



**Indonesian Journal of
Cardiology**

Indonesian J Cardiol 2024;45:suppl_A
pISSN: 2830-3105 / eISSN: 2964-7304
doi: 10.30701/ijc.1720



SYSTEMATIC REVIEW & META-ANALYSIS

**META-ANALYSIS ON THE ROLE OF ACETAZOLAMIDE AS AN ADJUNCT TO LOOP
 DIURETICS IN ACHIEVING RAPID DECONGESTION AND ALTERATION OF RENAL
 FUNCTION IN HEART FAILURE: INSIGHTS FROM RANDOMIZED CONTROLLED TRIALS**

C. A. N. Tanumihardja¹, N. L. P. Y. Dewi¹

¹Kalabahi Public Hospital, Alor

Background:

In heart failure management, effective decongestion remains a primary therapeutic target. This meta-analysis evaluates the role of acetazolamide, a diuretic enhancer, as an adjunct to loop diuretics, focusing on its impact on decongestion and alteration of renal function.

Methods:

This meta-analysis aligns with the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analysis) guidelines. Comprehensive searches were conducted in databases including PubMed, ScienceDirect, Wiley Online, CENTRAL, and Google Scholar, covering literature up to December 2023. Randomized controlled trials evaluating the efficacy of acetazolamide as an add-on therapy to loop diuretics in adult patients with heart failure were eligible for inclusion. The primary outcome measured were decongestion day 3 and worsening of renal function.

Results:

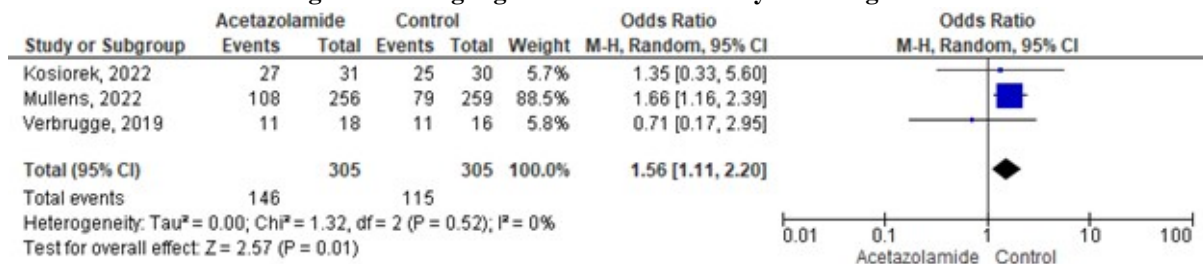
Our analysis included four trials with a total of 318 participants. We found that the addition of acetazolamide to loop diuretics in heart failure patients led to a significant improvement in day 3 decongestion, with an odds ratio (OR) of 1.56 (95% CI 1.11 to 2.20). Additionally, a notable increase in natriuresis was observed, indicated by a mean difference (MD) of 70.5 (95% CI 13.97 to 127.11). However, this treatment regimen did not significantly affect worsening renal function (OR 2.48, 95% CI 0.38 to 16.05) or all-cause mortality (OR 1.47, 95% CI 0.85 to 2.53). These findings suggest that acetazolamide, as an adjunct to loop diuretics, significantly enhances decongestion and natriuresis without detrimentally impacting renal function.

Conclusion:

This meta-analysis demonstrates that acetazolamide, as an adjunct to loop diuretics, significantly enhances day 3 decongestion and natriuresis in heart failure patients without adversely impacting renal function. These findings underscore the potential of acetazolamide in optimizing decongestive therapy in this patient population, offering a promising approach to heart failure management. Its limited effect on mortality underscores the urgent needed for further research in heart failure treatments.

Keywords: renal function, heart failure, decongestion, Acetazolamide

Figure Showing Significant Result for Day 3 Decongestion



TETRALOGY OF FALLOT INTERVENTION STRATEGIES: A META-ANALYSIS OF COMPLETE VERSUS STAGED REPAIR

D. D. C. H. Rampengan¹, S. C. Surya², E. Willyanto³, R. N. Ramadhan⁴, F. A. Gunawan¹, A. H. Alamsyah⁵

¹Bachelor Study Program of Medicine, Faculty of Medicine, Universitas Sam Ratulangi, Manado, Indonesia

²Bachelor Study Program of Medicine, Faculty of Medicine, Universitas Udayana, Bali, Indonesia

³Bachelor Study Program of Medicine, Faculty of Medicine, Universitas Brawijaya, Malang, Indonesia

⁴Bachelor Study Program of Medicine, Faculty of Medicine, Universitas Airlangga, Surabaya, Indonesia

⁵Department of Cardiology and Vascular Medicine, Medical Faculty of Udayana University/Prof. I.G.N.G Ngoerah General Hospital, Bali, Indonesia

Background:

Tetralogy of Fallot (TOF) is observed in around 3 to 5 out of every 10,000 live births and stands as the primary cause of death from cyanotic congenital heart disease. Generally, asymptomatic patients undergo elective surgical repair within the first year of life. Conversely, symptomatic patients marked by severe cyanosis require a neonatal procedure, involving a choice between complete repair and staged repair. Despite extensive experience with surgical repairs for TOF, the debate on the preferred approach persists, particularly in developing nations where delayed diagnosis and resource constraints pose significant challenges. Thus, this study was conducted to compare and evaluate the peri- and post-operative outcomes of patients with ToF undergoing complete or staged repair.

Methods:

The meta-analysis was carried out through a systematic exploration of five databases (PubMed, ScienceDirect, EBSCO, Cochrane, and ProQuest) up to December 2023. Quality appraisal was done using NOS, while meta-analysis used RevMan 5.4

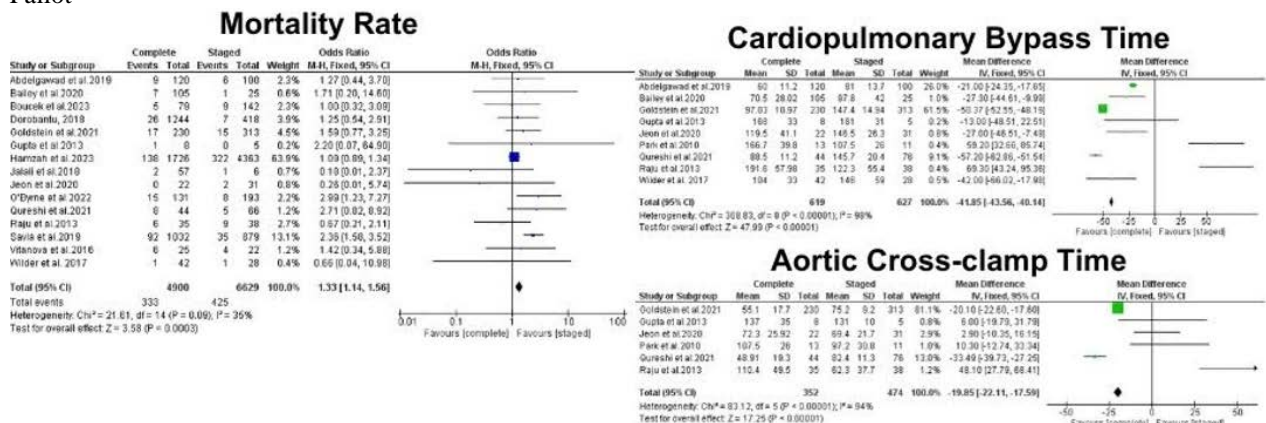
Results:

