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Abstracts: Review Articles



1. Stellate Ganglion Block, from Adjunctive Therapy to Main Therapy in Ventricular Arrhythmia: A Systematic Review

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Background: The management of ventricular arrhythmias (VA) requires a multimodal approach, involving antiarrhythmic medications with ACLS guidelines, implantable defibrillator, catheter ablation, and invasive procedures but mostly still failed. This study sought to characterize the efficacy of Stellate Ganglion Block (SGB) as a treatment in VA that not yet establish in treatment protocol.

Methods: The author conducted published data searches using PubMed/MedLine within years 2000 to 2020. 109 publications were reviewed and 4 studies involved in this review consist of 2 cohort studies and 2 case series.

Results: Sixty-seven patients from 4 studies whose met inclusion criteria (58 ± 12 years of age, 10 women, and 36 men). VA consisted of ventricular tachycardia (22), ventricular fibrillation (3) and both (21). ACLS guidelines were used in all patients but yield a poor outcome. The drugs used for SGB was bupivacaine 0.25–0.50% (26), lidocaine 1–2% (7), xylocaine 1% (6) and ropivacaine 0.25%. The SGB technique used was unilateral (31) and bilateral (15). At 24 hours, 60% of patients were free of VA. Patients whose VA was controlled had a lower hospital mortality rate than patients whose VA continued (5.6% versus 50.0%; $P=0.009$). Implantable cardioverter-defibrillator interrogation showed a significant 92% reduction in VA episodes from 26 ± 41 to 2 ± 4 in the 72 hours after SGB ($P<0.001$). There were no procedure-related major complications. Prior studies reveal that SGB is superior to superior to the antiarrhythmic therapy recommended by the ACLS guidelines in treating ES patients that can be applied in a wide range of healthcare.

Conclusion: Percutaneous SGB may be considered for stabilizing ventricular rhythm in patients for whom other therapies have failed without procedure-related complications. Whether it will be a main therapy, larger prospective randomized studies are needed to understand the role of SGB in VA.

KEYWORDS: Stellate Ganglion Block, Ventricular Arrhythmia

2. Stem Cell Transplantation Improves Left Ventricular Function among Heart Failure with Reduced Ejection Fraction (HFrEF) Patients: A Meta-analysis Study

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Background: Irreversibility of chronic heart failure progression has undoubtedly proven in literature with higher mortality worldwide. Current trends on stem cell research have evolved into the new stage that can evidently ameliorate the disease pathognomonic, left ventricular heart function.

Methods: A total of six randomized controlled trials (RCTs) enrolled human as the samples were retrieved from PubMed, Clinical Key, and Science Direct; it involves 325 chronic heart failure patients consisting of 199 patients received stem cell transplantation and 126 patients underwent standard medication therapy as well as placebo. Further analysis was conducted to calculate weighted mean difference for left ventricular ejection fraction using random effect models via MedCalc version 19.1. Additionally, all suitable full text articles must accomplish Jadad score ≥ 2 for assessing study quality.

Results: Based on the analysis, transplantation of stem cell therapy can improve left ventricular function (MD=1.807, 95% CI 0.648-2.967, $p < 0.05$); Heterogeneity: $\text{Chi}^2 = 86.7$, $\text{df} = 5$ ($P = 0.00$); $I^2 = 94.23\%$ it increases left ventricular ejection fraction (LVEF) among the patients diagnosed with heart failure with reduced ejection fraction (HFrEF) varied from 5-7% of elevation while only one study demonstrated deviant result with negative outcome. Patients received stem cell which originates from various sources including bone marrow, umbilical cord, and mesenchymal precursor cells with different mode of administration.

Conclusions: This study enhanced the evidence of stem cell therapy can become a promising approach to prevent fall out among heart failure patients through the improvement of left ventricular function, which is represented by LVEF.

Keywords: Heart failure, stem cell, left ventricular function, ejection fraction

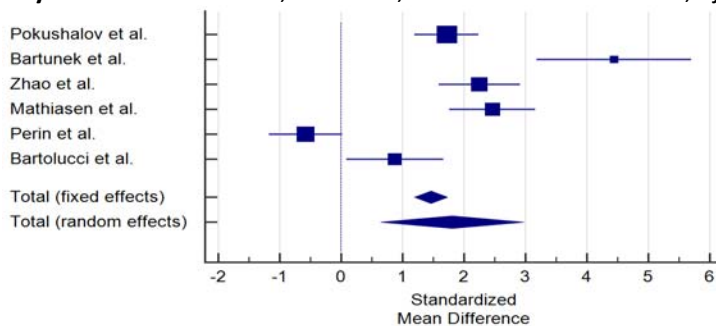


Figure 1. Effect of stem cell transplantation on Left Ventricular Ejection Fraction



3. Effectiveness of Therapeutic Induced-Hypothermia as an adjunctive treatment in ST Elevation

Myocardial Infarction Patients: Systematic Review and Meta-Analysis

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Background: ST Elevation Myocardial Infarction (STEMI) is a deadly condition in despite of maximum reperfusion therapies, it could still continue into another sequelae of cardiac tissue damage. Therapeutic Induced-Hypothermia offers neurological protection during cardiac arrest and hypothesized of salvaging cardiac tissue from ischemic condition. Several studies have showed potential benefits from this method in the setting of STEMI.

Method: Searching strategy was conducted from electronic databases (PubMed, EMBASE, Cochrane, Science Direct) to find relevant randomized controlled trials. Trials showing major adverse cardiovascular events and safety issues of hypothermia therapy in STEMI as the end points were included. Systematic review and meta analysis to calculate the effect model via RevMan 5.3 software were performed.

Result: 5 RCTs with total of 333 patients were included in this meta analysis. The mean difference from infarct resolution (IS/MaS) and the myocardial salvage index (MaS-IS/MaS) measured by CMR were -0.09 [CI 95% 0.15, -0.04 ; p = 0.002] and 0.1[CI 95% 0.03,0.18 ; p = 0.009). Analysis from left ventricular ejection fraction measurement showed inconsiderable result with mean difference -0.01 [CI 95% -0.04, 0.01 ; p = 0.32]. Furthermore, the risk ratio of major cardiovascular event endpoint between induced hypothermia and control was 0.75 [CI 95% 0.55, 1.02 ; p=0.07] revealed interesting result yet statistically insignificant.

