regression analysis, it was found that there was a significant association of kidney disease (PR=1.905;95%CI=1.178-3.083;p=0.009), sepsis (PR=3.186;95%CI=1.380-7.355;p=0.007), and DMT2 (PR=1.540;95%CI=1.933-2.543;p=0.048) with the COVID-19. ROC curved showed the optimal cut-off hemoglobin for the in-hospital death prediction was >11.63% with sensitivity of 70.0% and specificity of 53.6%.

**Conclusions:** There was a significant association between pre-existing comorbidities and laboratory parameters with COVID-19 in the patients. Early intervention on these factors can prevent further mortality.

**Keywords:** Cardiovascular emergencies, COVID-19, Laboratory parameter, Comorbidities, Intensive care unit



RESEARCH ARTICLE

**Prognostic Value Of Residual Syntax Score Combined With Acef Score In Acute Coronary Syndrome Patient After Percutaneous Coronary Intervention In Saiful Anwar Hospital Malang**

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**Background and Aims:** Percutaneous coronary intervention (PCI) is one of the revascularization options in patients with clinical acute coronary syndrome (ACS) who often have multiple and complex vascular lesions. Physician decision to complete revascularization is still a topic that is widely explored to reduce the rate of rehospitalization and reinfarction. This study aims to determine the predictor value of rehospitalization and reinfarction events that can be used in ACS patients undergoing PCI using coronary angiography parameters with residual SYNTAX scores and clinical parameters using ACEF scores.

**Material and Methods:** The study was cohort prospective with the inclusion criteria being all ACS patients who underwent PCI in RSUD Dr. Saiful Anwar Malang from January 2018 to July 2021. All patients underwent PCI and underwent coronary angiography evaluation after PCI with a residual SYNTAX score (rSS) and divided the categories into  $rSS \leq 8$  and  $rSS > 8$ . All patients underwent laboratory examination of serum creatinine and post-PCI echocardiography, and an ACEF score was obtained (ACEF score = age/left ventricular ejection fraction + 1 [if serum creatinine >2 mg/dl]). Research subjects will be followed up for at least 1 year related to the incidence of post-PCI rehospitalization and reinfarction

**Result:** From a total sample of 209 patients, it was found that the residual SYNTAX score data had the most significant predictive factor for the occurrence of rehospitalization at 1 year after PCI (OR 6.14 [95% CI, 1.92-1967]). At the value of  $rSS > 8$ , (AUC 0.750 [95% CI, 0.682-0.818], p 0.001) has a good predictive value for the occurrence of rehospitalization. However, combining with clinical parameters using the ACEF score provides a better predictive value. This study shows that the combination of  $rSS > 8$  and ACEF score >1.2 provides a better predictive value (AUC 0.884 [95% CI, 0.832-0.936) for the incidence of rehospitalization in post-PCI ACS patients.

**Conclusion:** Acute coronary syndrome patients with residual SYNTAX scores > 8 and ACEF scores > 1.2 had a strong predictive value for rehospitalization events 1 year after PCI. The use of the combination of these two scores is expected to be a clinical guide to obtain the degree of completeness of revascularization in ACS patients.

**Keywords:** acute coronary syndrome, percutaneous coronary intervention, residual SYNTAX score, ACEF score.



RESEARCH ARTICLE

**Terminal QRS Distortion on admission ECG in STEMI Patients and its Correlation to Mortality in H. Adam Malik Hospital**

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**Background and aims:** Mortality during hospitalization in STEMI patients remains high. Mortality risk assessment needs to be done on admission, when only the history, physical examination and the ECG are available. Terminal QRS distortion on admission ECG can be used for determining the degree of ischemia severity in STEMI patients and as a predictor of mortality.

**Material and methods:** A cohort retrospective study was conducted using data of STEMI patients at H. Adam Malik Hospital from May 2019 to March 2020. STEMI patients are divided into two groups, one group with terminal QRS distortion on admission ECG and one group without QRS distortion. The mortality during hospitalization and six months after hospitalization was observed. Statistical analysis was performed using mean difference, logistic regression, and Kaplan-Meier curve for survival analysis.

