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EFFECT OF LOW LEVEL TRAGUS STIMULATION ON SUPRAVENTRICULAR TACHYCARDIA INDUCIBILITY AND BASIC INTERVALS OF ELECTROPHYSIOLOGY STUDY

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Background and aims: Low level tragus stimulation (LLTS) is a new emerging noninvasive modality to increase vagal tone through the auricular branch of the vagus nerve. LLTS has showed promising result in arrhytmia treatment. Effect of LLTS on the inducibility of supraventricular tachycardia (SVT) and basic intervals of electrophysiology study (EPS) in patients with dual atrioventricular node has not been studied.

Materials & methods: This pre-experimental study with one group pretest-posttest design involved 20 patients with dual atrioventricular node undergoing EPS at Dr. Kariadi General Hospital Semarang. LLTS was given for 15 minutes on the right tragus at 20 Hz frequency, 200 μs pulse width, 1 mA amplitude below discomfort threshold. The variables assessed were SVT inducibility, PA interval, AH interval, sinus cycle length and tachycardia cycle length before and after LLTS intervention.

Results: There was a significant prolongation of PA interval (38.8±8.3 ms vs 42.9±10.2 ms; p=0.032) and AH interval (70.5±12.9 ms vs 78.9±13.9 ms; p=0.004) after LLTS intervention. Meanwhile, sinus cycle length , tachycardia cycle length and SVT inducibility was not significantly different after LLTS intervention.

Conclusion: LLTS intervention causes significant prolongation of PA and AH intervals in patients with dual atrioventricular node but not prolonged sinus cycle length, tachycardia cycle length and not affecting the SVT inducibility. Further research with longer duration of LLTS is needed to determine the effect on SVT inducibility and basic intervals of EPS.

Keywords: LLTS, SVT, Vagal Tone

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ARRHYTHMIA PROFILE OF LVNC PATIENT IN NATIONAL CARDIOVASCULAR CENTER HARAPAN KITA 2021-2023. SINGLE CENTER STUDY.

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Background and aims: Left ventricular noncompaction (LVNC) is a heterogeneous myocardial disease characterized by prominent myocardial trabeculations diagnosed by Echo and/or Cardiac MRI. LVNC has wide spectrum of cardiac arrhythmia and data about is somehow still limited. This study aims to see arrhythmia profile of LVNC patients diagnosed with CMR in National Cardiovascular Center Harapan Kita.

Material & Methods: This is retrospective Cross-Sectional study of patient who diagnosed with LVNC in National Cardiovascular Center Harapan Kita (NCCHK) from 2021 - 2024. Subject characteristic were measured include sex, age, EF, TAPSE, ASCVD risk factors, presence of late gadolinium enhancement, Petersen Ratio, and type of arrhythmia. All variable was analyzed using Chi-Square.

Results: From this study, 15 patient was diagnosed with LVNC between 2021-2024. Ventricular arrhythmia (VA) was the most frequently encountered arrhythmias by 81.8%. Patient with arrhythmia had higher rates of rehospitalization event. All of ventricular arrhythmia were multifocal origin, but most of them were non LBBB-Inferior axis origin dominant. Patient who had VA with non LBBB-inferior axis had higher rehospitalization rates. Patient with arrhythmia had significantly lower median of LVEF and TAPSE. There were also more patients who had LGE and petersen criteria > 3 in the arrhythmia group, although it's statistically non significant. There were also more patients who experienced thromboembolic events in the arrhythmia group.

Conclusion: Ventricular Arrhythmia was the most frequently encountered arrhythmias in LVNC patient in NCCHK. Most of them were RBBB morphology dominant. Patient who had VA with non LBBB-inferior axis had higher rehospitalization rates. Patient with arrhythmia had significantly lower median of LVEF and TAPSE. Patient with arrhythmia had higher rates of rehospitalization event.

Keywords: LVNC, ventricular arrhythmia, atrial, PVC, predictor

Baseline Characteristic LVNC Patient in NCCHK 2021-2024

Variable	Arrhythmia (n=11)	Without Arrhythmia (n=4)	P value
Sex			
Female	2 (18,2%)	1 (25,0%)	1,000
Male	9 (81,8%)	3 (75,0%)	
Age	42 (18 – 67)	31 (20 – 59)	0,46
LVEF	**24 (16 – 41)**	**43 (23 – 60)**	**0,05***
<30	7 (63.6%)	1 (25.0%)	0,28
TAPSE	**16 (13 – 20)**	**21 (16 – 31)**	**0.04***
TAPSE < 17 mm	6 (54.5%)	0 (0.0%)	0.58
DM type 2	1 (9.1%)	1 (25.0%)	0.10
Hypertension	1 (9.1.0%)	0 (0%)	1,000
Dyslipidemia	2 (18.2%)	1 (25.0%)	1.000
Smokers or ExSmokers	1 (9.1%)	0 (0%)	1,000
Family History	0 (0%)	0 (0%)	N/A
LGE	5 (55.6%)	2 (66.7%)	1.000
Petersen ratio	3.0 (2.3 – 6.3)	3.0 (2.3 – 3.8)	1.000
Petersen >=3	5 (55.6%)	2 (66.7%)	1.000
Thromboembolism	4 (36.4%)	1 (25.0%)	1.000
Hospitalization	**10 (90.8%)**	**1 (25%)**	**0.03***
Hospitalization event	**3 (0 – 11)**	**0 (0-2)**	**0.02***
Mortality	2 (18.2%)	0 (0.0%)	1.000

	VA LBBB InferiorAxis	VA Non LBBB Inferior Axis	Other Arrhythmia	P value
Hospitalization event	-	**4 (0 – 11)**	**1.5 (0 – 3)**	**0.029***
	2.5 (2 – 3)	-	2 (0 – 11)	0.73