Conclusion: Although induced-hypothermia is considered safe, the results from this study showed insignificant difference and limited benefits from it in patients with STEMI.

Keywords: STEMI, Hypothermia, Induced, therapy, resolution, salvage



4. Statins Induced Type 2 Diabetes Mellitus: A Systematic Review

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Introduction: Hydroxymethylglutaryl coenzyme A (HMG-CoA) reductase inhibitors (statins) are among the most widely prescribed drugs with already proven benefits to prevent cardiovascular events. However, a series of findings have shown that statins might play a role in increasing the risk of new onset diabetes mellitus through both impaired insulin secretion and diminished insulin sensitivity.^{1,2}

Method : Literature search were conducted through PubMed and ProQuest. Then, the researchers evaluate quality of the articles with Newcastle Ottawa Scale (NOS) for cohort study and RevMan 5.3 to appraise the risk of bias of each study. A total of 8 cohort studies fulfill the inclusion criteria. All of the studies compared statin versus control group to identify whether statins induced diabetes mellitus or not. Search term used : "Statin" or "Diabetes mellitus" or "Statin induced new onset diabetes mellitus" or "Statin induced new onset diabetes mellitus Cohort Study

Result: All of the Cohort studies have low risk of bias according a Cochrane methodology and met all the good quality criteria using Newcastle Ottawa Scale (NOS) quality assesment. All study that are included in the review confirm that statin has effect to induce NODM, with Rosuvastatin and Atorvastatin had shown the highest HR (2.55 and 2.17) compared to other type of statin. One study shows that the longer duration of statin's consumption (>2 year with HR 2.67), the higher the risk incidence of diabetes mellitus. Several studies show that the higher the intensity of statin (Atorvastatin, Rosuvastatin, Simvastatin), the higher the chance of the person newly developed type 2 diabetes mellitus.

Conclusion: This study concludes that statin induced new onset diabetes mellitus. However, statin's protective effect as primary and secondary prevention treatment of cardiovascular disease still outweighed the risk of developing new onset diabetes mellitus. This review suggests that for patients with low and moderate risk of cardiovascular event, statin consumption should be monitored regularly to prevent the adverse effect.



5. Current Evidence of Irisin as a Diagnostic and Prognostic Cardiometabolic Biomarker in Coronary Artery Disease and Heart Failure: A Systematic Review and Meta-Analyses

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Background Irisin is an adipomyokine that may be utilized as a biomarker in coronary artery disease (CAD) and heart failure (HF). We investigate the role of Irisin as a diagnostic and prognostic biomarker in CAD and HF.

Methods We used PRISMA guidelines and searched Pubmed, EBSCOhost, ProQuest, Taylor&Francis Online, ScienceDirect, and Cochrane Library for English articles published between 1995-2020. Quality of study were evaluated using ROBINS-I tool, and NOS. Reporting quality was assessed using STROBE statement. Data analyses were performed using using Review Manager 5.3 and outcomes were evaluated using fixed or random-effect. Between-study heterogeneity was assessed using Cochran Q test (v_2).

Results Search strategy identified 143 articles. Twelve relevant articles were included for qualitative analysis and seven of them for meta-analyses. ROBINS-I revealed serious risk of bias, while NOS revealed scale of 5-9. Quality of reporting from observational studies were sufficient. Our meta-analyses using random-effect revealed that irisin level were -24.35 ng/mL (95%CI, -32.94 to -15.76 , $p < 0.00001$; $I^2 = 77\%$, $p = 0.0002$) lower in patients with CAD than healthy controls. Meanwhile, higher irisin level indicated nearly 4 fold higher risk of major adverse cardiovascular events in CAD patients compared with control (HR, 3.94 ; 95%CI, $1.91-8.16$, $p = 0.0002$; $I^2 = 0\%$, $p = 0.99$). Irisin level could also indicate severity of CAD. Lower irisin level was also found in HF patients when compared with control group but higher level can be associated with deceased HF. For future mortality risk, one study stated higher irisin level is an independent risk while another study stated otherwise. Higher irisin level also indicated preserved ejection fraction rather than reduced.

Conclusion Irisin level showed significant change during event and progression of CAD and HF. However, evidence are still lacking due to limited study with small sample and statistical heterogeneity based on meta-analysis. Further studies are needed to determined the true value of irisin as future biomarker in CAD and HF.

Keyword: cardiac biomarker, coronary artery disease, diagnosis, heart failure, irisin, prognosis



1. QTc Interval Prolongation after Oral Glucose Tolerance Test in Non-Diabetic Patients with Long QT Syndrome: A Systematic Review and Meta-Analyses of Quasi-Experimental Studies

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Introduction Acute elevation of plasma blood glucose can potentially induce prolongation of QT interval particularly in patients with Long QT syndrome. Our aim is to evaluate QTc interval prolongation after oral glucose tolerance test in non-diabetic patients with LQTS.

Methods This systematic review was in accordance with PRISMA guidelines. We searched Pubmed, EBSCOhost, and ProQuest for English articles published between 1975-2020. Titles and abstracts were reviewed for relevance. Quality of study were evaluated using ROBINS-I tool. Data analyses were performed using Review Manager 5.3 and outcomes were evaluated using fixed or random-effect according to heterogeneity and weight of studies. Between-study heterogeneity was assessed using Cochran Q test (v2).

Results Search strategy identified 420 articles. Four relevant full-text articles met our inclusion criteria and included for meta-analyses. Overall, two articles have low risk of bias, while the others have moderate risk of bias. Our meta-analyses using random-effect revealed 31.33 ms greater prolongation in QTc interval corrected by Bazett's compared with control group, after 30 minutes of 75 g OGTT in non-diabetic patients with Long QT syndrome (MD:31.33; 95%CI,13.07-49.60;p=0.0008;I²=99%,p<0.00001). Meanwhile, there was a 10.39 ms greater prolongation in QTc interval corrected by Fridericia compared with control group, after 30 minutes of 75 g OGTT (MD:10.39;95%CI,8.68-12.10;p<0.00001;I²=0%,p=0.42).

