# Anemia Profile in Patient with Heart Failure: Observational Study in Secondary Hospital

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**ABSTRACT**

**Background:** Anemia is frequent finding in patient with heart failure. Prevalence is varying depending population. Anemia can add stress to the heart and worsen cardiac function.

**Aim:** To investigate the profile of anemia in patients with heart failure at drSoedono Hospital Madiun

**Method:** This was a cross sectional study. Subjects of this study were 47 medical records of hospitalization patient with heart failure from 2017 to 2018 at drSoedono Hospital Madiun. Baseline characteristics and laboratory finding were collected. Subjects were divided to anemia and non-anemia. Anemia is characterized by the value of hemoglobin less than 13 g/dl in men and less than 12 g/dl in women. Data was presented in mean, median, and proportion. Statistical analyzed was used to compare between two groups, t test for numeric variable and chi square for categoric variable.

**Results:** The prevalence of anemia was 53.19%. Anemia was higher in male patient (56%). Mean age of patient with anemia was 64 years old. Forty percent patients were normocytic hypochromic, 36% were normocytic normochromic and 20% were microcytic hypochromicanemia. There was statistical significant different for creatinine levelbetween anemia and non-anemia group (p value 0.008)

**Conclusions:**Anemia is common inpatients with heart failure at drSoedono Hospital Madiun, especially normocytic hypochromicanemia.

**Keywords:** anemia; congestive heart failure; profile

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# Association Between NT-Pro BNPandQuality of Life in Atrial Septal Defect Associated Pulmonary Arterial Hypertension

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**ABSTRACT**

**Background:** N-terminal pro-brain natriuretic peptide (NT-proBNP) correlates with right ventricular dysfunction and predict survival in patients with atrial septal defect associated pulmonary arterial hypertension (ASD-PAH). With a shift in therapeutic objectives of ASD-PAH to longer-term improvements, Quality of Life (QoL) frequently became a patient-reported outcome measurement for study end-points. The relationship between patient-related outcomes, such as QoL and NT-proBNP, is not well described.

**Aims:** To assess the relationship between QOL and NT-proBNP in ASD-PAH patients

**Method:** This cross-sectional study was conducted in Sardjito Hospital Yogyakarta from July to August 2019. Thirty-eight ASD-PAH adults on stable PAH targeted therapies were enrolled in the study. All of the subjects underwent blood sample analysis for NT-proBNP, and Patient-reported outcome measurement is taken. Quality of life assessed using the Euroqol 5D-3L (EQ5D3L) questionnaire

**Result:** All subjects were included in the analysis. Subject were consist of 3 men (7.89%) and 35 women (92.11%) with age 36.53 ± 9.56 years old.The mean of NT-proBNP was 2720.17 ± 4364.67 pg/ml. and the mean of EQ5D value score and VAS Score were 0.66 ± 0.10 and 68.55 ± 13.55. Correlation analysis between NT-proBNP and QoL using Spearman's nonparametric correlation found that NT-proBNP has inversely and weak correlation with EQ5D value score ($r = -0.047$) and EQ-VAS score ($r = -0.003$) but not statistically significant ($p = 0.781$ and $p = 0.988$).

**Conclussion:** There is no reliable and statistically significant correlation between NT-proBNP and QoL.

**Keywords**: N-terminal pro-brain-type natriuretic peptide; atrial septal defect; pulmonary arterial hypertension; quality of life

# Electrocardiogram P-wave Initial Force to Estimate Pulmonary Hypertension in Adult Patient with Atrial Septal Defect

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**ABSTRACT**

**Background**:Atrial septal defect (ASD) is most common congenital heart disease (CHD) with incidence 56 per 100,000 births. One of complication is increased pulmonary blood pressure to lungs that is called pulmonary hypertension (PH). Prevalence of PH in adult patients with CHD is estimated between 1.6 to 12.5 million cases. PH in patients with CHD can increase mortality up to twofold and increase morbidity by threefold compared to congenital heart disease patients without PH. The main method used in diagnosing PH is right heart catheterization (RHC), which is only available in tertiary healthcare center. Electrocardiography is readily available in primary healthcare centers and can be used to estimate PH by using electrocardiogram P-wave Initial Force (PIF). The aim of this study is to see the specificity and sensitivity of electrocardiogram PIF to predict PH in adult patient with ASD.

**Method:** Design of this study is cross-sectional with 104 subjects taken from registry data of ASD in Cardiology and Vascular Medicine Department RSUP Dr. Sardjito, Yogyakarta. Data of heart catheterization result is used to difference ASD patient with PH and without PH. Data of electrocardiogram was taken from medical record to see whether PIF exist by multiplying the maximum amplitude of half of the initial P wave in mm with half the initial P wave duration in seconds. PIF which exceeds 0.06 mm on lead V2 and V1 indicate the possibility of PH. Collected data is analyzed using SPSS application with Chi-squareanalysis.

**Result**: There is significant difference ($p<0.05$) in PIF >0.06 mm-s on V2 lead and PIF >0.06 mm-s on V1 lead to estimate PH in adult patient with atrial septal defect, PIF also has significant difference where ASD patients with PH tend to have more right atrium enlargement compared to ASD patients without PH.

**Conclusion**: From electrocardiogram PIF on V1 lead show 80.7% on specificity and 53.8% of sensitivity to estimate PH in adult patient with ASD.