Arrhythmia in LVNC (%)	
VT	3 (27.3%)
PVC	5 (45,5%)
Ventricular Arrhythmia	9 (81.8%)
LBBB -Inferior Axis	2 (18.2%)
Other VA origin	7 (54.5%)
Atrial Arrhythmia	3 (27.3%)
Block and Bradyarrhythmia	3 (27.3%)

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EVALUATION OF INDEX OF CARDIAC-ELECTROPHYSIOLOGICAL BALANCE CHANGE USING PEAK-TO-END T WAVE / QT RATIO BEFORE AND AFTER HEMODIALYSIS IN PATIENTS WITH END-STAGE RENAL DISEASE

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Background and aim: Patients with end stage renal disease (ESRD) undergoing hemodialysis have a high cardiovascular mortality rate and a higher risk of developing ventricular arrhythmias and sudden cardiac death. Index of cardiac-electrophysiological balance (iCEB) such as Peak-to-end T wave / QT ratio (Tp-e/QT) is expected to serve as a simple screening tool in assessing the risk of impaired ventricular repolarization and the occurrence of ventricular arrhythmias in this population. In this study, we investigated Tp-e/QT change before and after hemodialysis.

Material & Methods: This study was a cross-sectional and was conducted in November-February 2022. It included 43 ESRD patients underwent electrocardiogram, echocardiogram, and laboratory examination before and after hemodialysis. The changes in Tp-e/QT parameters before and after hemodialysis were compared using paired t-test.

Results: From all 43 subjects, 55.8% were male patients with a median age of 54 years. Hypertension (79%) and diabetes mellitus (44.1%) were the most common comorbidities in this population. The mean of Tp-e/QT before hemodialysis was 0.206±0.05, while the mean of Tp-e/QT after hemodialysis was 0.218±0.05. There was a significant 0.012±0.036 increment Tp-e/QT after hemodialysis (p=0.032).

Conclusion: Index of cardiac-electrophysiological balance (ratio of Tp-e/QT) is a non-invasive parameter showing the risk of ventricular arrhythmia. Tp-e/QT was found increasing after hemodialysis suggesting that malignant ventricular arrhythmia risk increases after hemodialysis episode. Larger studies on this subject are needed to confirm our results.

Keywords: End stage renal disease, Hemodialysis, Peak-to-end T wave/QT ratio, Index of cardiac-electrophysiological balance, sudden cardiac death, ventricular arrhythmia

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CORRELATION BETWEEN LEFT ATRIAL WALL THICKNESS WITH ATRIAL ARRHYTHMIAS RECURRENCES POST ATRIAL FIBRILLATION ABLATION

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Background and aim: Catheter ablation is an effective rhythm control approach for managing atrial fibrillation (AF). Nevertheless, its recurrence rate remains high (20-30%), and the underlying mechanisms are unclear. Atrial remodeling significantly impacts AF progression. The varying thickness of the left atrial wall affects ablation success. Our study aimed to clarify the relationship between left atrial wall thickness and atrial arrhythmia recurrences after ablation.

Material & Methods: We enrolled 127 patients with a history of AF catheter ablation (January 2018 to January 2023). Recurrences were defined based on atrial tachyarrhythmia detected via electrocardiogram and Holter monitoring. Left atrial wall thickness was assessed using cardiac CT scans. Statistical analysis explored the association between thickness and arrhythmia recurrences.

Results: Among post-ablation AF patients (mean age 55, 64% male), paroxysmal AF was most common (65%). Multivariate analysis showed that left atrial wall thickness from CT scans (OR 1.56; 95% CI 1.20-2.03; $p < 0.001$) and left atrial diameter from echocardiography (OR 1.07; 95% CI 1.00-1.14; $p < 0.0038$) significantly correlated with atrial arrhythmias recurrences.

Conclusion: The left atrial wall thickness assessed with a CT scan is associated with atrial arrhythmia recurrences post-AF ablation.

Keywords: atrial fibrillation, left atrial wall thickness, recurrences, catheter ablation

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ATRIAL ELECTROCARDIOGRAM AND ELECTROPHYSIOLOGY PROPERTIES AS EARLY PREDICTORS OF ATRIAL FIBRILLATION IN WOLFF-PARKINSON-WHITE

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Background and aim: Atrial fibrillation in patients with WPW can induce malignant ventricular arrhythmias that results in sudden cardiac death. Patients with WPW are more likely to develop AF due to several mechanism such as atrial vulnerability. This study aimed to evaluate atrial electrogram and electrophysiology characteristics of WPW patients that develop AF.

Material & Methods: This is a case-control study included 2 groups of WPW patients which are inducible AF and non-inducible AF during EP study in the period of January 2018-June 2024 in National Cardiovascular Centre Harapan Kita. A total of 80 patients (15 in AF groups, 65 in non-AF groups) were recruited. Patients with incomplete of ECG and EPS data were excluded. ECG data prior to EPS and EPS data were collected and compared between two groups. Primary outcomes were comparison of ECG data (P-wave dispersion, P-wave duration, and P-wave terminal force in V1) and EPS (atrial ERP and AP ERP). P wave dispersion defined as difference between widest and narrowest P wave in 12-lead ECG.

Results: We found that WPW patients that have P wave duration $\geq$ 120 ms are more likely to develop AF (91,7% in AF groups compared to 16,7% in non-AF groups, p <0,001). Patients with p wave dispersion $\geq$ 40 ms are also more likely to develop AF (50% in AF groups compared to 11,1% in non-AF groups, p <0,001). We also found that AP retrograde ERP was significantly lower in patients who develop AF (255$\pm$41 ms in AF vs. 290 $\pm$ 95 in non-AF, p=0,03). Atrial ERP was little higher but in AF group but non significantly different between the two groups (233$\pm$ 29 ms in AF compared to 218$\pm$26 in non-AF, p=0,09). Linear regression analysis showed that the only parameters associated with AF in WPW patients was P wave duration (p<0,01). There was no significant difference of P wave terminal force in V1 between the two groups.