Conclusion There is a significant prolongation of QTc interval after 75 g OGTT test in non-diabetic patients with Long QT syndrome. There were limited number of participants in each non-randomized study and therefore larger randomized controlled trials need to be conducted in the future.

Keyword: cardiometabolic, long QT syndrome, meta-analysis oral glucose tolerance test, QT interval prolongation, systematic review



2. Emergency Heart Failure Mortality Risk Grade : A Novel and Promising Acute Heart Failure Risk Stratification Tool in Emergency Department Setting

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Background and Objective : The initial clinical encounter of patients with acute heart failure often occurs in the emergency department. To date, most physicians only rely upon their clinical judgment in order to decide whether to admit or discharge patients. Prior studies found that physician clinically-judged risk estimation was often inaccurate. Hence it has been developed several risk stratification tools that may support the clinical decision making process, one of them is Emergency Heart Failure Mortality Risk Grade (EHMRG). This study is about EMRGH, its statistical value and advantages compared to other tools.

Method : A systematic literature electronic search was performed by using PubMed and Cochrane, in accordance with PRISMA guidelines.

Result : EHMRG assesses the 7-days mortality since emergency department presentation for patients with acute heart failure. It comprises basic information that can be easily obtained during early hours in ED. The total score will be classified into 5 risk groups : very low, low, intermediate, high, and very high risk.

According to ACUTE study, the combination of EHMRG and physician-estimated risk of 7-day mortality (PER7) has better discrimination than physician-estimated risk of 7-day mortality (PER7) alone (c-statistic 0.82; 95%CI 0.76, 0.88, $p = 0.003$ vs. PER7). EHMRG has a c-statistic of 0.81 for the derivation cohort and 0.83 for the external validation cohort. The addition of several variables significantly improves the EHMRG performance, such as BNP or NT-proBNP ($p = 0.007$), CTAS score ($p = 0.002$), and ST-depression in 12-lead ECG ($p < 0.001$).

Prior studies reveal that EHMRG is superior to other risk stratification tools because it has been externally validated and does not depend on advanced examinations with limited accessibility, thus it can be applied in a wide range of healthcare.

Conclusion : EHMRG should support rather than replace physicians' clinical judgment.

Keywords : EHMRG, Acute Heart Failure, Emergency Department



3. SYSTEMATIC REVIEW AND META ANALYSIS ON PATIENT WITH INFLAMMATORY BOWEL DISEASE AS THE NEW RISK OF MYOCARDIAL INFARCT: THE GUT MICROBIOTA-HEART AXIS

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Background: Intestinal microbiota plays an important role in body homeostasis. In the inflammatory bowel disease (IBD) patients, the alteration in gut microbiota and the increased in gut permeability, leading to bacterial translocation and chronic inflammation. Reciprocally, high serum lipopolysaccharide and lipid metabolism changes, caused by dysbiosis microbiota, are the main factor of atherosclerosis development in Myocardial Infarction (MI). The trend in the heart-gut microbiota axis shows novel etiology in cardiovascular disease (CVD), particularly myocardial infarction. However, some studies are contraindicated by current studies in which traditional cardiovascular risk factors seen to be insignificant risk. With this systematic review and meta-analysis, we aimed to measure the risk of MI in the IBD patients which adjusted to traditional cardiovascular risk factors.

Methods: We conducted electronic database include PUBMED, MEDLINE, and ProQuest through to November 2019 for cohort study reporting the risk of myocardial infarct in patients with IBD. Analysis was applied using a random-effect model for I^2 value greater than 50%. Pooled calculation in hazard ratios (HRs) with 95% confidence intervals (CIs) were used to assess the eligible patients.

Results: Overall, after included cohort study which adjusted traditional cardiovascular risk factor such as hypertension, chronic kidney disease, diabetes mellitus, dyslipidemia, smoking, obesity and familial coronary disease. We collected five studies consist of 324,139 IBD patients and 29,049,240 non IBD patients showed developing Myocardial Infarction in the IBD group with adjusted Hazard Ratio was 1.252 (95% CI 1.237-1.267, $I^2 = 89,3\%$).

Conclusion: Based on our study, IBD independently can increase risk of myocardial infarct. IBD alone appears to be eminent in increase of MI incidence after controlling five traditional cardiovascular risk factors.

Keywords: Irritable bowel disease, Myocardial Infarct, Heart Gut Axis.

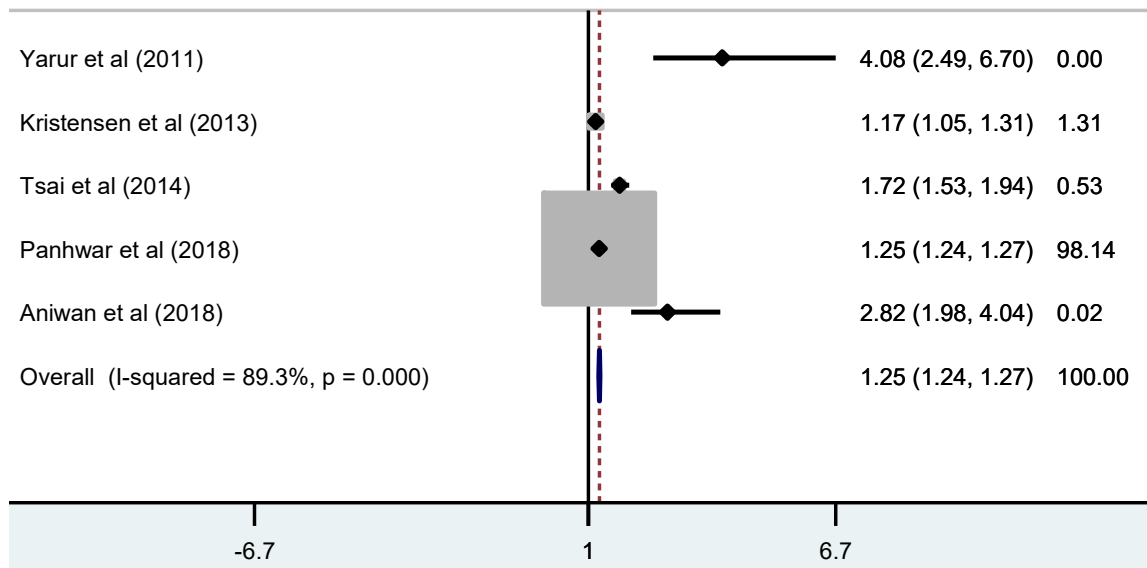


Figure 1. Forest plot of plot of Risk Myocardial Infarct in Patient with Inflammatory Bowel Disease, adjusted with Traditional Cardiovascular Disease Risk Factor (Hypertension, Chronic Kidney Disease, Diabetes Mellitus, Dyslipidemia, Smoking, Obesity And Familial Coronary Disease)