The literature search resulted in the selection of 16 articles for analysis. Quality assessment categorized ten studies as low-risk and six others as high-risk of bias studies. Quantitative analysis revealed that complete repair is superior in minimizing reoperation rates [OR=0.90; p=0.30], homograft aortic valve replacement rates [OR=0.56; p<0.0001], cardiopulmonary bypass time [MD=-41.85; p<0.00001], aortic cross-clamp time [MD=-19.85; p<0.00001], and post-operative arrhythmia events [OR=0.76; p=0.006]. Conversely, staged repair demonstrated greater efficacy in limiting mortality rates [OR=1.33; p=0.0003], transannular patch intervention rates [OR=1.47; p<0.00001], lengths of hospital and intensive care unit stays [SMD=0.64; p<0.00001 and MD=1.40; p<0.00001], requirements for mechanical ventilation [MD=1.40; p<0.00001], post-operative extracorporeal membrane oxygenation rates [OR=1.12; p=0.20], and post-operative pacemaker implantation rates [OR=4.39; p<0.00001].

Conclusion:

Both complete and staged repair procedures exhibited superiority in minimizing various peri- and post-operative outcomes. Determining the optimal surgical approach for TOF should be personalized for each patient, considering their preferences.

Keywords: complete repair, peri-operative outcomes, post-operative outcomes., staged repair, Tetralogy of Fallot



SIGNIFICANT ECG PARAMETER IN STEMI PATIENTS LEAD TO LEFT VENTRICULAR SYSTOLIC DYSFUNCTION: A META ANALYSIS

F. R. Agfata¹, B. K. K. F. T. Seran¹, F. W. Nugroho²

¹RS PKU Muhammadiyah Fastabiq Sehat

²Department of Cardiology and Vascular Disease, RS PKU Muhammadiyah Fastabiq Sehat

Background:

Left ventricular systolic dysfunction (LVSD) is a well-recognized marker of unfavorable prognosis in post MI patients. Echocardiography is needed to diagnose LVSD, but the availability in primary healthcare is still limited. Meanwhile, electrocardiography (ECG) are available widely, yet there was no guidance to assess LVSD in STEMI patients using ECG. This study aim to find significant ECG parameters of STEMI patients which leads to occurrence of LVSD.

Methods:

Systematic review based on PRISMA 2020. Studies searched on MEDLINE/PubMed, ScienceDirect, and COCHRANE databases, period of 2000-2003 for studies assessing ECG parameters of STEMI patients which leads to LVSD. Three authors independently assessed the trials for inclusion and extracted data, risk of bias using COCHRANE RoB. Heterogeneity counted using I2 method. Meta analysis performed using RevMan v5.4 with Inverse Variant method to determine Standard Mean Difference (SMD).

Results:

The final analysis including 7 trials, with a total of 1634 subjects. When STEMI first occurred, patients who presented with LVSD after 6 months of follow-up showed a significant ECG parameters, including higher heart rate (mean of 84.23bpm; SMD -0.70; 95%CI -0.92 to -0.40; p<0.001), longer QRS duration (mean of 102.12ms; SMD: -0.46; 95%CI -0.58 to -0.32; p<0.001), more lead with ST-Elevation (mean of 5.25 leads; SMD -1.08; 95%CI -1.28 to -0.99; p<0.001), and higher sum of ST-Elevation (mean of 1.79mV; SMD -1.41; 95%CI -1.70 to -1.13; p<0.001). In post-PCI ECG assessment, patients with LVSD showed a significant ECG parameters including longer QRS duration (mean of 101.01ms; SMD -0.80; 95%CI -1.03 to -0.56; p<0.001) and more lead with ST-Elevation (mean of 4.5 leads; SMD -1.25; 95%CI -1.49 to -1.00; p<0.001).

Conclusion:

Longer QRS duration and more lead with ST-Elevation (numSTE) are significant as predictor of LVSD after 6 month follow-up in STEMI patients; both measured when STEMI occurred and post-PCI.

Keywords: Electrocardiography, Left Ventricular Systolic Dysfunction, ECG, Meta Analysis, STEMI

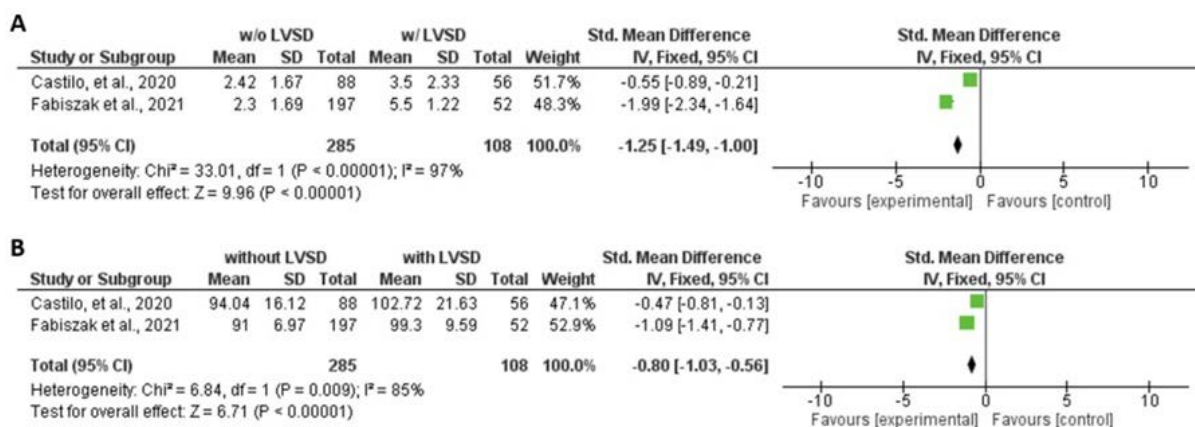


Fig. 2 Forest plots for the ECG parameters (A) number of leads with ST Elevation and (B) QRS duration, in patients with acute coronary syndrome. without LVSD (Left Ventral Septum Disorder) and with LVSD. measured post-PCI.

COMPARATIVE EFFICACY AND SAFETY OF LEVOSIMENDAN, MILRINONE, AND DOBUTAMINE IN PATIENTS WITH ACUTE RIGHT HEART FAILURE: A SYSTEMATIC REVIEW AND NETWORK META-ANALYSIS

F. M. Aldian¹, Visuddho¹, B. S. Witarto¹, C. D. K. Wungu², H. Susilo³, A. K. R. Purba⁴, M. Y. Alsagaff⁵

¹Fakultas Kedokteran Universitas Airlangga

²Departemen Ilmu Faal dan Biokimia Kedokteran, Universitas Airlangga

³Departemen Kardiologi dan Kedokteran Vaskular Fakultas Kedokteran Universitas Airlangga - Rumah Sakit Universitas Airlangga

⁴Departemen Anatomi, Histologi, & Farmakologi, Fakultas Kedokteran Universitas Airlangga.