Conclusion: We found that patients with WPW that develop AF tends to have longer P wave duration, higher number of p wave dispersion $\geq$40 ms, and lower AP retrograde ERP that may serve as predictors of AF in WPW patients.

Keywords: atrial electrocardiogram, atrial electrogram, atrial fibrillation, WPW

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IMPLICATIONS OF STRICT AND LENIENT HEART RATE CONTROL ON REHOSPITALIZATION RATE, QUALITY OF LIFE, AND FUNCTIONAL CAPACITY IN ATRIAL FIBRILLATION PATIENTS WITH RHEUMATIC MITRAL STENOSIS: MULTI CENTER RANDOMIZED CONTROL TRIAL (RACE-MS TRIAL PILOT STUDY)

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Background and aims: Atrial fibrillation (AF) a common complication of rheumatic mitral stenosis (MS), often leads to poor prognosis and increased rehospitalization. Management involves anticoagulant and heart rate control, but studies show no difference in outcome between strict and lenient heart rate control in general AF. We aimed to assess the effect of strict and lenient heart rate control on rehospitalization rate, quality of life (QoL), and functional capacity in AF patients with MS.

Materials and methods: A prospective multicenter study enrolled AF patients with moderate-severe rheumatic MS in East Java from March 2023 to September 2023. Patients were divided into strict (60-80 bpm) and lenient heart rate (81-110 bpm) groups, with medication adjusted to achieve target heart rate. Clinical outcomes were assessed at baseline and three months followup, including rehospitalization rate, QoL (SF-36 questionnaire), and functional capacity (six minute walking test, SMWT) improvement between strict and lenient heart rate groups.

Results: A study involving 61 patients found significant differences in quality of life between strict and lenient heart rate groups in general health perception and physical function ($p = 0.002$). However, no significant differences were found in physical limitations, body pain, social function, emotional limitations, mental health, and vitality. Functional capacity evaluations showed no discernible difference between the two groups based on distance, VO2 max, and METs ($p = 0.135$; $p = 0.426$; $p = 0.429$).

Conclusion: The study found significant differences in quality of life between strict heart rate and lenient heart rate groups in general health perception and physical function, but no significant difference in other quality of life groups and functional capacity assessment.

ClinicalTrials.gov Number: NCT06409533
Keyword: Strict and Lenient Heart Rate, Rheumatic Mitral Stenosis, Atrial Fibrillation

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THE POTENTIAL OF TNF-ALPHA SIGNALING PATHWAY INHIBITION BY SODIUM-GLUCOSE CO-TRANSPORTER 2 INHIBITORS AS A POTENTIAL TREATMENT FOR ATRIAL FIBRILLATION RELATED TO METABOLIC SYNDROME: A BIOINFORMATIC ANALYSIS STUDY

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Background and aims: Metabolic syndrome (MetS) is a major risk factor for the development of Atrial Fibrillation (AF). Sodium-glucose co-transporter 2 inhibitors (SGLT2-i) have demonstrated a beneficial effect in preventing AF associated with MetS. However, the pharmacological mechanism is not clear. This study aimed to investigate the mechanisms of SGLT2-i in patients with AF and MetS, we performed target prediction and network analysis by a network pharmacology method.

Materials and methods: We identified targets of SGLT2-i (Empaglifozin and Dapaglifozin) and AF status in individuals with MetS from several databases and studies. The networks "Drug-Target" and "Drug-Target-Disease" were created using Cytoscape. The protein-protein interaction (PPI) was examined utilizing the STRING database. Analyzed Gene Ontology (GO) biological functions and Genomes (KEGG) pathways using the Shiny GO 0.80 tool.

Results: The study reveals that SGLT2-i, a drug used to treat AF and MetS, suppresses the TNF and AGE-RAGE signaling pathways, leading to 53 common target-drug-disease interactions. SGLT2-i targets p38 and JNK to disrupt MetS-related AF, which are key activators of the Mitogen-Activated Protein Kinase (MAPKs) pathway. Three primary pathways in mammals are ERK1/2, JNK, and the p38 pathway.

Conclusion: Our data suggests that SGLT2-i may effectively treat AF associated with MetS via inhibiting the TNF-alpha signaling pathway. Further research on the pharmacological mechanism of SGLT2-i in treating AF with MetS is required.

Keywords: Atrial Fibrillation, Metabolic Syndrome, SGLT2-i, TNF-a signaling pathway

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THE ACUTE SUCCESS RATE OF RIGHT-SIDED ACCESSORY PATHWAY ABLATION WITH VARIOUS RADIOFREQUENCY ABLATION STRATEGIES.

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Background and aims: Right sided accessory pathway (AP) was found in 30-40% of Wolf-Parkinson White (WPW) syndrome and yet is considered harder to ablate related to more complex anatomical feature of the tricuspid annulus. Various ablation techniques strategies were applied in right sided AP ablation. This study intended to compare various strategies in efficacy and efficiency of right sided AP ablation.

Materials and methods: All patients with documented right sided AP from electrophysiology study and had undergone conventional radiofrequency ablation were included in this study. The RFA strategies were divided into mapping strategies (point by point (PbP) using ablation catheter VS simultaneous mapping using duodecapolar (Halo) catheter), sheath selections (standard sheath VS long sheath), and catheter selections (non-irrigated VS irrigated catheter). The acute success is defined as elimination of delta wave and absence of retrograde conduction through the AP after ablation. Fluoroscopy time (minutes) and radiation dose (mGycm2) were measured and compared among different strategies.