9. Comparative effects of Exercise Training Approach on Reduction of Blood Pressure: A systematic Review and Network Meta-analysis

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Background: Pairwise meta-analyses have shown beneficial effects of individual exercise approaches on blood pressure but their comparative effects have not been established. We performed a systematic review of different exercise training intervention trials and estimated the aggregate blood pressure effects through network meta-analysis.

Methods: Pubmed and Cochrane were searched until December 2019. The inclusion criteria were defined as follows: i) Randomized trial with exercise training approach; ii) minimum intervention period of 12 weeks, iii) mean age \geq 18 years old. We then performed random effects network meta analysis on both diastolic and systolic blood pressure (SBP and DBP) to determine the pooled effect of each intervention relative to each of the other intervention.

Results: A total of 92 trials comparing 7 exercise training approaches (endurance training, dynamic resistance training, isometric resistance training, combined endurance and/or dynamic resistance and isometric resistant training, tai chi, heat-water based exercised, and control), totalling 4577 participants were included. In the network meta analysis, the endurance, dynamic resistance training, isometric resistance training, combined endurance and/or dynamic resistance and isometric resistant training, tai chi, heat-water based exercised training approach were significantly more effective in reducing systolic blood pressure (-5.67 to -2.44 mmHg) and diastolic blood pressure (-8.92 to -1.66 mmHg) than control. According to SUCRAs, tai chi was ranked the most effective exercise training approach in reducing SBP (77.7%), followed by combination exercise (72.9%) and endurance exercise (58.8%), while heat water based exercise was ranked the most effective one in reducing DBP (97.3%), followed by endurance training (63.7%) and Taichi (58.2%).

Conclusion: This network meta-analysis suggest that tai chi and endurance exercise approach might be the most effective exercise measure to reduce blood pressure.

Keyword: *physical exercise, network meta-analysis, blood pressure, endurance, isometric, resistance*

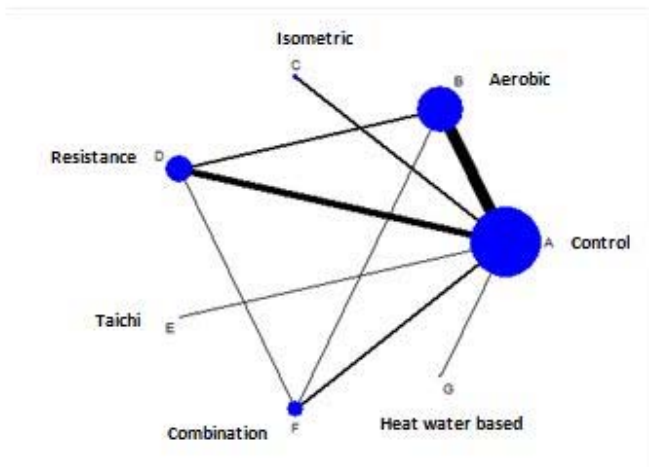


Figure. Network diagram for Systolic blood pressure: The size of the nodes is proportional to the total number of participants allocated to each exercise approach and the thickness of the lines proportional to the number of studies evaluating each direct comparison



10. Fragmented QRS as Predictor of Major Adverse Cardiac Event and Mortality in Acute Myocardial Infarction Patients: A Meta-Analysis

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Background: Fragmented QRS (fQRS) is an electrocardiogram finding that indicates myocardial scar. Clinical studies found that the presence of fQRS was associated with various cardiovascular disease and had prognostic significances, particularly in myocardial infarction. This meta-analysis was made to evaluate the role of fQRS as a prognostic marker in patients with acute myocardial infarction.

Methods: We systematically searched for observational study about fQRS in acute myocardial infarction and its prognostic values from PubMed, Cochrane Library, EBSCO, Scopus, and ProQuest up to July 2020. The primary outcomes were major adverse cardiac events (MACE) and all-cause mortality. Meta-statistics were done using the random-effect model.

Results: We selected 15 eligible observational studies for analysis. MACE was higher in fQRS (+) group compared to fQRS (-) group (OR: 4.98, 95% CI 2.84-8.71; $p < 0.001$). All-cause mortality was significantly higher in fQRS (+) group compared to fQRS (-) group (OR: 4.05, 95% CI; $p = 0.003$).

Conclusion: This meta-analysis showed that fQRS is significantly associated with increased MACE and all-cause mortality in patients with acute myocardial infarction.

Keywords: fragmented QRS, acute myocardial infarction, major adverse cardiac events, mortality



11. New Promises Mechanism of Colchicine for Prevention of Cardiovascular Events Induce by on-going Inflammation: Systematic Review and Metanalysis

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Background: Inflammation is a key process implicated in the pathogenesis of cardiovascular disease at all stages and because colchicine has unique anti-inflammatory effect through NLRP3 inflammasome. We systematically reviewed cardiovascular benefits of colchicine in any population and specifically in patients with high cardiovascular risk. We evaluate the evidence supporting the potential role of colchicine in improving outcomes and reducing cardiovascular morbidity and mortality in patients with CVD.