**Keyword**: electrocardiogram P-wave initial force; atrial septal defect; pulmonary hypertension**.**

# Assessment of Right Heart Failure Using Transthoracic Echocardiography after 6 Months following the Percutaneous Closure of Atrial Septal Defect in Adult

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**ABSTRACT**

**Background**: Transthoracic echocardiography (TTE) can be used for assessing right ventricle (RV) function on adult patients who undergone percutaneous closure of atrial septal defect (ASD). Right heart dysfunction due to ASD could be improved after percutaneous closure. One of transthoracic echocardiography (TTE) parameters to assess the RV function is tricuspid annular plane systolic excursion (TAPSE) and right ventricle systolic pressure (RVSP).

**Objective**: The aim of this study is to evaluate RV function using TAPSE and RVSP parameters on TTE in patients with ASD before and the sixth month after percutaneous closure.

Method: Cohort prospective study was conducted in Sardjito General Hospital. Data were collected from February 2018 to February 2019. Patients with ASD who undergone percutaneous closure were included. Measurement of TAPSE and RVSP using TTE was performed before and then the sixth month after percutaneous closure of ASD. Statistical analysis was used to estimate the difference of RV function before and after the percutaneous closure of ASD.

**Result**: Thirty five patients were included in this study. TAPSE was significantly reduced after 6 months post percutaneous closure of ASD (29.9 $\pm$ 4.67 vs 24.3 $\pm$ 4.18, 95% CI= 3.822-7.263, p=0.000). RVSP on patients who undergone percutaneous closure of ASD was also significantly reducedin the sixth month compared to RVSP before percutaneous closure
(41.07 (11-90) vs 30.79 (11-76), p=0.001).

**Conclusion**: Both of TAPSE and RVSP can be parameters of TTE to determine the improvement of right ventricle in the sixth month following percutaneous closure of ASD in adults.

**Keywords**: percutaneous closure; atrial septal defect;echocardiography; right ventricle; right ventricle function

# Correlation between NT-Pro BNPand Functional Capacity in Atrial Septal Defect Associated Pulmonary Arterial Hypertension

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## ABSTRACT

**Background:** Atrial septal defect (ASD) is congenital heart disease (CHD) with minimal symptoms even asymptomatic so it is often not diagnosed in childhood and becomes the most commonly encountered adulthood CHD in Indonesia. Uncorrected ASD will progress to pulmonary arterial hypertension (PAH). N-terminal pro-brain-type natriuretic peptide (NT-proBNP) is currently used as a surrogate marker for disease severity in pulmonary arterial hypertension (PAH). However, NT-proBNP tends to have high variability and may insufficiently correlate with hemodynamics and exercise capacity.

**Aims:** The present study is a cross-sectional study to evaluate the correlation between NT-proBNP and functional capacity in ASD-PAH patients.

**Methods:** This study was conducted in Sardjito Hospital Yogyakarta from July to August 2019. Thirty-eight ASD-PAH adult patients on stable PAH targeted therapies were randomly assigned to the study. The medication remained unchanged at least 3 months before the recruitment period.

All of the subjects underwent blood sample analysis for NT-proBNP and 6 minutes walking distance (6MWD) concomitantly.

**Results:** The study was done in 38 patients that were consist of 3 men (7.89%) and 35 women (92.11%) with age 36.53 ± 9.56 years old. The BMI was 18.58 ± 2.81 kg/m2. The mean of NT-proBNP was 2720.17 ± 4364.67 pg/ml. The mean of 6MWD was 327.16 ± 55.25 m. Correlation analysis between NT-proBNP and 6MWD using Spearman's nonparametric correlation found that NT-proBNP did not statistically significant correlate with 6MWD (p=0.120).

**Conclusion:** NT-proBNP did not correlate 6MWD in ASD-PAH patients.

**Keywords**: N-terminal pro-brain-type natriuretic peptide; atrial septal defect; pulmonary arterial hypertension; functional capacity

# Does Ivabradine Improve Clinical Outcome in Cardiogenic Shock? : A Systematic Review

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**ABSTRACT**
**Background:** Cardiogenic shock is defined as a condition of decreased blood pressure and hypoperfusion. As a compensation, tachycardia would occur, which could also happen due to side effect of inotropic drug. Even though tachycardia would maintain the cardiac output, it would also burden the heart. On the other hand, ivabradine could reduce heart rate without interrupting other mechanism.
**Aim:** The aim of this study is to understand the effect of ivabradine in improving the clinical outcome of patient with cardiogenic shock.
**Methods:** A comprehensive systematic literature was performed using Pubmed, Ebsco, Proquest, Cochrane, DOAJ, JAMA, NEJM, and BMJ. Ivabradine and cardiogenic shock were used as the search term. A systematic review of published studies was performed with PRISMA statement. Studies which had original research as design study were included. Furthermore, we identified the role of ivabradine in cardiogenic shock.
**Results:** Among 154 studies identified, five studies were included in this systematic review. Ivabradine has been known not only for reducing heart rate, NT-proBNP, pulmonary arterial occlusion pressure, and right atrial pressure, but also increasing blood pressure, LVEF, LVDF, mixed venous oxygen saturation ($SvO_2$), and stroke volume. Inotropic drugs, which are usually used in cardiogenic shock treatment, have a negative effect, including tachycardia. This effect could increase oxygen consumption, reduce systolic ejection, and impair diastolic function. Ivabradine, as an If channel inhibitor could reduce the heart rate without effecting the inotropic metabolism and cardiac output. Thus, it could decrease the negative effect from inotropic drugs and improve the outcome of the patient.
**Conclusion:** Ivabradine has been proven to bring several beneficial effects in cardiogenic shock. Therefore, it could improve the clinical status and hemodynamic. However, further studies with larger population and better method is still needed in order to understand the mechanism further.