Results: There were 42 patients took part in this study, with male predominance (54.8%). Most patients (90%) had manifest pre-excitation during sinus rhythm. Right lateral AP was the most frequent AP in this study, accounted for 35% (15 cases) of the study population. Most patients had only one AP, and only 4.8% (2 cases) had multiple APs. The acute success rate in all cases was 88% (37 cases), with 73% of the successful ablated group had a retrograde block after ablation. Mapping strategies were not significantly different in reaching acute success (PbP vs Halo; 93% vs 85% respectively, p value:0.503). The same findings were also discovered in sheath (standard vs long sheath; 90.5% vs 85.7% respectively, p value: 0.50) and catheter selections (non-irrigated vs irrigated ablation catheters; 92.3% vs 86.2% respectively, p value:0.275). Radiation dose and fluoroscopy time were also unaffected by mapping strategies [radiation(PbP vs Halo; 29,482 vs 40,700, p value :0.198) Fluorotime (PbP vs Halo; 57.4 $\pm$31.6 vs 77.7 $\pm$ 37.7, p value: 0.09)], sheath selections [radiation dose(standard vs long sheath; 30,405 vs 51,397, p value :0.217) Fluorotime (standard vs long sheath; 73.8 $\pm$39 vs 67.8 $\pm$ 34.9, p value: 0.61)], and catheter selections [radiation dose(non irrigated vs irrigated catheter; 32,725 vs 35,919, p value :0.751) Fluorotime (non irrigated vs irrigated catheter; 69.4 $\pm$34.6 vs 72.7$\pm$ 40.8, p value: 0.78)]

Conclusion: The acute success rate of right sided AP RFA was 88% and was not affected by mapping strategies, catheter selections, and sheath selections. The fluoroscopy time and radiation dose for each groups remain insignificantly different.

Keywords: Right sided accessory pathway, radiofrequency ablation, accessory pathway ablation acute success rate.

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Atrial Myopathy: A Novel Frontier in Ischemic Stroke Prediction Beyond Atrial Fibrillation

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Background and aims: Atrial-Myopathy(AM), defined by structural changes and electrical abnormalities in the atria, is emerging as a significant predictor of ischemic-stroke(IS) independent of atrial-fibrillation(AF). Advanced imaging modalities, such as speckle-tracking-echocardiography, facilitate early detection by identifying atrial dysfunction. This study aims to investigate the association between left-atrial(LA) clinical parameters and IS. This study aims to investigate the association between LA clinical parameters and IS.

Materials and methods: This cross-sectional study analyzed data from ischemic stroke patients at the National Brain Center Hospital between 2019 and 2023. Our study consisted of 298 patients, divided into IS(n=155) and non-IS(n=143) groups. IS diagnosis was based on clinical symptoms and head CT scans. Control subjects were selected from routine echocardiography patients with no history of stroke or AF. Statistical analyses, including p-value-calculation and T-test were performed to compare mean differences in LA functional parameters using STATA-14.2. The cut off value for AM diagnosis was determined using the Area Under Curve(AUC) analysis based on LA-reservoir-strain.

Results: The study population had a mean age of 63.71±11.05 years, with 36.13% female. Baseline characteristics showed no significant differences between groups(Table-1); however, all left atrial parameters demonstrated significant differences between the IS and non-IS groups(Table-2). AUC analysis of Emptying-Fraction(EF), Reservoir-Strain(ReSt), Global-Longitudinal-Strain(GLS), Left-Atrial-Volume(LAV), Left-Atrial-Volume index(LAVi), and Atrial-Functional-Remodeling-index(AFRi) between 2 groups yielded the following results: 0.666(95% CI [0.60-0.73]), 0.687 (95% CI [0.63-0.75]), 0.685(95% CI [0.62-0.75]), 0.579(95% CI [0.51-0.64]), 0.609(95% CI [0.54-0.67]), and 0.665(95% CI [0.60-0.73]) respectively (Table-3). After adjustment, four predictors were significantly associated with ischemic stroke: age (OR 3.30; 95% CI [1.89-7.93]), hypertension (OR 2.99; 95% CI [1.41-6.36]), current smoking (OR 3.84; 95% CI [1.62-9.12]), and LA-ReS (OR 2.49; 95% CI [1.49-4.17]) (Table-4).

Conclusion: Our findings indicate that deterioration in left atrial parameters may enhance stroke risk stratification in patients without atrial fibrillation.

Keywords: Atrial Myopathy, Ischemic Stroke, Predictor, Atrial Fibrillation

Table 4. Univariate and Multivariate Regression Analysis

Variable	Non Stroke	Stroke	Univariate		Multivariate	
			Odds Ratio (95% CI)	p-value	Odds Ratio (95% CI)	p-value
Age (y.o) mean±SD ≥54	61.55±11.27 104 (73.24)	65.95±10.68 139 (89.68)	- 3.17 (1.62-6.42)	0.0006 0.0002	3.30 (1.89-7.93)	<0.0001
Body Surface Area	1.75±0.20	1.70±0.19	-	0.06	-	
Body Mass Index Obesity	26.14±4.12 82 (57.34)	25.50±4.04 73 (47.10)	- 0.66 (0.41-1.07)	0.18 0.077	- 0.72 (0.44-1.18)	0.19
Female	52 (36.88)	56 (36.13)	0.97 (0.59-1.59)	0.89	1.09 (0.65-1.85)	0.73
Hypertension	108 (75.52)	142 (91.61)	3.54 (1.72-7.63)	0.0002	3.87 (1.89-7.34)	<0.0001
Diabetes Mellitus	24 (16.78)	45 (29.03)	2.03 (1.12-3.72)	0.012	1.72 (0.95-3.13)	0.073
Coronary Heart Disease	22 (15.38)	26 (16.77)	1.11 (0.57-2.17)	0.74	1.06 (0.53-2.14)	0.87
Smoking	11 (7.69)	32 (20.65)	3.12 (1.45-7.15)	0.002	3.76 (1.70-8.29)	<0.0001
Dyslipidemia	46 (32.17)	50 (32.26)	1.00 (0.59-1.68)	0.990	0.99 (0.58-1.71)	0.99
Left Atrial Reservoir Strain - >21.90 - ≤21.90	100 (69.93) 43 (30.07)	77 (49.68) 78 (50.32)	2.36 (1.42-3.91)	0.0004	2.49 (1.49-4.17)	0.001