Methods: A systematic computer-based search was conducted in PubMed, EMBASE, and Cochrane Database of Systematic Reviews. We include 4 trials with 2743 patients. Data on patients with AMI that undergo optimal medical therapy compared Colchicine versus others (non-used Colchicine) were retrieved. Primary outcomes were myocardial infarction, stroke, or urgent hospitalization for angina leading to coronary revascularization and adverse events. After testing for heterogeneity between studies, data were aggregated for random-effects models when necessary.

Results: Our result showed insignificantly reduced risk of myocardial infarction in colchicine group compared to control group (RR 0.46 [0.17, 1.24], p=0.1) and insignificantly reduced risk of rehospitalization in colchicine group compared to control group (RR 0.57 [0.29, 1.13], p=0.11) but significantly reduced risk of ischemic stroke in colchicine group compared to control group (RR 0.26 [0.10, 0.63], p=0.003).

Conclusion: Colchicine may have substantial cardiovascular benefits although the meta-analysis result was not significant; however, there is sufficient uncertainty about its benefit to indicate the need for large-scale trials to further evaluate this inexpensive, promising treatment in cardiovascular disease. Further clinical trial evaluating the potential of colchicine for prevention of cardiovascular events would be of interest.

Keywords: Colchicine, Cardiovascular disease, Meta-analysis



12. Coffee consumption and incidence of atrial fibrillation: A systematic review from observational cohort studies

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Background: Coffee had bad reputation of inducing palpitations and heart arrhythmias, such as atrial fibrillation (AF). Many studies had been conducted but the results were inconsistent each other. This study aimed to evaluate the association between coffee consumption and AF.

Methods: Cochrane Library and PubMed Central were searched until June 2020 to identify observational studies addressing the association of coffee consumption and incidence of AF. The studies were then reviewed and selected to be included in this study.

Results: Four observational cohort studies, evaluating total study population of 105,898 individuals, were included. One study reported a modestly increased risk of incident AF with intermittent, non-habitual coffee consumption (HR 1.22, 95% CI 1.01 – 1.48, $p < 0.05$). The other studies supported it, which stated lower rate of AF with routine coffee consumption. The first one reported higher coffee intake was associated with moderately lower rate of AF ($p = 0.02$). The second and third studies mentioned a decreased incidence of AF is associated with a light level of coffee consumption (1-7 cups per week and 1-3 cups per day, respectively), as compared to not drinking coffee or just doing it occasionally.

Conclusion: Routine coffee consumption was not associated with increased incident AF, in fact it might have a protective effect.

Keywords: coffee, caffeine, atrial fibrillation



13. Novel Inflammatory Biomarker - Pentraxin 3 and Association with Left Ventricular Diastolic Dysfunction: A Systematic Review

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Background: Asymptomatic left ventricular diastolic dysfunction (LVDD) is a powerful and independent predictor of death and is considered a cause of abnormalities in the pathophysiology of *heart failure with preserved ejection fraction* (HFpEF). Biomarkers for inflammation may provide important information about the pathogenesis and diagnosis of HF. Pentraxin-3 (PTX3) was a novel marker of inflammation produced by innate immunity cells. This review aimed to determine correlation of PTX3 with LVDD.

Methods: Major medical databases (PubMed, Science Direct, ProQuest) were systematically searched on topics that assess Pentraxin 3 with LVDD until February 2020. The search was limited to observational studies or trials, human subjects, and full-text availability. We used NOS to measure the quality of evidence.

Results: Four prospective case controls with a total of 530 patients were included for analysis. All four studies were good and fair in quality. PTX3 measurements were baseline only, with no longitudinal assessment reported. A study showed PTX3 was higher in non-HF with LVDD than without LVDD (2.28(1.63–3.00) vs. 1.99(1.35–2.65); $p < 0.05$). PTX3 was also higher in HFpEF than in non-HF with LVDD (OR 1.54 (95%CI:1.08–2.18), $p < 0.05$). Two studies showed that PTX3 were associated with diastolic cardiac function and were higher in impaired left ventricle relaxation of diabetic patients. A study in obstructive sleep apnea showed that PTX3 was positively correlated with the E/Em ratio and LAVI ($r = 0.562$, $r = 0.550$, $p < 0.01$). Several limitations include non-random trial assignment, high levels of heterogeneity due to differences in study population and LVDD definitions, small sample size, and no longitudinal PTX3 measurements.

Conclusions: This literature review would provide insight into potential correlation of PTX3 with LV diastolic dysfunction. However, further exploration of the clinical usefulness of plasma PTX3 levels in diagnosing patients with LVDD requires large-scale controlled studies.

Keywords: pentraxin 3, diastolic dysfunction, heart failure, preserved ejection fraction



14. Clinical Presentation and Treatment Outcomes of Aortic Stent-Graft Infection:

A Systematic Review and Meta-Analysis

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Background: Aortic stent-graft infection is one of the most devastating complications following endovascular aortic repair. Due to its rarity, little is known about this problem, and currently, there are no approved guidelines nor consensus regarding this matter. We sought to determine the clinical presentation and the treatment outcomes.

Methods: A systematic search was conducted through PubMed, ScienceDirect, and Cochrane using keywords of aorta, graft, infection, and their synonyms. We looked for original research articles that included adult patients who had undergone endovascular aortic repair (thoracic and abdominal) and encountered post-procedural graft infection. Primary end-point was mortality.

Results: Six articles involving 258 subjects were included. Most subjects were male (81%), and mean age was 69 (51-84.3). Infection was more frequent in abdominal graft than thoracic graft (89.9% vs 10.1%). Clinical presentation was diverse: 61.2% had fever, 56.6% had back or abdominal pain, 27.5% had aortoenteric fistula, and 19.4% had endoleak. Less common manifestations include sepsis (5.43%), rectal bleeding (1.16%), aortic rupture (0.08%), and asymptomatic (3.88%). Microbial culture was positive in 67.1% subjects that detected gram-positive/negative bacteria, or polymicrobial. Mean time of infection onset was 20.6 months (0.2-158 months) post-procedure. Most patients underwent surgical treatment (85.2%: 75.2% in situ replacement; 9.30% extra-anatomical bypass; 0.78% surgical drainage), and remaining 14.8% had conservative antibiotic treatment. Mean follow-up time from initial endovascular repair was 22.9 (1-149) months and pooled mortality rate was 46.5%. Mortality was significantly lower in abdominal graft infection compared to thoracic graft infection (45.8% vs 73.1%; $p = 0.007$; OR 0.29 [95% CI 0.12-0.71]) and in surgical group compared to conservative treatment group (46.8% vs 64.3%; $p = 0.03$; OR 0.35 [95% CI 0.14-0.89]).