⁵Departemen Kardiologi dan Kedokteran Vaskular Fakultas Kedokteran Universitas Airlangga - Rumah Sakit Universitas Airlangga

Background:

Acute right heart failure (ARHF) stands as a complex cardiovascular disease linked to a high global mortality rate. Currently, there are no therapies designed specifically to address right ventricle (RV) damage, which serves as the most critical predictor of mortality in ARHF. Levosimendan, milrinone, and dobutamine are frequently used inodilator drugs with potential effects on RV damage. Thus, this study aimed to explore the efficacy and safety of levosimendan, milrinone, and dobutamine-existing inodilator drugs with the potential to enhance RV conditions in ARHF patients.

Methods:

This network meta-analysis were conducted based on the PRISMA Network Meta-Analysis Checklist of Items. A systematic search was conducted in PubMed, CENTRAL, Scopus, Web of Science, ProQuest, CINAHL, MedRxiv, and BioRxiv up to July 31, 2023 (PROSPERO CRD42022303597). Data analyses were performed using Rstudio v.4.3.1, MetaInsight v.5.1, CINeMA, and GeMTC in both pairwise and frequentist network meta-analyses with random-effects model. Surface under the cumulative ranking curve (SUCRA) values were estimated to present the ranking of each treatment in the network and confidence of the results of each network meta-analysis were assessed using GRADE approach.

Results:

This study included a total of 1875 subjects from 35 randomized controlled trials. The analysis showed that levosimendan was superior in 5 outcomes—reducing mean pulmonary artery pressure (mPAP) (pooled MD = -5.91; 95% CI = -9.26 to -2.56; SUCRA = 89.24), pulmonary arterial systolic pressure (PASP) (-9.75; -20.14 to 0.65; 77.3), pulmonary vascular resistance (PVR) (-17.77; -72.64 to 37.11; 80.41), pulmonary capillary wedge pressure (PCWP) (-3.45; -6.88 to -0.22; 81.82) and improving right ventricular ejection fraction (RVEF) (9.63; -7.96 to 27.21; 76.23). Dobutamine was found to be superior in improving tricuspid annular plane systolic excursion (TAPSE) (11.86; 10.97 to 12.75; 91.56), and milrinone was found to be superior in reducing right atrial pressure (RAP) (-4.13; -10.52 to 2.25; 86.3) and had better safety measures (pooled OR = 0.58; 95% CI = 0.21 to 1.62; SUCRA = 76.63). The meta-regression and inconsistency analyses showed no possible effect modifiers in the network meta-analysis.

Conclusion:

Levosimendan demonstrated greater efficacy in treating ARHF patients, while milrinone exhibited a higher level of safety.

Keywords: levosimendan, milrinone, acute right heart failure, dobutamine

ARTIFICIAL INTELLIGENCE-GUIDANCE IN ECHOCARDIOGRAPHY DIAGNOSIS FOR CARDIOVASCULAR DISEASE PATIENTS: A SYSTEMATIC REVIEW

B. E. Sitepu¹, N. F. B. Butar¹, K. Modesty¹, A. Probandari²

¹Undergraduate Medical Student Programme, Faculty of Medicine, Universitas Sebelas Maret

²Department of Public Health, Faculty of Medicine, Universitas Sebelas Maret

Background:

Cardiovascular diseases (CVDs) are the leading causes of death globally. Various types of tests can be done to diagnose CVDs accurately and quickly, one of them is using echocardiography. Echocardiography was used to rule out the possibility from many etiologies especially for the management of patients with chest pain with absence of radiation and low costs. However, the traditional way in diagnosing echocardiography was time-consuming, high subjectivity, and not standardized. The use of technology called artificial intelligence as one of the solutions has become an alternative for more accurate and faster diagnosis of echocardiography.

Methods:

We conducted a systematic review to provide the use of artificial intelligence in helping the diagnosis of echocardiography to CVDs patients. According to PRISMA guidelines, we searched randomized controlled trials from two databases, PubMed and ProQuest. We selected articles published from 2013 to 2023. The PICO included cardiovascular disease patients (population), artificial intelligence in echocardiography (intervention), experts (comparison), and accuracy of diagnosis (outcome).

Results:

The primary search returned 435 articles, of which 6 RCTs met inclusion criteria. This review critically analyzed the specificity and sensitivity of diagnosing echocardiography results with artificial intelligence compared to experts or other testing data. We synthesized four studies that analyzed the detection of cardiovascular disease by using AI-based echocardiography and showed high sensitivity and specificity with high AUC value. Other two studies also obtained significant results by using AI-based echocardiography compared to sonographer and to develop the prediction model for ejection fraction (EF). Beside that, EF below 40% indicated inadequate blood pumps and its percentage could be well-detected by AI-based echocardiography.

Conclusion:

AI-based echocardiography proved to be one of the most potential methods to establish the diagnosis in heart disease. It has high sensitivity and specificity to detect heart disease by predicting the EF itself. The method used in AI-based echocardiography is proven to be more effective in diagnosing people with heart disease than others. Further studies should be conducted in wider populations to imply this AI globally.

Keywords: cardiovascular disease, artificial intelligence, machine learning, echocardiography

ENHANCING OUTCOMES: A SYSTEMATIC LITERATURE REVIEW AND META-ANALYSIS OF GOAL-DIRECTED THERAPY IN CARDIAC SURGERY

L. D. Pradipta¹, I. P. Farissa¹, A. Alamsyaputra¹, S. Sungkar¹

¹RSUP Dr. Kariadi, Semarang / Faculty of Medicine Universitas Diponegoro, Semarang

Background:

In recent years, there has been a decline in the postoperative mortality rate following cardiac surgery; nonetheless, the postoperative morbidity rate continues to be significant. Although there is evidence that perioperative goal-directed haemodynamic treatment (GDT) may reduce surgical mortality and morbidity in patients undergoing non-cardiac surgery, the findings regarding its effectiveness in patients undergoing cardiac surgery are less clear. This study's goal is to conduct a meta-analysis on the clinical impact and postoperative complications of GDT in patients who have undergone cardiac surgery.

Methods:

We searched for relevant studies in Pubmed, Scopus, ScienceDirect, and ProQuest. The inclusion criteria were pre-emptive haemodynamic intervention, mortality, complications, and cardiac surgery populations. Studies that included were reviewed in their entirety and subjected to quantitative analysis. Regardless the heterogeneity, random-effects model was utilized in order to produce a synthesis of the data through the utilization of odds ratios (OR) and mean differences (MD) for continuous data in conjunction with 95% confidence intervals (CI).

Results:

From 222 potential studies, 10 met all the inclusion criteria (3373 patients). The quantitative analysis showed that the use of GDT reduced: the duration of mechanical ventilation (MD -1.49, 95% CI -2.51 – -0.48; $p = 0.004$), hospital length of stay (MD -1.15, 95% CI -1.61 – -0.68; $p < 0.0001$), ICU length of stay (MD -0.16, 95% CI -0.31 – -0.01; $p = 0.03$), and in hospital mortality (OR 0.63, 95% CI 0.41 – 0.96; $p = 0.03$). The used of GDT also reduced postoperative complications such as: acute kidney injury (OR 0.66, 95% CI 0.53 – 0.82; $p = 0.0002$) and cerebrovascular accident (OR 0.53, 95% CI 0.29 – 0.9; $p = 0.04$).