**Keywords**: ivabradine; cardiogenic shock; inotropic

# QRS Complex Amplitude in Electrocardiogram to Estimate Pulmonary Hypertension in Adult Patient with Atrial Septal Defect

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**ABSTRACT**

**Background**: Atrial septal defect is most common congenital heart disease with incidence56per100,000births.Oneofthe complicationsisincreasedpulmonaryblood pressure to lungs that is called pulmonaryhypertension.Prevalence of pulmonary artery hypertension in adult patients with congenital heart disease is estimated between 1.6 to 12.5 million cases. Pulmonary artery hypertension in patients with congenital heart disease can increase mortality up to twofold and increase morbidity by threefold compared to congenital heart disease patients without pulmonary artery hypertension. Main method used in diagnosing pulmonary hypertension is right heart catheterization, which is only available in tertiary healthcare centers. Electrocardiography is readily available in primary healthcare centers which can be used to estimate pulmonary hypertension by using electrocardiogram QRS complex amplitude. The aim of this study is to evaluate the sensitivity and specificity electrocardiogram QRS complex amplitude to predict pulmonary hypertension in adult patient with atrial septaldefect.

**Method:**Designofthisstudycross-sectionalwith104subjectstakenfromregistry data of Atrial Septal Defect in Cardiology and Vascular Medicine Department RSUP Dr. Sardjito, Yogyakarta. Data of heart catheter result is used to differentiate atrial septal defect patient with pulmonary hypertension and without pulmonary hypertension. Data of electrocardiogram result taken from medical record to see whether CHD is present by measuring the amplitude of QRS complex in millimeterson V1 Lead. QRS complex in V1 Lead with amplitude <6mm indicates the presence of pulmonary hypertension. Collected data is analyzed using SPSS application with Chi-squareanalysis.

**Result:** There is significant difference (p<0,05) in criteria QRS amplitude < 6mm in V1 lead to estimate pulmonary hypertension in adult patient with atrial septal defect. By using QRS amplitude <6mm on V1 criteria in finding difference between right atrium enlargement in patients with pulmonary hypertension and without pulmonary hypertension, we use chi-square analysis and found significant difference (p=0.033).

**Conclusion**: From electrocardiogram QRS complex amplitude at V1 lead we have measured specificity 13.5 % and sensitivity 64.3% to estimate pulmonary hypertension in adult patient with atrial septal defect.

**Keyword**: Electrocardiogram, QRS complex, amplitude, atrial septal defect, pulmonary hypertension**.**

# Arrhythmias Occurrence in Acute Heart Failure Patients as a Predictor of Inhospital Mortality: SCIENCE Registry Sub-Study

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## ABSTRACT

**Background**: Patients with HF have an increased risk of morbidity and mortality worldwide. Commonly, patient was presented with acute heart failure (AHF) either in ER as firstly encountered or in cardiac intensive care/ward as an exacerbation one. Beside myocardial ischemia/infarct, arrhythmias could indicate the etiology or precipitant of the current episode of AHF. Prognostic implication of these two conditions, mainly inhospital death remains to beelucidated.

**Aim:** We would like to compare inhospital death between detectable arrhythmia and non-detectable arrhythmia groups in acute heart failure subsets of CVCU Sardjito Hospital patients in January-August2019.

**Method**: This is an observational, cross sectional sub-study of SCIENCE Registry that concerning in inhospital deaths among acute heart failure patients. All types of arrhythmia was documented by surface ECG and considered as dividing parameter: arrhythmia group and non-arrhythmia group.

**Result:** From 599 patients in January-August 2019. 99 admitted/treated as AHF either de novo or decompensated HF. As many as 29 patients (29.3%) were documented having arrhythmia episode. Most of them were total AV block (10 from 29 patients or 32%) followed by new onset AF (6 from 29 patients or 20.9%). We compared these two groups with crosstabs of 2x2 table implementing ChiSquare analysis with PR 1.58 (p=0.214).

**Conclusion**: Based on our registry, inhospital death of acute heart failure patients were similar among arrhythmia and non-arrhythmia group. Further research was needed to confirm this conclusion.

**Keywords**: acute heart failure; arrhythmia

# Correlation of Inhospital Mortality with Acute Heart Failure on Acute Coronary Syndrome Patients in Dr. Sardjito General Hospital

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**ABSTRACT**

**Background:** Acute heart failure (AHF) is one of complication that may occurin patients with acute coronary syndrome (ACS). AHF that developed in ACS patients increases its mortality risk.

**Aim:** To correlate incident of acute heart failure in ACS patient with inhospital mortality.

**Methods:** This cohort retrospective study was a substudy on the SCIENCE (Sardjito Cardiovascular Intensive Care) from February 2019 until August 2019, Patients that met inclusion criteria (diagnosed as ACS) were observed during hospitalization for the incidence of acute heart failure and mortality.