Conclusion: Aortic stent-graft infection is a challenging complication with a considerable mortality rate. Surgical management remains the mainstay of treatment.

Keywords: stent-graft infection, TEVAR, EVAR, surgery, conservative

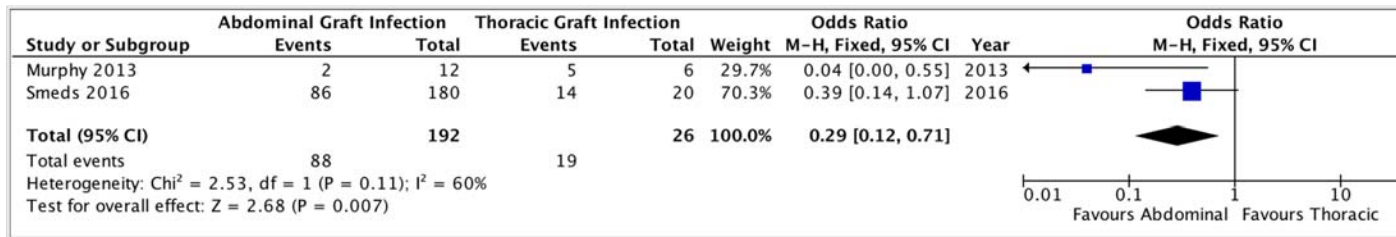


Figure 1. Forest plot of meta-analysis between location of graft infection (abdominal vs thoracic) and mortality



15. Comparison Between HeartMate II vs. HeartMate III in Left Ventricle Assisted Device Implantation in Patient With Advanced Heart Failure : A Systematic Review and Meta-Analysis

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Introduction : Left Ventricle Assisted Devices (LVAD) is increasingly used as a treatment for patient with Advanced Heart Failure because of its availability, leaving heart transplantation as a last resource. This systematic review and meta analysis will be conducted to evaluate the advantages of this two devices.

Methods : Journal searching from PubMed, Embase, Medline, Cochrane and ResearchGate for relevant published Randomized Controlled Trials (RCTs) between 2015 - 2020. Primary end point is to evaluate the overall survival and subgroup analysis will be performed in adverse events related to device implantation. Secondary end point is to provide reliability evidence for clinicians' decision-making.

Results : in total 67 references were identified, 3 studies involving 2142 participants were included in this meta-analysis. There were statistically significant difference in overall survival with pooled OR 1.37 [1.13, 1.66] $p < 0.001$ favoring Heartmate III, No heterogeneity $I^2 = 0\%$. means that HeartMate III have 1.37 times higher in overall survival compared to HeartMate II. Pooled analysis were also performed in a post operative outcomes such as pump thrombosis, gastrointestinal bleeding, re-operation and stroke [Pooled OR 10.59 [4.95, 22.68] $p < 0.001$, $I^2 = 15\%$; OR 1.39 [1.05, 1.82] $p = 0.02$, $I^2 = 0\%$; OR 1.99 [1.05, 1.82] $p < 0.001$, $I^2 = 0\%$; OR 2.69 [2.07, 3.50] $p < 0.001$, $I^2 = 31\%$ respectively] favoring HeartMate III.

Conclusion :

LVAD HeartMate III is statistically significant to have a good overall survival and reduced post-operative adverse events compared to HeartMate II.

Keywords : Overall Survival, Advanced Heart Failure, Left Ventricle Assisted Device, HeartMate II, HeartMate III



16. Transcatheter Closure of Heart Septal Defects with and without Fluoroscopy Guidance: A Comprehensive Meta-analysis

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Background: Fluoroscopy is a conventional imaging technique for cardiac catheterization. However, radiation exposure during fluoroscopy harms both patient and medical staff for the development of cataract, arteriosclerosis, and cancer. Thus, this study aimed to assess the efficiency of transcatheter closure of heart septal defects guided completely by echocardiography compared with the procedure guided by fluoroscopy.

Methods: A comprehensive literature searching was conducted through five electronic databases (PubMed, Cochrane, Proquest, ScienceDirect, and Ebscohost) for studies comparing the use of echocardiography alone versus fluoroscopy imaging technique for a transcatheter closer of heart septal defects up to 12nd August 2020. The primary endpoint was the success rate and procedure time. Moreover, the secondary endpoint was residual shunts and post-procedural complications. Data were analyzed using a random-effects model with RevMan version 5.4.

Results: Five studies – one randomized control trial and four cohort retrospective studies – with 1365 total patients were finally analyzed for meta-analysis. The result showed similar outcomes between transcatheter closure guided completely by echocardiography and the procedure guided by fluoroscopy with regard to success rate (pooled risk ratio, RR=1.00 95% CI [0.99, 1.01]; p=0.97), residual shunts (pooled risk ratio, RR=1.27 95% CI [0.78, 2.08]; p=0.33), and post-procedural complications (pooled risk ratio, RR=0.24 95% CI [0.002, 3.52]; p=0.30). Ranges of procedure time in different groups were extracted as mean ±standard deviation. We found that the procedure time in zero fluoroscopy group was shorter but the mean difference with the fluoroscopy group was not statistically significant (pooled mean difference, MD=-10.74 95% CI [-24.08, 2.60]; p=0.11).

Conclusion: Transcatheter closure with echocardiography guidance alone is as efficient as closure with fluoroscopy guidance and also can be used as an alternative to avoid the use of radiation and contrast agents.