Conclusion:

The use of GDT in cardiac surgery reduces mortality, length of stay, duration of mechanical ventilation, and postoperative complications.

Keywords: goal directed therapy, cardiac surgery, haemodynamic

EFFICACY OF MECHANICAL CIRCULATORY SUPPORT IN PATIENT WITH CARDIOGENIC SHOCK SECONDARY TO ACUTE MYOCARDIAL INFARCTION – A NETWORK META-ANALYSIS OF RANDOMIZED CONTROLLED TRIALS

L. D. Pradipta¹, I. P. Farissa¹, A. Alamsyaputra¹, S. Sungkar¹

¹RSUP Dr. Kariadi, Semarang / Faculty of Medicine Universitas Diponegoro, Semarang

Background:

Cardiogenic shock secondary to acute myocardial infarction (AMI-CS) is associated with poor survival rate. Mechanical circulatory support (MCS) devices have been developed to improve the survival rate. Intra-aortic balloon pump (IABP) has been routinely utilized for decades, however, current guidelines suggests that IABP is not routinely advised for patients with AMI-CS. Prior research indicated that IABP did not enhance the survival of patients with AMI-CS when compared to pharmacotherapy. Therefore, patients with AMI-CS required more potent MCS options including percutaneous MCS (pMCS) (Impella or Tandem Heart) and extra corporeal membrane oxygenation (ECMO) to improve their survival rate. As a result, we performed this network meta-analysis to assess which is the most optimized therapy to improve survival for patients with AMI-CS.

Methods:

A search was conducted using various online databases, including PubMed, Scopus, ScienceDirect, and ProQuest, to locate randomized controlled trials (RCTs) that were written in English and published before January 2024. The Cochrane Handbook was used to assess the quality of each trials and risk of bias. Network meta-analysis was utilized to examine the effectiveness of various treatments (pharmacotherapy, IABP, pMCS, and ECMO) for patients with AMI-CS. The analyses were conducted using “netmeta” package of RStudio v2023.12.1 software.

Results:

Initial screening yielded 750 studies, 13 RCTs involving 1851 patients with AMI-CS. Six studies (n= 1145) compared the IABP with pharmacotherapy, four studies (n= 514) compared the Impella with IABP, two studies (n= 159) compared the ECMO with pharmacotherapy, and one studies (n= 33) compared the Tandem Heart with IABP. In-hospital or 30-day mortality occurred in 29.17% overall, including 11.94% who received MCS and 12.75% who received pharmacotherapy (pooled RR 1.13, 95%CI 0.98 – 1.3). None of the RCTs demonstrated statistically significant difference in mortality between two groups. This network meta-analysis showed that MCS devices were not associated with lower mortality compared to any other MCS device or pharmacotherapy. There was no publication bias (Egger’s test p= 0.53) and all trials included in this study have good quality assessment.

Conclusion:

None of the mechanical circulatory support devices could reduce mortality in patient with cardiogenic shock secondary to acute myocardial infarction.

Keywords: acute myocardial infarction, mechanical circulatory support, cardiogenic shock

Quality Assessment of each trial, forest plot, network graph, funnel plot, and PRISMA of this study

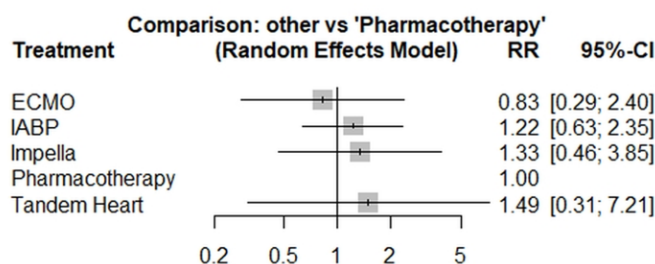


Figure 2. Relative risk (RR) values of each MCS compared to pharmacotherapy from the network meta-analysis

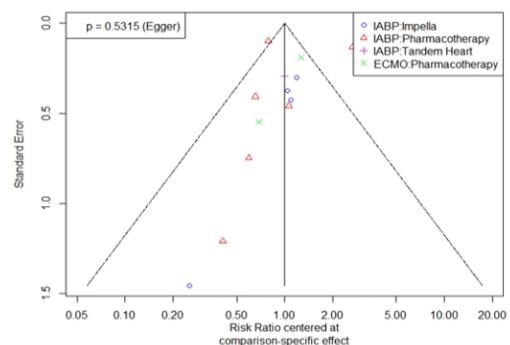


Figure 4. Funnel plot of this network meta-analysis

EFFECTIVENESS OF LUNG RECRUITMENT MANEUVER AFTER CORONARY ARTERY BYPASS SURGERY – A META-ANALYSIS OF RANDOMIZED CONTROLLED TRIALS

L. D. Pradipta¹, I. P. Farissa¹, A. Alamsyaputra¹, S. Sungkar¹

¹RSUP Dr. Kariadi, Semarang / Faculty of Medicine Universitas Diponegoro, Semarang

Background:

Coronary artery bypass surgery (CABG) is a common procedure performed in patient with coronary artery disease. Patients undergoing CABG often experience postoperative complications such as atelectasis and respiratory disturbances, which could worsen the clinical outcomes. In an effort to prevent such complication, methods aimed at recruiting potentially collapsed lung areas, such as Lung Recruitment Maneuver (LRM), have been a subject of research. LRM involves the application of brief positive pressure to open alveoli that may collapse during breathing. However, the effectiveness of LRM in improving CABG outcome remains controversial, with available randomized controlled studies providing varied results. Therefore, this study aims to conduct a meta-analysis of existing randomized controlled trial outcomes to comprehensively investigate the effectiveness of RM in enhancing postoperative recovery in CABG patients.

Methods:

A search was conducted using various online databases, including PubMed, Scopus, ScienceDirect, and ProQuest, to locate randomized controlled trials (RCTs) that were written in English and published before December 2023. The RCTs examined how LRM could improve clinical outcome in patient undergoing isolated CABG surgery. Independently, two reviewers extracted data and evaluated the quality of the trials. Meta-analysis was performed using Review Manager 5.4 software.

Results:

We reviewed 11 RCTs involving 993 patients undergoing isolated CABG surgery. Patients receiving LRM had a reduced incidence of pulmonary atelectasis (group with recruited pressure >30 mmHg: risk ratio (RR) 0.31; 95%CI 0.13 – 0.76, p= 0.01; group with recruited pressure <30 mmHg: RR 0.54; 95%CI 0.33 – 0.89, p= 0.02), reduced incidence of pneumonia (RR 0.35; 95%CI 0.16 – 0.78, p= 0.01), and improved PaO₂/FiO₂ ratio (mean difference (MD) 52.88; 95%CI 31.36 – 74.39, p< 0.001) without altering the cardiac index (MD 0.32; 95%CI -0.48 to 1.11, p= 0.43) or mean arterial pressure (MD -0.72; 95%CI -3.75 to 2.31, p= 0.64) as compared with patient who treated by using conventional ventilation. The incidence of pneumothorax was not statistically significant between two groups (p= 0.61).