**Results:** Total of 397 patients diagnosed as ACS, include STEACS and NSTEACS. As many as 69 (17.38%) patients were developed AHF and 328 (82.62%) were not developed AHF. Twenty seven (39%) AHF patients were counted as inhospital mortality while mortality in non-AHF patients were 27 (8.2%). Relative risk was 4.75 (CI 2.9-7.5, $p<0.005$).

**Conclusion:** ACS patient that developed AHF have higher risk of mortality during hospitalization.

**Keywords:** acute heart failure; acute coronary syndrome; in hospital mortality

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# Water bottle sign on CXR for Quick Assess Pericardial Effusion (PE): Challenging Serial Cases for General Practitioner

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## ABSTRACT

**Introduction**: In the absent of cardiac tamponade, sign and symptoms of pericardial effusion (PE) are non-specific and maybe secondary to the etiology. This make proper diagnosis hard, especially for GP in Emergency Care (EC) when echocardiography isn't available. Untreated effusion may evolve into cardiac tamponade; thus, diagnosis is important. Chest x-ray is a standard procedure for patient with dyspnea, and when a water-bottle sign (typical appearance of large PE) is found, PE is likely. We discuss two cases where standard Chest X-Ray (CXR) can guide PE diagnosis.

**Case 1:** A 28-years-old male soldier presents with decreased exercise ability about 1 month followed by exertional dyspnea, fatigue, and night cough, sharp chest pain. He reported fever 2 weeks before. Examination revealed muffled heart sound, tachycardia. Electrocardiography (ECG) showed low-voltage QRS complexes. Lymphocytopenia, elevated monocyte, and negative troponin I was found. CXR showed enlargement of cardiac silhouette in globular-symmetric fashion (water-bottle sign). Echocardiography confirmed PE and drained 690 ml fluid. It was determined as sub-acute PE due to untreated acute pericarditis, probably related to unexplained fever. He improved with NSAID and colchicine.

**Case 2:** A 61-years-old female presents with dyspnea since several months which worsen 2 days before. She reported suprapubic pain on urination and low-grade fever. She had Heart Failure (HF) history and uncontrolled hypertension. Examination revealed bilateral basal rales, muffled heart sound, and suprapubic tenderness. ECG showed tachycardia, LAE, LVH, and inferior OMI. Leukocytosis with neutrophil domination (84%) and bacteria on urinalysis were found. The troponin I remained negative. CXR showed water-bottle sign. Echocardiography confirmed a PE and presence of fibrin strands, thus pericardiocentesis was not performed. HF medications were given alongside antibiotics. Five days later she improved.

**Discussion**: Diagnostic standard for PE is Echocardiography. However, when echocardiography is not available, standard CXR (specificity 41% and sensitivity 71%) can be used as an important modality. Water bottle sign in CXR indicates more than 250 ml of fluid in pericardial sac.

**Conclusion**: Standard CXR is an important modality for detecting PE.

# A Case Series of Peripartum Cardiomyopathy and Preeclampsia: Is It Overlapping?

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## ABSTRACT

**Background:**Preeclampsia is one of spectrum from hypertension in pregnancy and often results in heart failure. Preeclampsia is also becoming one of risk factor for peripartum cardiomyopathy (PPCM).However, the association between these conditions remains unclear.

**Case:**First case was 34 year old female referred from district hospital with severe preeclampsia presenting acute pulmonary edema in her third pregnancy (28$^{th}$ week gestational age). She complained of dyspnea, orthopnea, dry cough and hypertension one day before admission. There is no history of preeclampsia in previous pregnancy or hypertension before. She denied the history of heart failure, renal failure and also congenital heart disease. Obstetric history was also within normal limit. In physical exam, we found hypertension, tachycardia, rales and cardiomegaly with systolic murmur in the apex. Electrocardiography (ECG) showed sinus tachycardia with heart rate about 140 bpm, normoaxis. The lab exams were normal, chest x-ray showed cardiomegaly without abnormality in lungs. Echocardiography showed dilatation of left atrium (LA) and left ventricle (LV), global hypokinetic with reduced LV ejection fraction (35%), diastolic dysfunction of LV grade 1, severe mitral regurgitation due to uncoaptation. This echocardiography result confirmed the diagnosis of PPCM. The symptoms gradually improved after treated with diuretic and vasodilator. Second case, we reported 21years old female two weeks post-partum referred from another district hospital in case the patient is unable to wean the ventilator after 10 days. Patient was sent with diagnosis of acute respiratory failure because of acute pulmonary edema in severe preeclampsia and also PPCM. Patient had no risk factors of preeclampsia and PPCM. The physical exam revealed hypertension, tachycardia with minimal rales, crackles in both lungs especially in right hemithorax, no cardiomegaly and no murmurs were heard. The ECG was sinus rhythm 93 bpm, normoaxis. Lab exams did not show any significant findings except increasing level of creatinine and significant increase of procalcitonin. Chest X-ray revealed pneumonia bilateral with normal configuration of the heart. So we performed echocardiography and the result was slight LV dilatation with reduced LV systolic function (41%), diastolic dysfunction grade 1, mild regurgitation in all valves with small pericardial effusion. This echocardiography result also fit with criteria diagnosis of PPCM. We gave diuretic and uptitrate vasodilator. Patient was discharged 1 month later with stable condition,

**Conclusion:** Peripartum cardiomyopathy and preeclampsia often overlapped significantly and their risk factors are similar. In our cases, both of them had either systolic or diastolic dysfunction in echocardiography exam. Hence, echocardiography should be conducted in this condition. The pathophysiology should befurther investigatedto find out the association.