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Size matters: increased left atrial volume index relates to new-onset atrial fibrillation in myocardial infarct patients

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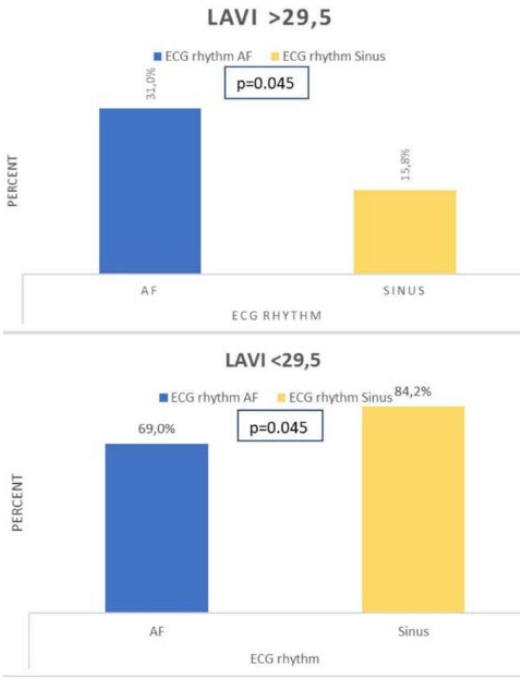
Background and aims: Atrial fibrillation can impair ventricular filling, disrupt hemodynamics, and interfere with coronary circulation in patients with myocardial infarction (MI), even after revascularisation. It has been reported that patients with disrupted diastolic function might have a higher risk of developing atrial fibrillation (AF) after MI revascularisation. Increased left atrial volume indexed to body surface area (LAVi) has been known to be positively correlated with worse diastolic dysfunction. Therefore, this study examines the correlation between LAVi and the incidence of AF in MI patients after revascularisation.

Materials and methods: This is a retrospective cohort study conducted in adult patients with MI after revascularisation who were admitted to Sardjito Hospital between June 2022 and July 2023. Both electrocardiography and echocardiography were performed within 24 hours following revascularization. Increased LAVi in this study is defined as over 29.5 mm/m2 based on cut-off points of Receiver Operating Characteristic analysis. New-onset AF was recorded within 1 year follow-up period through outpatient visits. Data were analysed using a chi-square test and significance was set at the level of $p < 0.05$.

Result: There were 225 patients enrolled in this study, the mean age was 59.52 years. There were more males (182 patients, 80.89%) than females (43 patients, 19.11%). New-onset AF was found in 29 patients (12.89%) while increased LAVi of over 29.5 mm/m2 was found in 40 patients (17.78%). Among patients who developed new-onset AF, 9 patients (31.03%) had increased LAVi. In contrast, only 31 patients (15.81%) who did not develop new-onset AF had increased LAVi. In MI patients who have underwent revascularisation, those with increased LAVi had an increased relative risk of developing new-onset AF compared to patients who had normal LAVi (RR = 2.08, CI: 1.02–4.22, p=0.045).

Conclusion: This study shows that increased LAVi is correlated with an increased risk of developing new-onset AF in MI patients following percutaneous intervention. This finding shows that ubiquitous modality such as echocardiography can be used to predict diastolic dysfunction, which is a strong predictor of morbidity and mortality, especially in MI patients

Keywords: Myocardial infarction, Atrial Fibrillation, Left Atrium Volume Index, LAVI, Echocardiography



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Insight of Prophylactics Antibiotics Duration Toward Healing and Risk of Infection In Cardiovascular Implantable Electronic Device Infection (PACE-PRO Trial) in Saiful Anwar General Hospital Malang

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Background and Aims: The implantation of a cardiovascular electronic device (CIED) is often a surgery that saves lives. Administering prophylactic antibiotics as a preventive measure is an effective technique for reducing the risk of infections. However, the ideal length of time for administering preventive antibiotics for CIED in Indonesia is yet unknown. The individual research findings are inconclusive and subject to debate because each institution has its own guideline dictating the protocol for prophylactic antibiotic usage. The objective of this study is to evaluate and compare the efficacy of two commonly prescribed antibiotic durations in preventing infections after PPM implantations.

Materials and methods: This study is a prospective single-center cohort investigation aimed at examining the variation in clinical results, specifically CIED infection rates. This study will recruit patients scheduled to undergo CIED implantation and randomly allocate them to receive either a single dose or a three-day regimen of antibiotics. The antibiotic selection will be determined according to our institutional protocols, with 1 gram of intravenous Cefazolin (a first-generation cephalosporin). The primary outcome is to observe any early pocket infection, late pocket infection, or infective endocarditis related to CIED implantation over a designated period of time. Another secondary outcome was evaluated using clinical assessments, laboratory analyses, and imaging investigations to identify another sign of infection related to CIED implantation. This study protocol was registered at ClinicalTrials.gov with ID NCT06355115.

Result: The cohort study has enrolled 63 participants from September 2023 until May 2024 and divided them into two groups with single dose antibiotic and three-day dose of antibiotics. We found only 1 patient who developed a superficial infection after CIED implantation. The incidence of infectious complications did not show a significant difference between the two antibiotic regimens (3.2% vs. 0%; $p > 0.05$).

Conclusion: In our studies, the effectiveness of using single-dose prophylactic antibiotics to prevent CIED-associated infections was comparable over a period of three days of antibiotics. We suggest another medical center could replicate this protocol to optimize antibiotic doses for patients undergoing CIED implantation.