Conclusion:

Lung recruitment maneuver may reduce postoperative pulmonary atelectasis, pneumonia, and improve PaO₂/FiO₂ ratio without altering hemodynamic profile in patients undergoing isolated CABG surgery.

Keywords: coronary bypass surgery, lung complication, lung recruitment maneuver

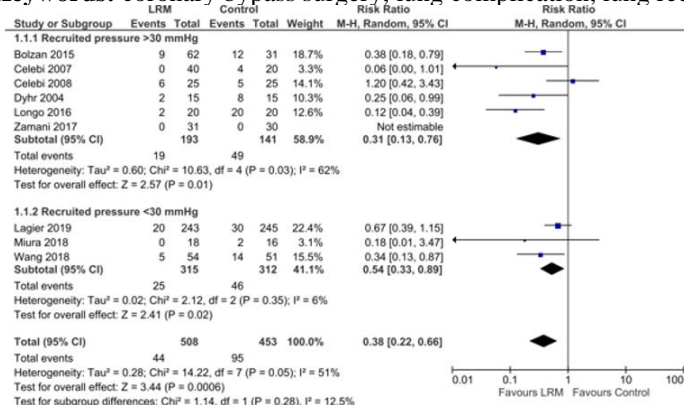


Figure 2. Incidence of pulmonary atelectasis between LRM vs control

CONUNDRUM OF SEQUENTIAL NEPHRON BLOCKADE: A SYSTEMATIC REVIEW AND META-ANALYSIS OF DIURETIC COMBINATION THERAPY IN ACUTE DECOMPENSATED HEART FAILURE

N. P. T. Labi¹, D. D. C. H. Rampengan¹, S. H. Rampengan²

¹Faculty of Medicine Sam Ratulangi University/Prof. Dr. R. D. Kandou General Hospital, Manado North Sulawesi, Indonesia

²Department of Cardiology and Vascular Medicine, Faculty of Medicine Sam Ratulangi University/Prof. Dr. R. D. Kandou General Hospital, Manado North Sulawesi, Indonesia

Background:

Acute decompensated heart failure (ADHF) often manifests with congestion, a prevalent symptom managed through intravenous loop diuretics. Nonetheless, extended usage of these medications may induce resistance, necessitating a sequential nephron blockade strategy involving the addition of other diuretic groups. The efficacy and safety implications of this combined approach remain relatively underexplored in the literature.

Methods:

We conducted a systematic search across PubMed, Embase, and Cochrane databases to identify randomized controlled trials comparing patients with acute decompensated heart failure (ADHF) receiving only loop diuretics versus those receiving adjunct combination therapy (thiazide, acetazolamide, and tolvaptan). The efficacy outcomes of interest included (1) weight change, (2) diuresis (defined as 24-hour urine output [L]), (3) decongestion (reduced edema and relieved dyspnea), (4) length of hospital stay, (5) 30-day heart failure hospitalization, and (6) All-cause mortality. Safety implications were assessed in form of (1) hypokalemia events, and (2) worsening of kidney function. We utilized random-effects model for data synthesis. Statistical analyses were performed using Review Manager 5.4.

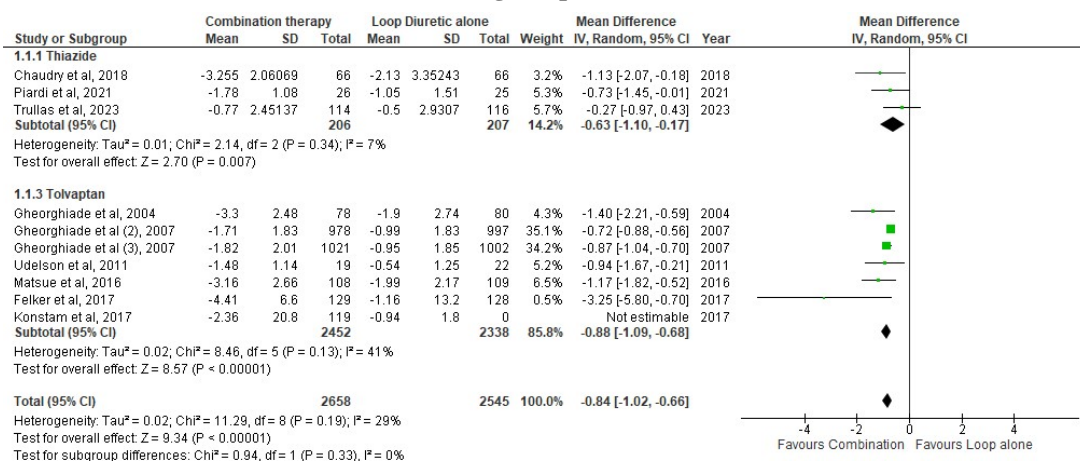
Results:

Pooled analysis exhibit 20 RCTs involving 5,962 patients with ADHF, 2,983 received a diuretic combination therapy, while 2,979 were treated with loop diuretic monotherapy. The analysis revealed that individuals receiving the diuretic combination experienced a greater degree of weight loss (mean difference -0.84 kg; 95% CI -1.02, -0.66; $p < 0.00001$; $I^2 = 0.29$), more substantial diuresis (mean difference 1.24 L; 95% CI 0.44, 2.05; $p = 0.002$; $I^2 = 0.88$), and better decongestion (Odds ratio 1.34; 95% CI 1.12, 1.60; $p = 0.001$; $I^2 = 0.25$). However, diuretic combination therapy also exhibited a higher incidence of hypokalemia (Odds ratio 3.36; 95% CI 1.92, 5.90; $p < 0.0001$; $I^2 = 0.00$) compared to those receiving loop diuretic alone. No significant difference was observed between the two groups regarding length of hospital stay, 30-day rehospitalization, all-cause mortality or worsening of kidney function.

Conclusion:

The results indicate that the sequential nephron blockade by diuretic combination therapy may effectively beneficial in patients with ADHF. However, the impact of diuretic combination therapy on hard clinical outcomes stay remains uncertain. Further research is needed to elucidate the potential benefits and risks associated with this treatment approach in ADHF patients.

Keywords: Acute decompensated heart failure, Diuretic combination therapy, Loop diuretic
Forest plot of diuretic combination therapy compared to loop diuretic monotherapy regarding the weight change response.