**Keywords:** peripartum cardiomyopathy; preeclampsia; pregnancy; hypertension; heart failure

# Relationship between Left Atrial Volume Index with Soluble ST2 levels in ST-elevation Myocardial Infarction Patient.

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**ABSTRACT**
**Background:** Soluble ST2 levels, a novel cardiac biomarker of mechanical strain was known for its role as a predictor for left ventricle diastolic dysfunction. Left Atrial Volume Index (LAVI) increase has been associated to left ventricle diastolic dysfunction. Early left ventricle diastolic dysfunction can be induced by myocardial overload in ST-segment elevation myocardial infarction (STEMI).
**Aims:** To investigate the relationship between solubleST2 levels with LAVI in STEMI patients.
**Methods:** We performed a cross-sectional analytic study by analyzing soluble ST2 cardiac biomarker level from STEMI patients and transthoracic echocardiography data from 33subjects that hospitalized at Sardjito General Hospital from January to July 2015. Soluble ST2 is measured by ELISA methods from peripheral veins blood samples at admission.LAVI was measured by transthoracic echocardiography, in which the volumes of the heart's chambers are measured during the cardiac cycle. STEMI is defined as acute myocardial infarction with elevation of the ST segments on the electrocardiogram followed by an increase in proteins in the blood related to heart muscle's death.
**Results:** The study was done in 29 males (87.88%) and 4 females (12.12%), with average age of 57.60 ± 10.34 years old.The mean soluble ST2 levels was752.13 ± 73.99pg/mL and median LAVI was 23 (13-46) mL/m$^2$. BySpearman's correlation test, there are no significant correlation(r = 0.074 and *p*= 0.684).
**Conclusion:** Soluble ST2 levels is not significantly related to LAVI in STEMI patients.

**Keywords:** soluble ST2; ST-elevation myocardial infarction; left atrial volume index; echocardiography.

# Potential of Anakinra (Interleukin-1 Receptor Antagonist) As a Novel Therapy For Patient with Heart Failure: A Systematic Literature Review

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**ABSTRACT**

**Background:**An enhanced inflammatory response predicts worse outcomes in heart failure (HF). Interleukin (IL)-1, a prototypical inflammatory cytokine, has been implicated as a driver of systolic and diastolic dysfunction in preclinical animal models and pilot clinical trial.

**Aim:**The aim of the current study was to determine whether IL-1 blockade with anakinra improved cardiorespiratory fitness and inflammatory response in patient with heart failure.

**Method:**A literature search was conducted using PubMed and capturing the data last 10 years. Terms used included MeSH headings for anakinra and heart failure. A systematic review of published study was performed. Article including heart failure being treated with anakinra or IL-1 blockade were included. We analyze the effect of anakinra in peak VO2, VE/VCO2, CRP plasma level, NT-proBNP and quality of life of patient with heart failure.

**Results:**In DHART2 study, treatment with Anakinra for 12 weeks showed an improvement in peak $VO_2$ from 14.5 [10.5–16.6] to 16.1 [13.2–18.6] $mL•kg^{-1}•min^{-1}$ (P=0.009)and improvement in $VE/VCO_2$ slope from 34.9 [29.4–41.4] to 31.7 [27.3–34.2](P=0.037), meanwhile it did not achieve the statistical significance set at P=0.025.CRP was diminished by a median of 66% in the 12-week anakinra group(P=0.011). In REDHART study,there is no improvement in peak VO2 and VE/VC02 (13.6 [11.8-18.0] to 14.2 [11.2–18.5] $mL\text{-}kg^{-1}\text{-}min^{-1}$, *P*=0.89 and 28.3 [27.2–33.0] to 30.5 [26.3–32.8], *P*=0.97). CRP reduced from6.1 [3.8–18.4] to 2.9 [1.2–7.8]mg/L, P=0,009 for 12 weeks.

**Conclusions:**Treatment with Anankinra improved peak VO2, VE/VCO2,CRP plasma leveland quality of life (DASI score and MLWHF) in patient with heart failure.Unfortunately, peak $Vo_2$ and $V_E/Vco_2$ slope failed to improve in a group of obese heart failure with preserved ejection fraction patients, future studies required for this population.

**Keywords:** anakinra; IL-1 blockade; IL-1 receptor antagonist; heart failure

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# Diabetic Ketoacidosis with Acute Lung Oedema: Which Therapy Should Come First? A Case Series

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## ABSTRACT

**Background:** Diabetic Ketoacidosis and Acute Lung Oedema are two conditions where each therapy contradicts one another. Therefore, the therapy of a patient presenting with Diabetic Ketoacidosis and Acute Lung Oedema is a challenging issue.

**Case Illustration:** Case 1: A 51 year old woman was brought to emergency room with decrease of consciousness since 3 hours and shortness of breath since 3 days. The patient had history of uncontrolled DM and hypertension. The patient was somnolent with kussmaul breathing and rales were found in both basal of the lung. There was no extremity edema.Random Blood Glucose was 501. From the chest x-ray there were cardiomegaly and pleural effusion. Blood gas analysis showed metabolic acidosis and ketone was positive in blood and urine. The patient was diagnosed with diabetic ketoacidosis and acute lung oedema. The patient was then treated with diuretic, insulin, and water restriction.