**Results:** Total sample was 60 patients with STEMI, 43.30% patients with terminal QRS distortion. Hospital mortality was found to be significantly more in subjects with distortion than those without (42.30% vs 14.70%,  $p < 0.05$ ) and mortality after six months of follow-up were higher in distortion vs non distortion group (40.00% vs 13.80%) with an adjusted HR: 3.59 (95% CI: 1.01-12.77,  $p < 0.05$ ).

**Conclusion:** Terminal QRS distortion on admission ECG is a simple and quick parameter that can be used for predicting hospital mortality and still significant until six months after hospitalization in STEMI patients.

**Keywords:** QRS distortion, ECG, STEMI, mortality



RESEARCH ARTICLE

**Correlation Between Calcium Level with ARDS In Covid-19**

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**Background and aims:** The Covid-19 infection has become a global health concern regarding the severity of the disease. Hypocalcemia has been identified as a potential diagnostic and prognostic marker of COVID-19 infection with Acute Respiratory Distress Syndrome in numerous cases. This research analyzed the correlation between calcium level with ARDS in Covid-19 patients.

**Material and Methods:** Data were collected from the medical records of patients diagnosed with Covid-19 and positive PCR swab test results at Djatiroto Lumajang Hospital in East Java admitted from June 1st to August 31st, 2021. This is a single-center, cross-sectional study using bivariate analysis methods. ARDS was diagnosed by determining SaO<sub>2</sub>/FiO<sub>2</sub> ratio using a pulse oximeter.

**Results:** All of 145 Covid-19 patients were hypocalcemia and the majority of them were not suffering from ARDS. (78%). Bivariate analysis using Mann-Whitney test showed no significant correlation between calcium level and ARDS in Covid-19 (P=0,175).

**Conclusion:** There was no significant correlation between calcium level and ARDS in Covid-19 patients

**Keywords:** *Calcium Level, ARDS, Covid-19*



RESEARCH ARTICLE

**The Correlation between P Wave Duration and SYNTAX Scores for Assessing the Severity of Coronary Lesions in NSTEMI Patients**

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**Background.** Non-ST Segment Elevation Myocardial Infarction (NSTEMI) is one of the spectrums of Acute Coronary Syndrome (ACS) with a high mortality rate. Patients with NSTEMI require early risk stratification to define invasive strategies. Electrocardiography (ECG) has been proven useful for detecting cardiac abnormalities due to ACS. One of the ECG parameters used is the P wave duration. The severity of myocardial ischemia or infarction depends on the lesion of the coronary artery and can be measured based on the SYNTAX score. This study aimed to determine the relationship between the P wave peak time and the SYNTAX scores.

**Methods.** This is a cross-sectional study of NSTEMI patients who underwent angiography at the RSUP HAM from July 2020 to June 2021. Measurements of P wave duration on ECG were made in leads II. The SYNTAX score was calculated based on the results of the angiography. Bivariate analysis was conducted to assess the correlation between the two variables. Then, ROC analysis was performed to assess the P wave duration as a predictor of coronary lesion severity.

**Result:** Total subjects were 60 NSTEMI patients consisting of 37 (61.66%) patients with severe coronary lesions (SYNTAX score < 23) and 23 (38.33%) patients with non-severe coronary lesions (SYNTAX score ≥ 23). P wave duration was higher in the severe coronary lesion group than the non-severe group (119.16 ± 9.74 ms vs 109.13 ± 13.27 ms; p value 0.003). There was a moderate positive correlation between the P wave duration and the SYNTAX score in lead II (r = 0.472; p < 0.001). Based on ROC analysis, the P wave duration can predict the severity of coronary lesions with AUC = 0.72, and the cut off was 114.5 ms with sensitivity 75.7% and specificity 60.9%.

**Conclusion.** The P wave duration on the ECG has a correlation with the SYNTAX score and can predict the severity of coronary lesions in NSTEMI patients.