Keywords: Antibiotics Prophylaxis, Cardiovascular Implantation Electronic Device, CIED, Infections

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Prognostic Risk Index of Developing Lethal and Non-Lethal Arrhythmias Following Coronary Artery Bypass Grafting among Patients with Ischemic Cardiomyopathy

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Background and Aims: Several evidence prior to the surgical revascularization (HEART, REVIVED-BCIS2, STITCH, PARR-2) still remains controversial, however number of patients with reduced ejection fraction secondary to ischemic cardiomyopathy (ICM) who underwent coronary artery bypass grafting tends to increase. The study objectives were to determine the incidence, predictors, and clinical impact of lethal and non-lethal cardiac arrhythmias after coronary artery bypass grafting.

Materials and methods: We enrolled purposive sampling of 162 patients with baseline left ventricular ejection fraction less/equal than 40% without known history of ventricular arrhythmias, who underwent coronary artery bypass grafting between 2021 until 2023. Twenty-four-hour electrocardiography was recorded from the preoperative day to the 5th postoperative day.

Results: The incidence of lethal ventricular arrhythmias in this study was 35.18% (57/162), including ventricular extrasystole, supraventricular tachycardia, new-onset atrial fibrillation, and ventricular tachycardia. Ventricular arrhythmias occurred mostly during 0-2 hours after coronary artery bypass grafting. Supraventricular tachyarrhythmias were mostly encountered 24 hours after coronary artery bypass grafting. Multivariate logistic regression showed that age, operative time > 4 h, left ventricular internal diameter end diastole > 60 mm, mean arterial pressure <70 mmHg, body mass index > 23 kg/m^2, and use of insulin were independently associated with lethal ventricular arrhythmias after isolated coronary artery bypass grafting.

Conclusion: Lethal and non-lethal arrhythmias affect significant proportion of patients with ischemic cardiomyopathy undergoing coronary artery bypass grafting, most frequently within 6 months postoperatively. To prevent sudden cardiac death, earlier implantable cardioverter defibrillator implantation should be indicated for high-risk patients for lethal ventricular arrhythmias before undergoing surgery.

Keywords: coronary artery bypass grafting, ischemic cardiomyopathy, lethal arrhythmia, non-lethal arrhythmia, sudden cardiac death

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HIGH BURDEN IDIOPATHIC INFERIOR AXIS PREMATURE VENTRICULAR CONTRACTION (PVC) AND RIGHT VENTRICULAR PVC-INDUCED CARDIOMYOPATHY

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Background and Aims: High burden premature ventricular contractions (PVC) could be a risk factor for right ventricular (RV) dysfunction as similar to left ventricular dysfunction in general. There has been very limited study that analyzed how large burden percentage of idiopathic PVC that could lead to RV dysfunction. The study aim was to analyze the association between idiopathic inferior axis PVC burden percentage and RV dysfunction using speckle tracking echocardiography.

Materials and Methods: From January 1st to March 31st, 2023, a cross-sectional observational study of 24 patients with a high burden of idiopathic inferior axis PVC underwent right ventricular global longitudinal strain (GLS) and free wall longitudinal strain (FWLS) using speckle tracking echocardiography in outpatient clinic of National Cardiovascular Center Harapan Kita (NCCHK). Using right ventricular GLS and FWLS, a statistical analysis was done to determine the association between the percentage of idiopathic inferior axis PVC burden and RV dysfunction.

Results: The percentage of females in the 24 research subjects was larger than males (17 vs 7 sample), with the majority of PVC morphology being inferior axis and left bundle branch block (LBBB) morphology (83.3%). In this study cohort, the average proportion of PVC burden was 18.6 ± 9.6%. The percentage of PVC burden was found to be associated with RV dysfunction by RV GLS parameters (p = 0.031) and got best PVC burden value at 17% as cut off for RV dysfunction (AUC 73.9%, p = 0.05), but multivariate analysis revealed no further independent association with RV dysfunction (p = 0.063, OR 1.18, 95% CI 0.99 - 1.41). In both bivariate and multivariate analyses, the PVC had no association to RV dysfunction by RV FWLS parameters.

Conclusion: Individuals with a high burden of idiopathic inferior axis PVC had a risk to develop subclinical RV dysfunction according to RV GLS parameters by speckle tracking echocardiography.

Keywords: *Premature Ventricular Contraction, Right Ventricular Dysfunction, Global Longitudinal Strain, Free Wall Longitudinal Strain*

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Correlation Between QRS Duration and Left Ventricular Systolic Function Based on 4D Echocardiography Quantification in Patients with Ischemic Cardiomyopathy

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Background and aims: Cardiomyopathy is the leading cause of Heart Failure, which carries high riks of mortality and morbidity. Ischemic cardiomyopathy (ICM) is mainly characterized by myocardial ischemia, degeneration, necrosis, fibrosis, scar formation and impaired left ventricle (LV) function with disease progression to heart failure. Prolongation of QRS duration (QRSd) occurs in 14% to 47% of heart failure (HF) patients. Several studies have shown the prognostic role of prolonged QRSd in heart failure with reduced ejection fraction, supporting its use as a risk stratification tool. The aim of this study is to assess correlation between QRSd and LV systolic function based on 4D-Echocardiography parameters.

Materials and methods: This is a cross-sectional study including 84 patients with ICM in Prof. Dr. R. D. Kandou general hospital with LV ejection fraction (LVEF) ≤ 40%. QRSd in lead II ECG was measured from the start of Q wave to end of S wave. LV systolic function based on 4D echocardiography quantification were measured by 4D-LVEF parameter, and speckle tracking echocardiography parameters including global longitudinal strain (GLS), global area strain (GAS), global circumferential strain (GCS), and global radial strain (GRS). All parameters are analyzed using SPSS version 25.