Case 2: A 45 year old woman was brought to emergency room with decreased consciousness since 1 hour. Patient had DM type 1 since childhood and uncontrolled hypertension. Her family said that the patient was having psychological stress since 2 days after the death of her husband. The patient was somnolent with kussmaul breathing and skin turgor was decreased. Rales were found in both basal of the lung. There was no extremity edema. Random Blood Glucose was “High”. The patient was then diagnosed with diabetic ketoacidosis and acute lung oedema and treated with rehydration of normal saline 0.9%, insulin and correction of acidosis.

Case 3: A 57 year old woman came to emergency room with shortness of breath, swelling of the extremity, and open foot wound that had not healed since 2 weeks. Patient had history of uncontrolled DM and hypertension. The patient was Compos Mentis, presented with kussmaul breathing and rales were found in both basal of the lung. There were pitting oedema in the arms and legs and also ulcer in pedissinistra. Random Blood Glucose was 604.

The patient was then diagnosed with diabetic ketoacidosis, Congestive Heart Failure, and Ulcus pedis Sinistra. The patient got therapy of furosemide 5mg/hour and also rehydration of normal saline 0.9%, insulin, and ceftriaxone.

**Discussion:** In the first case, the clinical manifestation of volume overload is more dominant. Hence the therapy is focused on decongestion by using diuretic and water restriction. On the other hand, the second caseis more dominant on osmotic dehydration and hyperglycemia. Hence, the therapy is focused on rehydration and insulin. And the third one is a case of diabetic ketoacidosis also with congestion hence the therapy is aimed at overcoming these two conditions.

**Conclusions:** The therapeutic approach for patients presented with diabetic ketoacidosis and acute lung oedemais still confusing and depends on physician’s perception and decision making. Hence a guideline which regulates this condition may be needed in the future.

**Keywords:** diabetic ketoacidosis; acute lung oedema; metabolic acidosis; volume overload

# Peripartum Cardiomyopathy: A Rare Cause of Heart Failure

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**ABSTRACT**

**Background:** Peripartum cardiomyopathy is a dilated cardiomyopathy that occurs toward the last month of pregnancy to the first 6 months postpartum, presents with heart failure (HF) secondary to impaired systolic contractile function. Early diagnosis and prompt treatment can affect patient'soutcome.

**Aim:** This study was intended to present a case series of Peripartum Cardiomyopathy describing the pattern of presentation and course of disease. The analysis was performed using SPSS 23 and descriptive statistics.

**Method:** We retrospectively reviewed 5 women who had been diagnosed with Peripartum Cardiomyopathy at RSUD Bekasi from April 2019 to July 2019. Patients received treatment according to guidelines. Data were retrieved by history taking, physical examinations, diagnostic tests, and outcome of the patients.

**Results:** In this study, the average age was 26.20 ± 3.347 years, 4/5 were primipara, preeclampsia was found in 2/5, gestational hypertension was found in 1/5. Cesarean deliveries was in 3/5, pervaginal in 1/5, and pervaginal forceps in 1/5. The average onset was 5.40 ± 4.561 weeks postpartum. Dyspnea was the chief complaint in all subjects. Total of 4/5 were NYHA functional class IV. Cardiomegaly was found in 3/5. ECG showed pathologic Q waves in 4/5. Echocardiographic parameters were tabulated (Table 1). After given HF medications, 5/5 had clinical improvements within 3 months of followup.

**Conclusions**: Majority were young primipara presenting HF postnatally and NYHA functional class IV. Earlier onset showed better echocardiographic parameters. Favorable outcomes are dependent on early diagnosis and initiation of treatment.

**Keywords:** peripartum cardiomyopathy; heart failure; dyspnea; echocardiography

**Table 1.**Echocardiography record of 5 patients

| **Echocardiographic parameters** | **Mean** |
|---|---|
| LV end-diastolic internal dimension (LVIDd) | 55.58 ± 8.1791 (43.4-64.7) mm |
| LV fractional shortening (LV FS) | 23.20 ± 12.008 (13-43) % |
| Ejection fraction (EF) | 39.0 ± 16.462 (20-62) % |

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# The Overview of Length of Stay and Heart Failure Patient Profile in Balangan Regional Hospital Year 2018

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**ABSTRACT**

**Background:** Heart failure is a global health problem with high morbidity and mortality rates and is associated with the long period length of stay.

**Objective:** To find out the demographic characteristic and clinical characteristic as well as length of stay of health failure patients treated in Balangan Regional Hospital year 2018.

**Methods:** This study used a cross-sectional study design using secondary data from medical records of heart failure patients in Balangan Regional Hospital year 2018. The data obtained were then descriptively analyzed to be presented afterwards.

**Results:** There were 139 data of health failure patients that were treated in Balangan Regional Hospital in 2018. The highest age range was over 45 years by 87%. Around 52% were women. The most common complaint was shortness of breath (77.6%). At the beginning of treatment, the median systolic blood pressure was 140 mmHg, pulse rate 98 times per minute and respiratory rate 26 times per minute. Peripheral edema occurred in 32% of patients, rales in 45%, and 86% patients had cardiomegaly as well as left ventricular enlargement of ECG by 73%. The most common comorbid werepulmonary disease (41%) followed by hypertension (30.9%), impaired kidney function (28%),ischemic heart disease (24.4%), diabetes mellitus (18.7%), anemia (15.8%) and arrhythmias (12.9%). The most used drug was statin (76.9%). The median length of stay was 5 days.