**Keywords:** NSTEMI, P wave duration, SYNTAX score, coronary lesion



RESEARCH ARTICLE

**Approach to NSTEMI patients with High-Risk Stratification between Conservative versus Invasive Strategy: What Can We Learn from Our Population in Sardjito Hospital?**

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**Background and aim :** The European Society of Cardiology (ESC) has published its recent guidelines regarding the management of non-ST-segment elevation myocardial infarction (NSTEMI) in 2020. The early invasive strategy is the recommended strategy to treat high-risk NSTEMI patients. However, there are few studies that reported conflicting results regarding the superiority of the invasive strategy from the conservative strategy in terms of in-hospital mortality outcomes. The benefit of using an invasive strategy in Indonesia, especially in high-risk NSTEMI patients remains unclear. The aims are to compare in-hospital mortality, length of stay, and rehospitalization between high-risk NSTEMI patients who underwent invasive strategy and conservative strategy.

**Material and Methods:** This is a cross-sectional study using the data from Sardjito Cardiovascular Intensive Care (SCIENCE) registry from January to December 2021. We included all high-risk NSTEMI patients with a total of 61 patients. The subjects were divided into the conservative group who received only recommended medical therapy, and the invasive group who received recommended medical therapy and underwent coronary angiography with percutaneous coronary intervention (PCI). The data analysis was conducted using SPSS software.

**Result:** Sixty-one high-risk NSTEMI patients were enrolled in this study consisting of 14 (22.9%) patients receiving conservative strategy and 47 (77.0%) patients who underwent invasive procedures. There was only one death during hospitalization from the invasive group and zero death in the conservative group ( $p= 1.00$ ). The mean LOS in the hospital of the conservative group was longer than the invasive group ( $7.86 \pm 7.64$  vs  $5.36 \pm 4.37$ ), but this difference is not significant ( $p= 0.11$ ). Whereas, the mean LOS in the intensive care unit of the conservative group was shorter ( $2.00 \pm 0.55$ ) than the invasive group ( $2.77 \pm 1.33$ ) with a p-value of 0.02.

**Conclusions:** The invasive strategy does not affect in-hospital mortality in high-risk NSTEMI patients, but it can shorten their length of stay

**Keywords:** NSTEMI, invasive strategy, conservative strategy, in-hospital mortality, length of stay



RESEARCH ARTICLE

**Correlation Between Admission Estimated Glomerulus Filtration Rate (Egfr) And In-Hospital Mortality Patients Undergoing Primary Percutaneous Coronary Intervention For St-segment Elevation Myocardial Infarction**

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**Background:** Renal dysfunction is one of the major causes of in-hospital mortality in STEMI patients. In this study, we evaluated the relation between estimated glomerular filtration rate (eGFR) by CKD-EPI equation and in-hospital mortality of STEMI patients undergoing PPCI.

**Methods:** We performed a retrospective analysis of patient registry from Sardjito Cardiovascular Intensive Care (SCIENCE) between January 2021 and December 2021 with a total of 259 STEMI patients undergoing PPCI. Serum creatinine level was measured in the emergency department prior to PPCI procedure. Univariate analysis was performed to define significant factors that affected mortality; then, significant factors were subjected to a multivariate logistic regression

**Results:** The mean age of the patient was  $59.29 \pm 10.93$  years old and most of them were male (81.9%). Univariate analysis showed that higher mortality was related to age, sex, killip class, eGFR and GRACE score. Furthermore, we did multivariate analysis and showed patients with  $eGFR < 60 \text{ ml/min/1.73 m}^2$  had a significant higher in-hospital mortality compared to patients with  $eGFR \geq 60 \text{ ml/min/1.73 m}^2$  (30% vs 4.0%; OR 7.25; CI 2.21-23.80; p 0.001).

**Conclusion:** Patients with  $eGFR < 60 \text{ ml/min/1.73 m}^2$  had a significantly higher in-hospital mortality than patients with higher eGFR in STEMI patients treated with primary PCI.