Results: Among 84 research subjects 71% patients were male with an average age of all subjects 61 years old. Mean QRSd 91.6 ± 23.8 msec and mean 4D-LVEF 28.1±7.7%. Median GLS -5(4 IQR), median GAS -8(7.5 IQR), median GCS -5(4 IQR) and median GRS 10(9.75 IQR). There are significant correlation between QRSd and LV systolic function based on 4D echocardiography parameters using pearson correlation test and regression analysis.
Conclusion: The longer QRSd in patients with ischemic cardiomyopathy is associated with the worsening of LV systolic function measured by 4D echocardiography parameters

Keywords: QRS Duration, LVEF , Ischemic cardiomyopathy

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Acute and long-term outcomes of idiopathic left ventricular tachycardia (ILVT) treated by radiofrequency catheter ablation (RFA)

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Background and aims: Idiopathic left ventricular tachycardia (ILVT) is a common type of ventricular arrhythmia in Asian population. Successful ablation of these tachycardia can be performed at the site of the earliest Purkinje potential or at the site with recording of diastolic and presystolic Purkinje potentials simultaneously during ventricular tachycardia (VT). This study will demonstrate the acute and long-term outcomes of ILVT ablation during sinus rhythm and VT.

Materials and methods: Patients who had underwent ILVT catheter ablation at the National Cardiovascular Center Harapan Kita between 2018 and 2024 were enrolled. Activation mapping was performed to identify the earliest presystolic Purkinje potential during VT and sinus rhythm then was targeted by radiofrequency ablation. The primary endpoint is defined as the acute outcome and the secondary endpoint is defined as the long-term freedom from VT during follow-up period.

Results: A total of 43 patients was included (mean age 30.6±13.6 years old, 72% men, 3 had ejection fraction < 30%). ILVT involved the left posterior in 40 patients, left anterior fascicle in 2 and upper septal in 1. VT was inducible in all but 1 patient by ventricular stimulation (65.1%) and spontaneously (32.5%). Ablation procedures were performed without 3D electro-anatomical mapping in 60.4%, transeptal puncture was done in 10 patients. During procedures, mapping and ablation was performed during VT (Group 1: 18 [41.8%]) and sinus rhythm (Group 2: 25 [58.1%]). Primary endpoint was achieved in all but 7 patients (83%) with no significant difference between group 1 and 2 (83.3% vs. 84% respectively [p 0.634]). During a mean follow-up period of 32.3 months, the secondary endpoint rate was also similar between the 2 groups (80% in group 1 vs. 76.1% in group 2[p 0.559]). None of the patients experienced any acute complication after the procedure. Antiarrhythmic drugs were still required in 9/28 of whom that are clinically free from ILVT.

Conclusion: Catheter ablation of ILVT is associated with acute procedural success rate of 83% and freedom from ILVT of 77%. There was no significant difference in primary and secondary endpoints between the group that received ablation during VT and during sinus rhythm.

Keyword: Idiopathic Ventricular Tachycardia, Radiofrequency Catheter Ablation

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Incidence of the retrograde block during slow pathway ablation in Atypical slow-slow atrioventricular nodal reentrant tachycardia

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Background and Aims: Atrioventricular nodal reentrant tachycardia (AVNRT) are the most common regular supraventricular tachycardia. AVNRT should be classified as typical or atypical. Slow pathway ablation is the accepted first-line treatment. We assessed responses to slow pathway ablation concerning the appearance of the retrograde block during slow pathway ablation in atypical types slow-slow of atrioventricular nodal reentrant tachycardia.

Methods and results: This study is a retrospective study with collective data in our department from 2018-2024. We identified 14 patients with a slow-slow type of atypical AVNRT. The basic characteristic is age 43.50 ± 11.210 years old and the 8 subjects are female. During atypical AVNRT, the Tachycardia cycle length was 352.14 ± 75.073 ms, PPI-TCL > 115 ms, the VA interval was prolonged 151.21 ± 33.041 ms (>70 ms), RVOP maneuver showed VAV, HRVPB showed no reset, and the earliest atrial activation was located around the coronary sinus (CS) ostium. Slow pathway ablation was performed using multiple RFA. Incremental ventricular pacing 20 minutes after ablation, AVNRT became non-inducible, and the 8 (57%) patients preserved retrograde block conduction.

Conclusion: In patients with atypical AVNRT, retrograde block during slow pathway ablation is commonly observed and indicates the success of the ablation of retrograde slow pathway conduction but has no relation to the risk of subsequent AV block.

Keywords: Ablation, Atrioventricular nodal reentrant tachycardia, slow pathway, retrograde block.

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Unveiling the Impact of Ramadan Fasting on Autonomic Nervous System Dynamics in Patients with Stable Coronary Artery Disease: Back to Basic Electrocardiography

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Background and aims: Rebalancing the autonomic nervous system is a crucial part of treating stable coronary artery disease. Dietary plans including fasting have been shown to play a beneficial role in improving the balance of the autonomic nervous system. In this study, we investigated the effect of Ramadan fasting on basic electrocardiography parameters in patients with stable coronary artery disease.

Materials and methods: This is a quasi-experimental study conducted on a group of subjects with stable coronary artery disease on beta blocker therapy. Electrocardiography examinations were conducted twice: once during Ramadan after fasting for at least 10 days, and later, at least 1 month after Ramadan, in a non-fasting state. The following parameters were thoroughly studied: P wave duration, QRS duration, PR interval, QT interval, R-R interval, P voltage on lead II, and QRS voltage on lead V5. Means of each parameter were compared using paired T-tests.

Results: Twenty-four subjects were recruited, including 19 males and 5 females, aged 44 to 72 years (mean 60 ± 7.0 years), with an established diagnosis of coronary artery disease by angiography. A significant increase in the PR interval was observed during fasting (196 ± 31 vs 175 ± 30 milliseconds, p=0.03). Other changes in electrocardiography parameters were not statistically significant.