**Conclusion:** The length of stay median of health failure patients in Balangan Regional Hospital is 5 days. The majority of patients are women, over 45 years old, and pulmonary disease was the most common co morbid.

**Keywords:** length of stay; health failure; clinical profile

# Relationship Between Time of Ischemia and Global Longitudinal Strain (GLS) of Left Ventricle in Patients with ST-Segment Elevation Myocardial Infarction (STEMI) who were Successfully Reperfused

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**ABSTRACT**

**Background**: Coronary heart disease (CHD) is a problem that contributes to morbidity and mortality. Acute myocardial infarction with ST-Segment Elevation Myocardial Infarction (STEMI) is the most common manifestation of CHD. Cardiac muscle damage caused by STEMI is dynamic. The longer the coronary is occluded, the greater the area of infarction will be due to biomechanical changes in the myocardium. Speckle Tracking Echocardiography (STE) through longitudinal strain parameter is a technique of assessing myocardial deformation and predicting the infarct area immediately after reperfusion therapy.

**Method**: This study was an analytic observational study with a cross-sectional method. Subjects were STEMI patients who were successfully reperfused and fulfilled the inclusion and exclusion criteria. Transthoracic echocardiography was performed within 12 hours after reperfusion. Strain analysis was done offline at the work station. A normality test was performed to determine the type of correlation test used. The influence of confounding factors was analyzed by bivariate and multivariate. A value of $p < 0.05$ was said to be statistically significant.

**Results**: There were 43 subjects, ischemia time and GLS were obtained. A normality test using Shapiro Wilkrevealedthat data distribution of the two variables were abnormal. The Spearman correlation test was used to assess the relationship between the two variables and found a positive correlation between the time of ischemia and GLS ($r = 0.546$; $p = 0.000$). Bivariate and multivariate analyses were performed to assess the influence of confounding factors. From the multivariate test, it was found that ischemia time was an independent factor influencing GLS value ($p = 0.002$).

**Conclusion**: There is a positive correlation between ischemia time and left ventricular GLS in STEMI patients who were successfully reperfused ($r = 0.546$; $p = 0.000$).

**Keywords**: acute myocardial infarction; infarction area; global longitudinal strain

# Does Omeprazole Induce Arrhythmia?: A Systematic Review

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**ABSTRACT**

**Background:** Omeprazole is widely administered, especially in patients with gastrointestinal disorder. In some cases, this drug is used for a long period to manage various conditions. On the other hand, omeprazole has been limited in patients with heart disease. The long-term use of omeprazole would lead to several side effects, such as arrhythmia.

**Aim:** The objective of this study is to review the effect of omeprazole in arrhythmia event.

**Methods:** A systematic literature was performed using Pubmed, BMJ, NEJM, JAMA, Cochrane, Ebsco, DOAJ, JAMA, NEJM, and BMJ which focused on studies within the last five years. The search terms were omeprazole and arrhythmia. A systematic review of studies was performed with PRISMA statement. Studies which had original research as design study were included.

**Results:** The initial search identified 74 articles and four articles were included after screening. Overall, omeprazole might induce arrhythmia event by reducing magnesium absorption. Two case reports indicated prolonged QT interval on ECG which is caused by hypomagnesaemia related with the long-term use of omeprazole. While the cohort study showed serum magnesium concentrations were significantly lower in PPI users than in PPI non-users. RCT study demonstrated that administration of omeprazole in mice with myocardial infarction had significantly worsened ventricular arrhythmia. The malabsorption of magnesium could happen as the impairment of TRPM6 and TRPM7 function due to the lack of proton in small intestine. It also has been susceptible that this malabsorption is associated with TRPM6 mutations, which is often accompanied by hypocalcaemia. Thus, those disturbances could lead to cardiac arrhythmia.

**Conclusion:** The long term of consumption omeprazole could decrease magnesium, which probably occurring arrhythmia. However, further studies to explore the direct relation between omeprazole and arrhythmia are still needed as the exact mechanism of omeprazole-inducing hypomagnesaemia and arrhythmias was not fully understood.

**Keywords**: Omeprazole; arrhythmia; PPI; hypomagnesaemia; hypocalcaemia

# Revealing the Clinical Profile of Acute Heart Failure Patients in RSUD Kota Madiun

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**ABSTRACT**
**Background:**Heart failure is a global health issue with high morbidity and mortality but there is limited information about theclinical profile inrural area, including Madiun, Indonesia.
**Aim:**This study aimed to reveal the clinical profile of acute heart failure patients in RSUD Kota Madiun.
**Method:**This is a descriptive study on 100 patients with symptoms of acute heart failure admitted from January 2017 to December 2018 at RSUD Kota Madiun, Indonesia, which was assessed using Swedish Heart Failure registry**.**
**Results:** From 100 patients with New York Heart Association (NYHA)class II-IV, over half (59%) were male and 44% were smoker. Mean age was 63 ± 13 years. Hypertension and ischemic heart disease were common etiologies accounting for 55% and 15% of cases respectively. The majority of patients had at least one co-morbidity, the most prevalent being hypertension (66%), anemia (36%), myocardial infarct (31%), type-2 diabetes mellitus (32%), chronic kidney disease (25%), and atrial fibrillation (21%). Most of patients were prescribed diuretics (97%), 18% angiotensin-converting enzyme inhibitors, 29% angiotensin receptor blockers, 61% beta-blockers, and 74% mineralocorticoid receptor blockers. The median length of stay (LOS) was 6.2 days and thehospital mortality rate was 17%. The mortality rate was higher in male and at least one co-morbidity (p=0.032, p=0.026, respectively): 53% hypertension, 47% diabetes mellitus, 41% anemia, and 29% chronic kidney disease.Compared to the previous heart failure study in Indonesia (Siswanto, 2010), we also found that hypertension was the leading cause of heart failure, the LOS was shorter, and the hospital mortality was higher.
**Conclusions:**Hypertension was the leading cause of heart failure in RSUD Kota Madiun. The higher hospital mortality needs careful attention of the diagnosis and management of acute heart failure and its co-morbidities.

