Low Hemoglobin Level as a Predictor of Acute Heart Failure in Hospitalized Patients with Myocardial Infarction (Insight from the SCIENCE Registry)

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ABSTRACT

Background: Low hemoglobin levels in patients with STEMI and NSTEMI have progressive cardiovascular mortality and heart failure. Low hemoglobin levels can cause frequent comorbidities in acute heart failure with relevant clinical implications, regardless of the degree of left ventricular systolic dysfunction and decrease in systolic blood pressure. Low hemoglobin levels can reduce oxygen delivery to the myocardium downstream of coronary stenosis increase myocardial demand by requiring higher stroke volume and heart rate to maintain adequate systemic oxygen delivery and this combination process can explain the progressive results of myocardial patients who are getting worse with lower hemoglobin levels. The identification and optimal management of low hemoglobin level during hospitalization will be important in patients with ADHF to reduce mortality.
Objectives: To explore difference between the hemoglobin level in myocardial infarction with acute heart failure and non acute heart failure
Methods: This study is a cross sectional study. Subject of the study was STEMI and NSTEMI patients from the SCIENCE registry of DR Sardjito General Hospital. Hemoglobin level variable from two group (AHF dan non AHF) will be analyzed using t test.
Results: 581 patients were included in this study. The hemoglobin level mean was lower in AHF group (12,51) compared to non-AHF group (13,01). Mean difference between two group is statistically significant. (t = -2.0934, OR= 1.114 , p = 0.0367).
Conclusions: Haemoglobin level could be prediction marker of acute heart failure occurence in myocardial infarction patient. Further analysis is needed to adapt this finding in real clinical setting.

Keywords : hemoglobin; acute heart failure; myocardial infarction

Association between Estimated Glomerular Filtration Rate with Left Ventricular Remodeling in Patients with Heart Failure Preserved Ejection Fraction

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ABSTRACT

Aims: It has been recognized that heart failure and renal dysfunction are a decrimental combination. Multiple studies have shown that renal dysfunction in heart failure patients was associated with increase of mortality. Renal dysfunction is a common comorbidity in patients with heart failure preserved ejection fraction (HFpEF). We want to investigate the relationship between eGFR and echocardiography finding of LV remodeling in patients with HFpEF.

Methods: We studied 1370 participants from Heart Failure Registry of Sardjito Hospital from January 2016 until August 2019. From that registry, 245 patients was HfpEF (left ventricular ejection fraction (LVEF) > 50%). All participants had echocardiography examination and kidney function measurement. The estimated glomerular filtration rate (eGFR) was measured by the CKD-EPI (Chronic Kidney Disease Epidemiology Collaboration) equation. Correlation analysis was used to characterize the association between echocardiographic parameter of LV and estimated GFR.

Results: The mean age of the study population was 58 years, 65% were man, 55% hypertensive, and 17% diabetic. Impairment of kidney function (eGFR<60 ml/min/1.73 m²) was present in 37% patients. The estimated glomerular filtration rate (eGFR) was significantly associated with interventricular septal thickness at end-diastole (IVSd) with r -0.230 and p value 0.000, but not significantly correlated with Left ventricular Internal Diameter end-diastole (LVIDd) with r -0.065 and p value 0.311, Left ventricular Internal Diameter end-sistole (LVIDs) with r -0.063 and p value 0.333, Left ventricullar Mass Index (LVMI) with r -0.104 and p value 0.142 and Relative Wall Thickness (RWT) with r -0.122 and p value 0.084.

Conclusion: An eGFR was not significantly correlated with LV remodeling in heart failure preserved ejection fraction patients.

Prognostic Value of Health Related Quality of Live in Patients with Heart Failure: A Systematic Literature Review

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ABSTRACT
Background: Heart failure (HF) is associated with high mortality, comparable to the rates of various malignancies, and the 5-year mortality is almost 50%. Research on HF is currently focusing on improvement in survival and health related quality of life (HRQOL)
Aim: To know whether HRQOL is a predictor and an independent predictor of long-term cardiac mortality, all-cause mortality, and HF-related re-hospitalization.
Method: A literature search was conducted using PubMed and capturing the data last 10 years under the keywords: HRQOL, heart failure, and mortality rate. A systematic review of published studies was performed.
Results: We identified 4 studies that were included in the review. In a Serbia study reported that poor HRQOL was an independent predictor of cardiac mortality (HR: 2.051, 95% CI: 1.260-3.339, P = 0.004), all-cause mortality (HR: 1.620, 95% CI: 1.076-2.438, P = 0.021), and HF-related re-hospitalization (HR: 2.040, 95% CI: 1.290-3.227, P = 0.002). In a study conducted in Japan reported that poor HRQOL was significantly associated with increased risks of cardiac events (HR: 1.02, 95%, 95% CI: 1.001-1.05, P = 0.038) and of all-cause death (HR: 1.04, 95% CI: 1.02-1.07, P = 0.001). A study of African-American HF patients in USA reported that poor HRQOL were associated with a higher risk for combined all-cause mortality or HF hospitalization (baseline P < 0.0001, change at 3 months P = 0.001, and at 6 months P = 0.0008). A study in UK reported that CHF patients with poor HRQOL were at increased risk of repeat hospitalization (HR: 6.0, 95% CI: 3.3–10.0, P = 0.001).
Conclusions: HRQOL is an independent predictor of long-term cardiac mortality, all-cause mortality, and HF-related re-hospitalization in patients with HF. HRQOL could be used as a complementary clinical predictive tool.