DUAL GIP AND GLP-1 RA AGENT (TIRZEPATIDE) ROLE IN IMPROVING CARDIOVASCULAR OUTCOMES OF DIABETIC PATIENTS AFTER CORONARY PROCEDURES

R. M. Javier¹, G. Y. Caecarma², F. Gani², D. D. Deria², R. Trimaulidia², F. Deantari², F. Farabi², J. I. Hutasoit²,
F. R. Tua², R. N. Putra²

¹RSUPN dr. Cipto Mangunkusumo

²RSPAD dr. Gatot Soebroto

Background:

Tirzepatide, a novel dual glucose-dependent insulinotropic polypeptide (GIP) and glucagon-like peptide-1 (GLP-1) receptor agonist, represents a significant advancement in the treatment of type 2 diabetes (T2D) and obesity[1,2]. This research focuses on the specific application of tirzepatide in improving cardiovascular outcomes in diabetic patients post-coronary procedures, addressing the gap in existing studies regarding its cardiovascular benefits[3,4].

Methods:

Employing a systematic review approach, this research synthesizes existing clinical trials and studies to assess tirzepatide's effectiveness in improving cardiovascular outcomes. The analysis focuses on comparative studies of tirzepatide against other GLP-1 receptor agonists and its direct effects on cardiovascular risk factors[9,10].

Results:

The study is predicated on the exigency to evaluate tirzepatide's role beyond glycemic control, specifically its impact on cardiovascular outcomes in T2D patients who have undergone coronary interventions. This exploration is crucial for identifying comprehensive treatment modalities that address both diabetes and its cardiovascular complications[7,8].

Conclusion:

The findings indicate that tirzepatide, through its dual action on GIP and GLP-1 receptors, not only enhances glycemic control and promotes weight loss but also exhibits potential in reducing cardiovascular risk in T2D patients[11,12]. These outcomes underscore tirzepatide's role as a promising therapeutic agent in the integrated management of diabetes and its associated cardiovascular risks[4,8].

Keywords: Diabetic Patients, Cardiovascular Risk, Tirzepatide

CARDIOVASCULAR OUTCOME RELATED BETA-BLOCKER WITHDRAWAL IN PATIENTS AFTER HOSPITALIZATION RELATED HEART FAILURE

F. R. Tua¹, R. M. Javier², F. Gani¹, G. Y. Caecarma¹, F. Deantri¹, R. Trimaulidia¹, D. D. Deria⁴, F. Farabi¹, F. Farabi¹, J. I. Hutasoit¹, R. N. Putra¹

¹ RSPAD dr. Gatot Soebroto

² RSUPN dr. Cipto Mangunkusumo

Background:

Beta-blockers play a critical role in managing heart failure (HF) and atrial fibrillation (AF), enhancing survival and reducing hospitalizations[1,2]. This systematic review investigates the consequences of beta-blocker withdrawal in patients after hospitalization for heart failure, addressing a significant gap in the management of cardiovascular diseases.

Methods:

A systematic review methodology was employed to analyze data from randomized controlled trials, observational cohort studies, and meta-analyses focusing on the impact of beta-blocker withdrawal on cardiovascular outcomes and mortality in heart failure patients[7,8].

Results:

Beta-blockers, along with ACE inhibitors and aldosterone antagonists, have been shown to be crucial in heart failure treatment, especially in reducing the risk of cardiovascular death or hospitalization in patients with reduced ejection fraction[4]. However, the specific outcomes of beta-blocker discontinuation in critical illness and acute heart failure have yet to be thoroughly explored[5].

Conclusion:

Preliminary findings emphasize the importance of continuous beta-blocker therapy post-hospitalization to maintain cardiovascular stability and reduce mortality risk, underlining the necessity for guidelines on medication management for transitioning patients[9].

Keywords: Heart Failure, Beta blocker, Cardiovascular Disease

EVALUATING THE EFFICACY AND SAFETY OF EARLY INITIATION OF NOVEL ORAL ANTICOAGULANTS IN POST-STROKE ATRIAL FIBRILLATION PATIENTS: A META-ANALYSIS

R. N. Ramadhan¹, D. D. C. H. Rampengan², S. E. Willyanto³, S. E. Willyanto³, I. M. D. R. Puling³, F. M. Aldian¹

¹Faculty of Medicine, Universitas Airlangga

²Faculty of Medicine, Universitas Sam Ratulangi

³Faculty of Medicine, Universitas Brawijaya

Background:

Cardioembolic stroke is mostly caused by atrial fibrillation (AF). Even beyond the hyperacute post-stroke phase, patients with AF are susceptible to early recurrent ischemic stroke (RS). Anticoagulants work by interrupting blood clot formation and thereby are impactful in AF treatment. However, the best time to start anticoagulation after an ischemic stroke is still up for debate. Anticoagulation in acute stroke patients has been shown in prior trials to decrease early stroke recurrence rates. On the contrary, an equal rise in the likelihood of symptomatic hemorrhagic transformation (HT) is also found. In stroke patients without AF, early anticoagulant usage is linked to a higher incidence of HT. However, other research suggests no net benefit to early anticoagulation following a stroke. Objectives: This study aims to assess the efficacy and safety of early initiation of novel oral anticoagulants (NOACs) in post-stroke AF patients.

Methods:

The study focused on assessing the efficacy through analyzing occurrences of ischemic stroke, recurrent stroke, and mortality rates. Additionally, safety was assessed by analyzing events of intracerebral hemorrhagic (ICH) stroke and symptomatic intracerebral HT. The study employed RoB 2.0 for quality assessment and conducted a meta-analysis using RevMan 5.4.

Results:

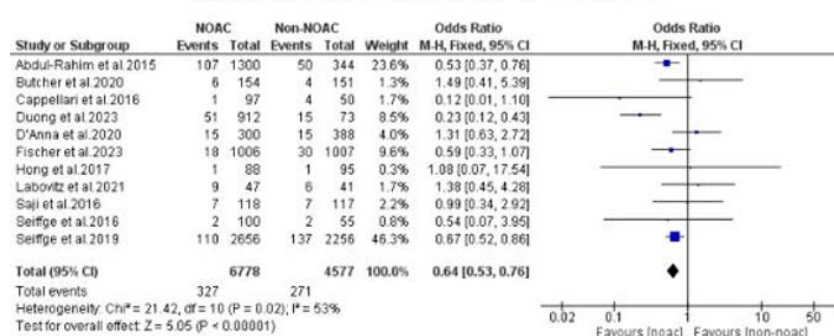
A literature search across five databases resulted in the selection of 21 articles for analysis. Quality assessment categorized 19 studies as low-risk and two as high-risk of bias studies. The assessment of efficacy revealed a statistically significant decrease in the occurrence of recurrent stroke and mortality with NOACs [OR = 0.64; p < 0.00001 and OR = 0.41; p < 0.00001]. However, the NOACs group exhibited a higher frequency of ischemic stroke events compared to the control group, although the result was not statistically significant [odds ratio (OR) = 1.28; p = 0.37]. Regarding safety, the evaluation indicated a lower incidence of ICH stroke and symptomatic intracerebral HT side effects with NOACs [OR = 0.47; p < 0.00001 and OR = 0.42; p = 0.0008]. Furthermore, funnel plot analysis revealed no publication bias between studies.

Conclusion:

Early initiation of NOACs successfully demonstrated efficacy and safety in post-stroke AF patients, supporting their recommendation for use in clinical settings.