Keywords: cardiac catheterization, heart septal defects, fluoroscopy



17. Cardiac Injury and Mortality in Coronavirus Disease 2019 Patient : A Systematic Review and Meta-analysis

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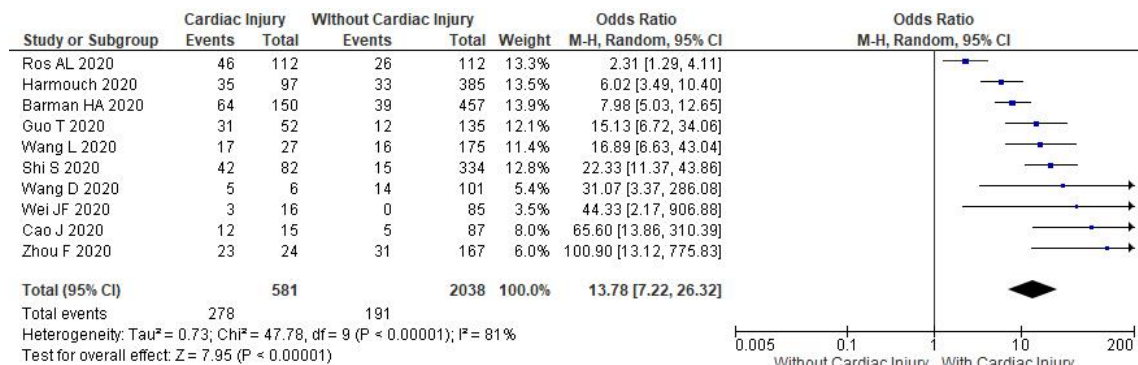
Background: Coronavirus disease 2019 (COVID-19) has been an emerging global health threat. COVID-19 manifests not only as respiratory disease, but also systemic disease involving the cardiovascular system. Cardiac injury has been reported in many COVID-19 cases and is correlated with worse outcomes. The purpose of this study is to analyze the correlation between cardiac injury, evidenced by elevated biomarker, with mortality in COVID-19 patients.

Methods: We performed a systematic review of literatures in PubMed, Cochrane, and ScienceDirect up to August 10, 2020. We screened cohort, case-control or case series studies which evaluated the effect of cardiac injury on mortality. Papers which only include severe COVID-19 patents, no data of increased cardiac marker, and unpublished studies were excluded. The primary outcome was all cause mortality. We conducted quality assessment using GRADE approach. Odds ratio and 95% confidence interval (CIs) were estimated with random effects model and heterogeneity was assessed with I2 test using RevMan 5.4.

Results: We screened 814 abstracts, 61 full texts were reviewed, and 51 articles were excluded due to discordance to our inclusion criteria. A total number of 10 studies published in 2020, comprising 2619 patients (2038 without cardiac injury and 581 with cardiac injury) were included in the meta-analysis. All articles included in the meta-analysis had high quality according to the GRADE approach. From our analysis, cardiac injury is associated with a statistically significant increase in all-cause mortality (OR 13.78; 95% CI 7.22 - 26.32, $p < 0.00001$). The range of confidence interval does not contain value of no effect.

Conclusion: Cardiac injury is associated with higher mortality in COVID-19 patients. Therefore, cardiac injury should be considered as an important variable in the risk stratification for death in COVID-19. Aggressive treatment may be considered for COVID-19 patients with cardiac injury.

Keywords: cardiac injury, troponin, mortality, COVID-19





18. Abnormal Coagulation Profiles in COVID-19 and Its Role in Predicting in-Hospital Mortality: A Meta-Analysis

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Background: Early recognition of severe forms of COVID-19 is essential for predicting the prognostic of each patients. The development of coagulopathy was one of the most significant poor features. The aim of this meta-analysis was to identify the prognostic role of coagulation profiles in predicting in-hospital mortality of COVID-19.

Methods: A systematic search of all observational studies or trials involving adult patients with COVID-19 and presented with coagulation parameter on admission was carried out using the PubMed, Science Direct, Scopus, ProQuest, and MedRxiv databases. Methodological quality was assessed using the NIH Quality Assessment Tool. We conducted the meta-analysis using mean difference (MD) for coagulation profile values. We employed a random-effects and inverse-variance weighting using Review Manager (RevMan v5.4 2020). Mantel-Haenszel formula was used for dichotomous variables to calculate the odds ratios (ORs).

Results: A total of 30 studies (6,449 patients) were included in this meta-analysis. Our meta-analysis showed that non-survivor group, compared to survivor group, had increased D-dimer (MD = 2.57 [95%CI: 2.15 to 3.00], $p < 0.001$; OR = 6.35 [95%CI: 2.24 to 17.96], $p < 0.001$); prolong APTT (MD = 1.65 [95%CI: -0.22 to 3.52], $p = 0.08$); prolong PT (MD = 1.05 [95%CI: 0.46 to 1.63], $p < 0.001$; OR = 2.49 [95%CI: 1.00 to 6.20], $p = 0.05$); increased INR (MD = 0.15 [95%CI: 0.11 to 0.20], $p < 0.001$); lower antithrombin (MD = -6.75 [95%CI: -7.77 to -5.73], $p < 0.001$); decreased platelet count (MD = -33.91 [95%CI: -45.62, -22.21], $p < 0.001$; OR = 3.89 [95%CI: 1.71 to 8.85], $p = 0.001$); prolong TT (MD = 0.58 [95%CI: -1.47 to 2.63], $p = 0.58$); increased FDP (MD = 4.09 [95%CI: -0.67 to 8.85], $p = 0.09$); and increased fibrinogen (MD = 0.20 [95%CI: -0.01 to 0.41], $p = 0.06$).

Conclusion: Abnormal coagulopathy parameter on admission including D-dimer, Platelet, PPT, INR, and antithrombin were significantly associated with mortality outcome in COVID-19 patients.

Keywords: COVID-19; coagulopathy; mortality; prognostic factor



19. Descending Aorta Geometry as Predictor of Late Adverse Outcomes in Patients with Uncomplicated Type B Aortic Dissection: A Systematic Review and Meta-Analysis

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Background: Expert consensus currently recommend only medical treatment for the management of patients with uncomplicated type B aortic dissection (uTBAD). However, it is known that a subset of patients in this category may possess higher risk of developing late adverse events that may benefit from earlier intervention. Therefore, we conducted an analysis to investigate the role of descending aorta geometry, including total descending aorta diameter (TDAD) and false lumen diameter (FLD), as predictor of late adverse outcomes in patients with uTBAD.