Keywords: heart failure; HRQOL; prognosis; mortality; hospitalization

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Early Systolic and Diastolic Function Changes in Breast Cancer After Cancer Chemotherapy: A preliminary study

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ABSTRACT

Introduction. Anthracycline affects various cell lines, which may contribute to left ventricular (LV) dysfunction and vascular remodeling. Asymptomatic diastolic dysfunction with preserved left ventricular ejection fraction is suspected to precede late cardiac event in cancer survivors treated by chemotherapy. Our aim was to evaluate changes in LV systolic and diastolic function in breast cancer patients early after anthracycline chemotherapy.

Method. Thirty women (age 52 ± 10 years old) with breast cancer scheduled for standard chemotherapy were enrolled in the study. This analytical, observational cohort study comprised of 23 consecutive patients receiving anthracycline-based chemotherapy and 7 patients receiving non-anthracycline chemotherapy for breast cancer. All patient underwent clinical evaluation and echocardiogram at the beginning as a baseline and at the end of anthracycline-based chemotherapy as a comparison. Examinations were performed at the baseline and at the end of the last dose of chemotherapy. LV systolic and diastolic functions were assessed by LV ejection fraction (LVEF), E/A, deceleration time, e lateral, e medial, E/e'.

Result. None of the patients revealed any cardiovascular symptoms during follow-up. At the end of chemotherapy, 1 patient (3.33%) who received anthracycline-based chemotherapy developed diastolic dysfunction. LV systolic function remained normal, but significant decrease of LVEF in anthracycline-based chemotherapy group at the end of chemotherapy (72.56±5.84 % vs. 69.47±5.34 %, p=0.007) was found. No significant difference in diastolic parameter for both groups, except for deceleration time, where it got shortened in the anthracycline-based chemotherapy group (191.87±36.2 vs 168.17±44.6, p=0,021).

Conclusion. Our study showed that standard dose anthracycline chemotherapy is associated with reduced LVEF and shortened deceleration time, regardless of the preserved global systolic and diastolic function. There was 3,33% patient developed diastolic dysfunction at the end of chemotherapy for the anthracycline-based chemotherapy group.

Keywords: cardiotoxicity; anthracycline; breast cancer; LV dysfunction

Predictors of One-year Mortality in Chronic Heart Failure Patients: Study from Sardjito General Hospital Heart Failure Registry

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ABSTRACT

Background: Chronic heart failure (CHF) patients experience high rates of poor outcome, especially in developed countries. Risk assessment provides information about patients prognosis and may help in identifying which patients are in need of more intense monitoring and therapy. This study aims to search for the most consistent independent predictor of mortality in CHF patients.

Method: A one-year prospective cohort study was conducted in Sardjito General Hospital from 1 January 2016 to 31 July 2018. The day of the last follow-up was 31 July 2019. Multivariable models were developed using baseline candidates variables to predict all-cause of one-year mortality included age, gender, risk factors, and echocardiography of CHF patients.

Result: Of 1044 CHF patients enrolled, there were predominantly male with 717 (68.7%) subjects and only 327 (31.3%) female. The mean age of this study population was 58.33±13 years old. There were 193 patients died during one-year follow up. The strong predictors of one-year mortality in CHF patients are hypertension (p=0.172), dyslipidemia (p=0.024), low EF (p=0.006), and patients with pulmonary hypertension (p=0.067). Based on multivariate analysis, we found LVEF < 40% is an independent predictor for all-cause mortality in heart failure patients during one-year follow up (HR = 1.591 95% CI = 1.153-2.195; p = 0.005). Surprisingly, dyslipidemia is a protective factor of mortality in our population (HR = 0.676; 95% CI = 0.470-0.972; p = 0.035).

Conclusion: In chronic heart failure patients, low EF is a predictor for one-year mortality.

Keywords: chronic heart failure; one year mortality; EF

Downregulation of MIR-21-5p Promotes Heart Failure: An In Silico Analysis

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ABSTRACT

Background: Heart failure is type of cardiovascular disease that contribute to disease burden and healthcare expenditure upon modern society. Recently, many in vitro and in vivo studies found the involvement of microRNAs in various cardiovascular diseases include heart failure. MiRNAs are small non-coding RNA molecules that regulate gene expression by binding to mRNA-translation and induce inhibition/degradation of the target gene. Prefiously found reveal that miR-21-5p are reduce in heart failure patient compare to normal patient.

Aim: The aim of this study is to analyze role of miR-21-5p in the incidence of cardiac dysfunction by In Silico analysis.

Method: In this study we used the computational tools *miRTarBASE* and *StarmiRDB* to determine the target gene regulated of miR-21-5p which results heart failure.

Results: In this study, we found that miR-21-5p was predicted to recognize and bind to the PTEN and EGFR genes in the nucleotide base positions 1290-1303 and 2495-2510 (Log.Prob 0.7737 and 0.821 and ΔG_{total} -9.875 and -10, 76). Other strongest binding potentials were found in each base into 1990-2013 and 577-598 (MFE = -6.90 and -15.6 and scores = 135 and 139). Decreased expression of miR-21-5p that occurs in patients with heart failure causes a decrease in their ability to inhibit the expression of PTEN (Phosphatase and Tension homologous) and EGFR (Epidermal Growth Factor Receptor) genes and initiate worsening of heart failure.

Conclusions: The conclusion of this study is that decreased miR-21-5p expression can promote the occurrence of heart failure by controlling the expression of PTEN and EGFR genes.

Keywords: heart failure; microRNA; miR-21-5p; PTEN; EGFR.