Keywords: atrial fibrillation, efficacy, novel oral anticoagulants, post-stroke, safety

Recurrent Stroke Events NOAC vs Non-NOAC



IN-DEPTH ANALYSIS OF EXTRACORPOREAL MEMBRANE OXYGENATION FOR CARDIOGENIC SHOCK: A SYSTEMATIC REVIEW AND META-ANALYSIS

S. P. Nababan¹, D. D. C. H. Rampengan¹, I. M. D. R. Puling², S. E. Willyanto², A. D. Pratama³, K. C. Tjandra⁴, R. N. Ramadhan⁵

- ¹Bachelor Study Program of Medicine, Faculty of Medicine, Universitas Sam Ratulangi, Manado, Indonesia
- ²Bachelor Study Program of Medicine, Faculty of Medicine, Universitas Brawijaya, Malang, Indonesia
- ³Bachelor Study Program of Medicine, Faculty of Medicine, Universitas Atma Jaya, Jakarta, Indonesia
- ⁴Bachelor Study Program of Medicine, Faculty of Medicine, Universitas Diponegoro, Semarang, Indonesia
- ⁵Bachelor Study Program of Medicine, Faculty of Medicine, Universitas Airlangga, Surabaya, Indonesia

Background:

Around 10% of patients with acute myocardial infarction (MI) experience cardiogenic shock (CGS), a complication that leads to morbidity and mortality. When left and/or right ventricular failure prevents oxygen adequacy, a short-term mechanical circulatory support (MCS) device called venoarterial extracorporeal membrane oxygenation (VA-ECMO) may provide extra oxygen delivery. This device gives time for revascularization, reperfusion, and restoration of hemodynamic stability to maintain organ perfusion. Extensive retrospective investigations have proven their effectiveness. However, there are still disagreements regarding the effects of VA-ECMO, particularly the increase in costs and resource utilization. Consequently, additional data is required to reevaluate its effectiveness. Thus, this study was conducted to assess and compare the results of patients with cardiogenic shock who receive VA-ECMO or control therapy.

Methods:

The primary objective of the study was to evaluate the survival rate, mortality rate, adverse events rate, and resuscitated cardiac arrest events of patients receiving VA-ECMO and ECMO + Impella for cardiogenic shock. Quality appraisal was done using RoB 2.0, while meta-analysis used RevMan 5.4.

Results:

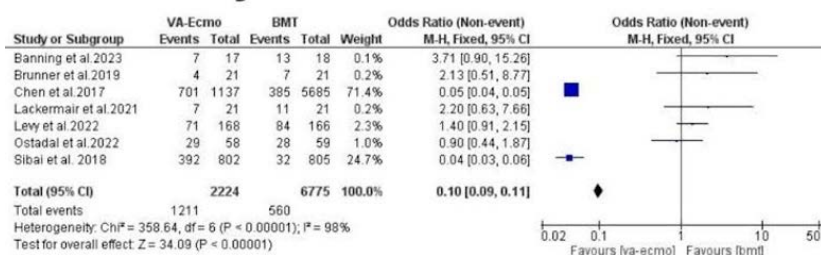
A literature search across 4 databases resulted in the selection of 10 articles for analysis with quality assessment categorized 8 studies as low-risk and 2 as high-risk of bias studies. Quantitative analysis demonstrated that VA-ECMO significantly increased survival rate [OR=9.88; P<0.00001] and reduced mortality rate [OR=0.10; P<0.00001]. However, it has non-statistically significant overall results revealing no difference between both groups for adverse events rate [OR=1.03, P=0.94] and resuscitated cardiac arrest events [OR =1.36; P=0.59]. Alternatively, patients who were administered ECMO+Impella, subgroup analysis showed a non-statistically significant overall result favoring the control group [OR=4.57; P=0.009] for survival rate and favored the ECMO+Impella [OR=0.18; P=0.007] for mortality rate.

Conclusion:

When used to improve outcomes for patients enduring cardiogenic shock, VA-ECMO is a safe and effective treatment. It is important to conduct further research on VA-ECMO or its combination treatment, particularly by including follow-up studies to evaluate any adverse events.

Keywords: cardiogenic shock, intervention, venoarterial extracorporeal membrane oxygenation, mechanical circulatory support

Mortality Rate VA-ECMO vs BMT



FINDING THE BEST TIME TO REPAIR THE TETRALOGY OF FALLOT: A META-ANALYSIS OF EARLY VERSUS LATER COMPLETE REPAIR

S. C. Surya¹, D. D. C. H. Rampengan², S. E. Willyanto³, R. N. Ramadhan⁴, B. G. de Liyis¹, A. H. Alamsyah⁵

¹Bachelor Study Program of Medicine, Faculty of Medicine, Udayana University

²Bachelor Study Program of Medicine, Faculty of Medicine, Sam Ratulangi University

³Bachelor Study Program of Medicine, Faculty of Medicine, Brawijaya University

⁴Bachelor Study Program of Medicine, Faculty of Medicine, Airlangga University

⁵Department of Cardiology and Vascular Medicine, Medical Faculty of Udayana University Prof. I.G.N.G Ngoerah General Hospital

Background:

Tetralogy of Fallot (TOF), the most prevalent cyanotic congenital heart anomaly, impacts around 3.9 in 10,000 live births. The primary objectives of repair involve mitigating intracardiac shunting and the right ventricular outflow tract (RVOT) obstruction. Despite historical success in surgery, a contentious controversy continues concerning the ideal timing to repair the defect completely. Numerous studies have aimed to settle these debates, but consistent results have yet to be observed. This study aims to provide an updated comparison regarding the outcomes of TOF patients undergoing complete repair during the neonatal and non-neonatal periods.

Methods:

Literature searching was conducted across databases, including PubMed, ScienceDirect, and Epistemikos. Quality assessment was done using the NOS scale, while the outcomes were analyzed using RevMan 5.4. The study assessed the perioperative and postoperative outcomes, length of intensive care unit (ICU) and hospital stays.

Results:

Nineteen studies were eligible for inclusion in the analysis. The neonatal repair exhibited longer ICU stays [SMD 1.58; 95%CI 1.04, 2.12; $p < 0.00001$] and hospital stays [SMD 5.18; 95%CI 3.54, 6.82; $p < 0.00001$]. Further analysis also revealed that neonatal repair produced lower odds of conduit use [OR 0.53; 95%CI 0.39, 0.71; $p < 0.00001$]. Regarding post-procedural outcomes, the analysis showed an overall result favoring the non-neonatal repair, including transannular patch intervention [OR 2.82; 95%CI 2.20, 3.61; $p < 0.00001$], mortality rate [OR 1.68; 95%CI= 1.47, 1.92; $p < 0.00001$], ECMO [OR 1.92; 95%CI 1.28, 2.86; $p < 0.002$], delayed chest closure [OR 2.52; 95%CI 2.06, 3.09; $p < 0.00001$] cardiac catheterization [OR 2.45; 95%CI 2.04, 2.94; $p < 0.00001$], and pacemaker implantation [OR 3.68; 95%CI 2.89, 4.70; $p < 0.00001$].

Conclusion:

This study suggests that complete repair at a non-neonatal period yielded better postoperative outcomes, shorter hospital stay, ICU stay, and ventilation time. This approach appears more practical for managing TOF in daily practice. Randomized studies with adequate follow-up and controlled samples were necessary to validate our findings.