Methods: A systematic search was performed through Pubmed, ClinicalKey, ScienceDirect, and Cochrane Library to identify relevant studies. Studies assessing the association of either initial TDAD or FLD and late adverse outcomes in patients with uTBAD successfully treated with only medical therapy were selected for further quality assessment. All meta-analyses were performed using Review Manager version 5.4.

Results: A total of 2,339 (male 68.8%) patients from a total of 15 cohorts were included in our analysis. During follow-up period, there were 655 (27.3%) and 149 (6.3%) cases of late aortic events and mortality, respectively. Patients experiencing late aortic events tended to have higher maximum TDAD at the initial presentation compared to those who remained stable (mean difference 6.48 [4.48-8.48]; $p < 0.00001$). Patients whose initial TDAD exceeding the pre-specified cut-off value were 6.06 (CI 4.49-8.18; $p < 0.00001$) and 4.86 (CI 3.25-7.25; $p < 0.00001$) more likely to experience late aortic events and mortality following their first hospital discharge. Maximum FLD at the initial presentation seemed to significantly associated with late aortic events (OR 2.85, CI 1.52-5.39; $p = 0.001$) but not with mortality (OR 2.81, CI 0.91-8.66; $p = 0.07$).

Conclusion: Descending aorta geometry, particularly maximum initial TDAD, is a good and helpful predictor of late adverse outcomes in patients with uTBAD.

Keywords: Descending Aorta Diameter, False Lumen Diameter, Aortic Events, Mortality, Uncomplicated Type B Aortic Dissection

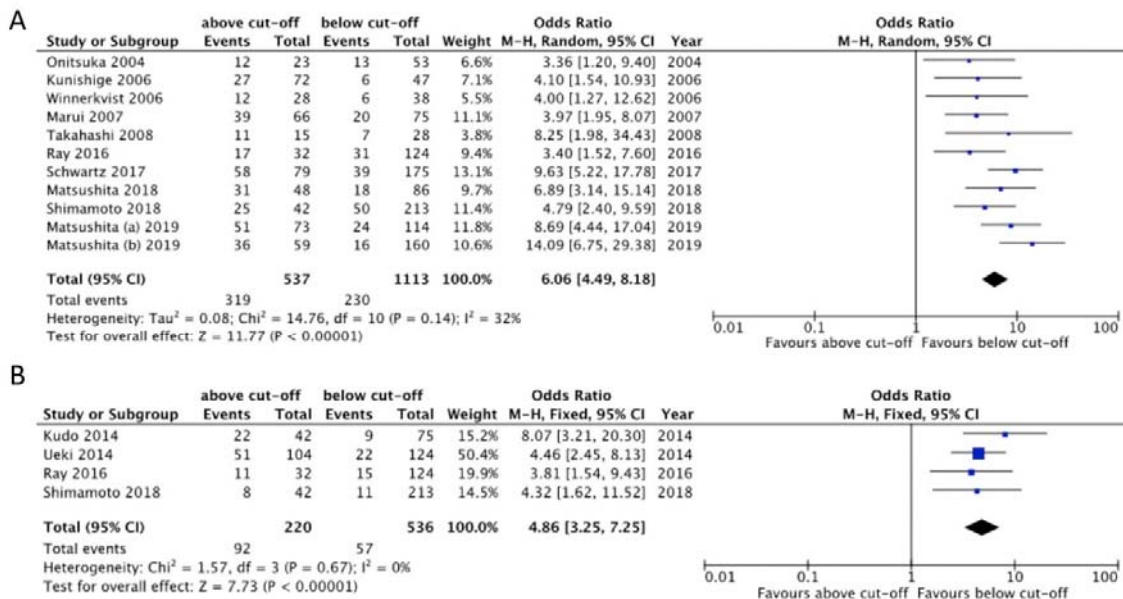


Figure 2. Forest plot of the meta-analysis for the association between maximum initial total descending aorta diameter with adverse aortic events (A) and mortality (B)



20. Efficacy and Safety of Vericiguat, Novel Oral Soluble Guanylate Cyclase (sGC) Stimulator in Chronic Heart Failure: Systematic Review

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Background: New treatment options are needed to decrease heart failure (HF) rehospitalization and worsening HF. In HF, increased inflammation and vascular dysfunction results in reduced nitric oxide bioavailability and decrease cyclic guanosin monophosphate (cGMP) synthesis. cGMP pathway is a critical regulator of myocardial energetic, cardiac performance and endothelial function. Vericiguat has novel potential therapeutic approach through nitric oxide soluble guanylate cyclase (sGC)-cyclic guanosin monophosphate (cGMP) pathway in worsening chronic HF. The aim of this study was to assess the effect of Vericiguat in chronic HF Patients.

Methods: Literature search was conducted using PubMed, Cochrane and Scopus database until June 2020 to find randomized control trial (RCTs), which assessed Vericiguat administration on heart failure (HF) patients. A systematic review of published studies was performed. The outcomes of vericiguat efficacy included Cardiovascular death or HF hospitalization (adjusted hazard ratio 95%CI) and log NT-Pro BNP levels (measured by mean±SD 95%CI). The most common adverse event were measured by Risk Ratio (RR) and 95%CI.

Results: A total of 3 RCTs involved 3270 intervention and 2709 control participants. The result showed that Vericiguat group improved CV death and HF Hospitalization in Heart Failure reduced ejection fraction (SOCRATES-HF aHR 0.53, 95%CI: 0.25 – 1.16; VICTORIA aHR 0.90, 95%CI: 0.82 – 0.98). There is no significant difference in change log-transformed NT-Pro BNP levels between vericiguat group and Placebo group. However, linear regression modelling suggested a dose-response relationship with higher vericiguat group with greater reduction in NT-Pro BNP levels. Rate of adverse events including hypotension, syncope and acute kidney injury were similar between vericiguat and control group.

Conclusions: Vericiguat showed efficacy and safety in chronic heart failure patients. However, further studies with larger scale and better designs are needed to confirm the results and eliminate bias.