**Keywords:** acute heart failure; co-morbidities; mortality

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# Functional Capacity in Heart Failure and Ischemic Heart Disease: A Comparison of Percutaneous Coronary Interventionversus Pharmacotherapy Alone

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## ABSTRACT

**Background:** Percutaneous coronary intervention (PCI) is one of the main modalities for coronary revascularization which is done to improve symptoms and reduce mortality in patients with Ischemic Heart Disease (IHD). A number of studies state that PCI influences patient outcomes such as mortality, hospital readmission, and physical function.The patients' physical activity was influenced by functional capacity that can be assessed with 6-minute walk test (6-MWT).

**Aim:** To find out whether there are differences in functional capacity between HF and IHD patients undergoing PCI and pharmacotherapy alone.

**Method:** A cross-sectional study was conducted at Dr. SardjitoGovernment General Hospital in January-July2019. The study subjects were 38 IHD patients consisting of 17 PCI patients and 20 non-PCI patients. Patients were asked to do a 6-minute walk test (6MWT) for functional capacity assessment. Results from 6MWT were used to calculate the Metabolic Equation Tasks (METs) in patients. The research data were then analyzed by independent t-test.

**Results:** The subjects of this study consisted of 33 male subjects and 4 female subjects, with mean age of 60 years old for PCI group and 57 years old for pharmacotherapygroup.There was no significant difference between hypertension risk factor on PCI group compared to pharmacotherapygroup ($p>0.05$). Eleven out of 17 patients from PCI group suffer from hypertension and 12 out of 20 patients from pharmacotherapygroup suffer from hypertension. There was a significant difference between DM risk factor on PCI group compared to pharmacotherapygroup ($p<0.005$). Two out of 17 patients from PCI group suffer from DM meanwhile from group pharmacotherapythere are 8 out of 20 patients suffer from DM. There was no significant difference between dyslipidemia risk factor on both groups ($p>0.005$). Eight patients on group PCI suffer from dyslipidemia while 10 patients from group pharmacotherapysuffer from dyslipidemia. The ejection fraction on both groups had no significant difference ($p>0.005$) with the mean of PCI group is 42.25±11.28 and the mean of pharmacotherapygroup is 45.71±16.35.

From the analysis, there were no significant differences between METs in patients undergoing PCI compared with pharmacotherapypatients ($p> 0.005$) with an average METs of PCI patients being 2.60 ± 0.48 and the average METs of pharmacotherapy patients 2.61 ± 0.57.

**Conclusions:** There was no significant difference in functional capacity between HF and IHD patients undergoing PCI and pharmacotherapy alone.

**Keywords:** functional capacity;ischemic heart disease; METs; percutaneous coronary intervention

# Dyspnea among Adult Ventricular Septal Defect in Sardjito General Hospital Yogyakarta: Heart Failure or Pulmonary Hypertension?

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**ABSTRACT**

**Background:** Ventricular septal defect (VSD) is defined as defect in the septum between the right and left ventricle which allows oxygen-rich blood to flow from the left ventricle into the right ventricle. VSD is the most common congenital heart defect in the newborn and could persist until adult. VSD could develop heart failure because left side of the heart pumps blood into the right ventricle in addition to its normal work of pumping blood to the body. VSD could also cause pulmonary hypertension (PH). Increased blood flow to lungs due to the VSD causes high blood pressure in the lung arteries and damages them.

**Aim:** This study aimed to describe the changes of hemodynamics in patients with dyspnea among adult VSD in Sardjito General Hospital Yogyakarta.

**Method:** This study was an observational descriptive study based on VSD registry from 2017 until 2019 in Sardjito General Hospital Yogyakarta. The inclusion criterias are adult VSD patients with symptoms of dyspnea who were recorded under adult VSD registry in Sardjito General Hospital Yogyakarta. Patients without complaints of dyspnea were excluded. Hemodynamics datas were taken from echocardiography and right heart catheterization procedures.

**Results:** From total 51 adults VSD patients complaining of dyspnea, 31 (61%) of them were female and the rest were male (39%) with the mean age of 30.31± 11.56 years old. We found that 51% of VSD were perimembranous, 26% were doubly committed subarterial and 23% were others types. However these patients mostly had EF above 50% (94%). Others who had EF 40-50% was around 2% and EF<40% was around 4%. Furthermore 79% of these patients have PH varied severities from mild until severe and 21% did not have PH.

**Conclusions:** Most of adult VSD patients with dyspnea had preserved EF. However most of them had PH ranged from mild until severe.

**Keywords:** dyspneu; adult VSD; PH; heart failure; ejection fraction