**Keywords:** GFR, in hospital mortality, STEMI, Primary PCI



RESEARCH ARTICLE

**Association of Hemoglobin (Hb) and Hematocrit (Ht) level With Incidence of Acute Heart Failure and Mortality in Non ST-Segment Elevation Acute Coronary Syndrome (NSTE-ACS) Patients**

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**Background and Aims:** Hemoglobin and hematocrit level play a role that leads to the incidence of acute heart failure and also become one of the risk factors increasing mortality in acute coronary syndrome (ACS) patients. To determine the association of Hemoglobin (Hb) and Hematocrit (Ht) level With Incidence of Acute Heart Failure and Mortality in Non ST-Segment Elevation Acute Coronary Syndrome (NSTE-ACS) Patients.

**Methods:** Data of hospitalized NSTE-ACS patients at Cardiac Center in Adam Malik Hospital from Agustus-Desember 2021 were collected. Hemoglobin and Hematocrit levels of patients were acquired. Correlation analysis was done using the Mann-Whitney or Independent T-test test for continuous data. Each variable was analyzed using the SPSS.

**Results:** Eighty-five samples were acquired, about 25 patients with incidence of acute heart failure (AHF) and 17 patients death. Hemoglobin and Hematocrit levels were found lower in NSTE-ACS patients with incidence of acute heart failure. The median hemoglobin level is about 12 mg/dl in patients with an incidence of acute heart failure and about 13,35 mg/dl in patients without AHF ( $P=0,0001$ ) and the median of hematocrit level is about 35% in patients with AHF and 41% in patients without AHF ( $P=0,0001$ ). From this study, we found that NSTE-ACS patients with  $Hb < 12$  ( $P=0,023$ ;  $OR=3,143$ ;  $95\% CI=1,143-8,645$ ) and  $hematocrit < 35$  ( $P=0,006$ ;  $OR=4,333$ ;  $95\% CI=1,453-12,925$ ) tend to have an incidence of AHF. From the test, we also found that the lower level of hemoglobin ( $< 12$  mg/dl) was associated with increasing mortality of NSTE-ACS patients ( $P=0,001$ ;  $OR=6,044$ ;  $95\% CI=1,934-18,887$ ). Hematocrit level ( $< 35\%$ ) also gave the same result in increasing mortality of NSTE-ACS patients. ( $P=0,024$ ;  $OR=3,627$ ;  $95\% CI=1,135-11,590$ )

**Conclusion:** Level of hemoglobin and hematocrit become one of the risk factors that increase incidence of acute heart failure and mortality outcome in Non ST-Segment Elevation Acute Coronary Syndrome patients.

**Keywords:** Hemoglobin and Hematocrit Level, Acute Heart Failure, Acute Coronary Syndromes



RESEARCH ARTICLE

**Profile and Outcome Patients Undergoing Open Heart Surgery in Kariadi General Hospital Semarang**

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**Background and Aims:** Open heart surgery is one of means to overcome heart problems when medical therapy alone couldn't cope with. Paucity of databases that give insight into the profile and outcome of patients undergoing open heart surgery is the background of this study. We aimed to understand the profile and short term outcome of patients.

**Material and Methods:** This is a retrospective descriptive study. All adult patients underwent open heart surgery from October 2020-March 2021 were included in this study.

**Result:** A total of 102 patients underwent open heart surgery during 6 months. Most of the cases were valvular heart surgery (57%), adult congenital heart disease/ACHD (25%), and CABG (18%). Most of the patients were women (52%). Mean age of the patient population was 54 years in CABG, 45 years in VHD, and 35 years in ACHD with most common comorbid was hypertension (30%). Mean Length of stay was 13 days. The mean Aortic cross clamp (AoX) time was  $34,27 \pm 18,54$  minutes and Cardiopulmonary Bypass (CPB) time was  $48,35 \pm 21,88$  minutes. The common complications were arrhythmia (9.8%), infection (9.8%), and death (6.3%). In hospital mortality rate based on type of surgery CABG was 10%, VHD was 3% and ACHD was 8%.

**Conclusion:** Compared to western population, our patient who underwent open heart surgery was older and our mortality rate was higher, which may be caused by late onset and progression of the disease.

**Keywords :** open heart surgery, profile and outcome