Keywords: congenital heart disease, complete repair, neonatal, Tetralogy of Fallot, infant

THE ROLE OF PLATELET-LYMPHOCYTE RATIO AS PREDICTOR OF IN-HOSPITAL MORTALITY IN ACUTE HEART FAILURE PATIENTS: A SYSTEMATIC REVIEW

Sulastr¹, G.I. Abishanata¹

¹Soekarno General Hospital

Background:

Platelet-to-lymphocyte ratio (PLR) are inflammatory markers used as prognostic factors in various diseases. In heart failure (HF) patients, platelets and lymphocytes are both influenced as well as actively participating in the bidirectional relationship. The platelet to lymphocyte ratio (PLR) could therefore be a marker of severity. This review aimed to assess the role of PLR in HF.

Methods:

The relevant studies were screened in PubMed/Medline, Cochrane Library, Scopus, and Sage Journals databases with specific keywords until February 2024. Relevant articles that evaluated PLR as a predictor of in-hospital mortality in AHF patients were included. Two authors independently carried out the study eligibility assessment, extraction data, and study quality assessment.

Results:

In total, 7 articles (n = 2,860) were selected. The total mean age was 67.4±11.8 years. The mean PLR was 165.54 [95% confidence interval (CI): 154.69–176.38]. In total, 6 articles (n = 2,326) reported in-hospital mortality (PLR: 192.83, 95% CI: 150.06–235.61), and the mean PLR was 166.68 (95% CI: 154.87–178.50). Further analysis revealed PLR was significantly higher in non-survivors AHF patients than survivors group (152.34, 95% CI: 134.01–170.68 versus 194.73, 95% CI: 175.60–213.85, standard mean difference: -0.592, 95% CI: -0.857 to -0.326, p < 0.001).

Conclusion:

The study showed an association between high PLR and in-hospital mortality in patients with AHF. PLR may be used as a predictor for in-hospital mortality in patients with AHF.

Keywords: PLR, acute heart failure, prognosis, platelet-lymphocyte ratio, in-hospital mortality

**THE USAGE OF LOW DOPAMINE STRATEGY IN ACUTE HEART FAILURE : IS IT USEFUL? A
META ANALYSIS OF RANDOMIZED CONTROLLED TRIALS**

T. Lukitawening¹, A. S. Siagian², J. A. Trixie³

¹RSUD dr Haryoto

²RSUD Talisayan

³Universitas Indonesia

Background:

Low dose Dopamine is used in acute heart failure treatment to enhance diuresis and protect renal function. The Low dose dopamine has been used in the past decades to improve renal outcome in acute heart failure due to its ability to improve the renal blood flow and induce intrarenal vasodilation. The objective of this study is to assess the usage of low dopamine on renal function in acute heart failure

Methods:

The study design in this paper is meta analysis. All Randomized Controlled Trials (RCT) about the low dose dopamine and heart failure were identified in medical databases such as Pubmed and Cochrene. The trials involved in this study range from 2010-2023. The relevant trials were examined and each study obtained was subjected to critical appraisal. The outcomes in each trial are in the numeric scale (Mean and SD). The outcomes in our study are Total urine output in 24 hours, the creatinine level, and the eGFR as the reflection of renal function and congestion end point. Mean differences (MD) and 95% Confidence Interval (CI) were calculated using the random fixed effect model.

Results:

Five RCT involving 471 patients were included in this study. This study showed that control group is better than treatment group in enhance diuresis in heart failure (MD = 0.9; CI 95% 0.45 - 1.42; p = 0.00). Also, control group is better than treatment group in eGFR (MD = 0.40; CI 95% 0.06 - 0.74; p = 0.02). However, there was no difference between the treatment group and the control group regarding the increase in creatinine levels (MD = -0.40; CI 95% -0.88 - 0.08; p = 0.10)

Conclusion:

Low-dose dopamine in acute heart failure has been statistically proven not to increase diuresis or preserve renal function.

Keywords: cute Heart Failure, Low Dose Dopamine, renal function

RED BLOOD CELL DISTRIBUTION WIDTH TO ALBUMIN RATIO AS A NEW PROGNOSTIC BIOMARKER IN CARDIOVASCULAR DISEASE

I. F. Arba¹, C. E. C. Z. Multazam², W. Widiarti¹, P. P. Siahaan¹, D. S. Budi¹, P. B. T. Saputra³, Y. H. Oktaviano³

¹Faculty of Medicine, Universitas Airlangga, Surabaya, Indonesia

²National Heart and Lung Institute, Imperial College London, London, United Kingdom

³Department of Cardiology and Vascular Medicine, Faculty of Medicine, Universitas Airlangga - Dr. Soetomo General Academic Hospital; Cardiovascular Research and Innovation Center, Universitas Airlangga

Background:

The elevation of Red Blood Cell Distribution Width (RDW) and albumin separately has been associated with increase in mortality outcomes among people with cardiovascular disease (CVD). Recent studies propose enhancing its accuracy through incorporating RDW with other biomarkers. Therefore, this study aims to explore whether RDW-to-Albumin Ratio (RAR) could predict mortality better in CVD.

Methods:

A systematic search for eligible studies was conducted in scientific databases including Scopus, Web of Science, PubMed, and ProQuest until December 30, 2023. Mortality outcomes of the highest vs lowest RAR categories were pooled using the Generic Inverse Variance method. Publication bias was evaluated through funnel plot inspection and Egger's test. Subgroup analyses were conducted based on underlying CVDs. Statistical analyses were carried out using Rstudio software, with significance level set at 0.05.

Results:

This systematic review and meta-analysis reviewed 14 high-quality studies published between 2021 and 2023 with 25,513 participants. The underlying diseases included studies were Acute Myocardial Infarction (AMI), Heart Failure (HF), Atrial Fibrillation (AF), aortic valvular disease, stroke and pulmonary embolism. Lowest quartile range of RAR was 0.80–1.20, whilst the highest quartile range of RAR was 6.09–15.45. All studies showed a significant association between higher RAR and increase in mortality outcomes. Pooled results with a random-effect model showed that patients with higher RAR had significantly increased risk of all-cause mortality (RR 2.77, 95%CI: 2.22–3.45, $P < 0.001$; $I^2 = 85\%$). When the analysis for overall all-cause mortality was stratified by the main CVD diagnoses in the study samples, a significant association between RAR values and all-cause mortality persisted across all CVD subgroups (AMI: RR 3.50, 95%CI 2.07–5.94, $I^2 = 81\%$; HF: RR 1.83, 95%CI 0.67–5.00, $I^2 = 99\%$; Stroke: RR 2.18, 95%CI 0.99–4.82, $I^2 = 0\%$; Other CVD: RR 2.91, 95%CI 1.41–6.01, $I^2 = 57\%$; $p = 0.04$) Publication bias was not found in this analysis.

Conclusion:

Elevated RAR was associated with increased mortality in CVD. Thus, it can be considered as a simple yet practical novel biomarker for predicting mortality in CVD.

Keywords: rar, albumin, rdw , cardiovascular disease