Conclusion: Ramadan fasting is associated with a significant increase in the PR interval. This result suggests a dromotropic shift through autonomic nervous system modulation in patients during the fasting state. Further studies are needed to explore the effect of Ramadan fasting on autonomic system dynamics in patient with coronary artery disease with more sophisticated parameters.

Keywords: Ramadan fasting, autonomic nervous system, stable coronary artery disease, electrocardiography, PR interval

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Association between fine particulate matter and ventricular high-rate episode (VHRE) in patients with cardiac implantable electronic devices

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Background and aims While atrial high rate episodes (AHREs) are crucial to recognize because AHRE is considered a harbinger of atrial fibrillation, a prominent risk factor for stroke, ventricular high-rate episodes (VHREs) may also occur and identify patients experiencing non-sustained ventricular tachycardia (NSVT) or sustained ventricular tachycardia. Recent studies have suggested that exposure to particulate matter ($PM_{2.5}$) increases the incidence of subclinical arrhythmia. However, evidence regarding the association between $PM_{2.5}$ exposure and subclinical arrhythmia is limited, especially in patients with cardiac implantable electronic devices (CIED).

Materials and methods We conducted a nationwide cross-sectional study using data from eight multicenter cohort studies. Using generalize estimating equation (GEE), we assessed the association between air pollution, such as $PM_{2.5}$, PM_{10}, O_3, NO2, SO2 and CO, and subclinical arrhythmia episode, including AHREs and VHREs. These pollutants were estimated using high-resolution and high-quality spatiotemporal datasets of Air Korea's daily air pollutants.

Results Among the 22,793 eligible episodes, we identified 98 patients with subclinical arrhythmia, of whom 631 experienced atrial arrhythmia episodes, and 201 had ventricular arrhythmia occurrences. Of the air pollutants, SO2 showed a significant positive association with the risk of overall arrhythmia, while no air pollutants showed a significant association with atrial arrhythmia risk. PM2.5, NO2, SO2, and CO were statistically significantly associated with an increased risk of ventricular arrhythmia (odds ratio (OR), 1.038; 95% confidence interval (CI), 1.009-1.067; OR, 1.159; 95% CI 1.044-1.296; OR 2.278; 95% CI 1.105-4.696; and OR, 1.006; 95% CI, 1.002-1.010, respectively), while O3 was significantly associated with a low risk (OR 0.914; 95% CI 0.841-0.993).

Conclusion These results suggest a statistically significant association between particulate matter and a higher risk of ventricular arrhythmia occurrence. Further retrospective studies using nationwide claims data and prospective studies are warranted.

Keyword: particulate matter, ventricular high-rate episodes, cardiac implantable electronic devices, subclinical arrhythmia episode

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Validation of Namdar Electrocardiographic Diastolic Index for Diagnosing Left Ventricular Diastolic Dysfunction in Patients with Hypertension

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Background and aims: Left ventricular diastolic dysfunction (LVDD) is a prevalent condition in hypertensive patients, often preceding the development of heart failure. Early diagnosis of LVDD is critical for the prevention and management of subsequent cardiac events. The electrocardiographic (ECG) diastolic index by Namdar (2013), which is calculated from 12-lead ECG, could recognize the patient with LVDD. This study investigates the validity of the Namdar ECG score as a diagnostic tool for LVDD in hypertensive patients.

Materials and methods: This study was a-single centre, retrospective study, included 50 consecutive patients with hypertension between January – December 2023. Each participant underwent ECG examination and standard transthoracic echocardiography (TTE). TTE measurement such as the E/A ratio, E/e' ratio, and left atrial volume index (LAVI) were used as reference standards for diagnosing LVDD. Then, patients were categorized as LVDD and no LVDD group. The Namdar electrocardiographic index was calculated by using formula: Tend-P segment / (PQ interval x age). Patients with other cardiac abnormalities and missing hospital data were excluded. Statistical analyses, including correlation studies and receiver operating characteristic (ROC) curve analysis, were performed.

Results: The patients were categorized into two groups based on the presence of LVDD. The mean age of the study was 57 ± 11 years, with 14 patients (28%) were male. Compared to no LVDD group, LVDD group had significantly lower in Tend-P segment (0.28 $\pm$ 0.14 vs 0.33 $\pm$ 0.12, p= 0.04) and Namdar ECG score (0.03 $\pm$ 0.15 vs 0.44 $\pm$ 0.02, p= 0.03). No difference in PQ interval between two groups (0.18 $\pm$ 0.05 vs 0.16 $\pm$ 0.04, p= 0.153). Namdar ECG score had moderate negative correlation with LVDD (r= -0.543, p= 0.015) and had good discriminatory power with LVDD as well (AUC 0.712; 95%CI 0.543 – 0.882, p= 0.016). We found Namdar ECG score with cut-off $\leq$ 0.033 had sensitivity 75% and specificity 67.65% in diagnosing LVDD (OR 1.78; 95%CI 1.13 – 2.8).

Conclusion: This study confirms the validity of the Namdar Electrocardiographic Diastolic Index as a reliable diagnostic tool for detecting left ventricular diastolic dysfunction in patients with hypertension.

Keywords: Namdar electrocardiographic score; diastolic dysfunction; hypertension

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TYPES AND LOCATIONS OF ST-SEGMENT CHANGES AND IMPACT ON MORTALITY OF COVID-19 PATIENTS IN REFERRAL HOSPITALS IN EAST JAVA

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Background and aim: Myocardial injury is one of the most common complications in COVID-19 patients, indicated by ST-segment changes in ECG findings. ST-segment changes were shown to have higher association with severe prognosis and higher mortality rate. With significant association between ST-segment changes and possible prognostic factors in COVID-19 patients, a comprehensive approach is needed to enhance the survival rate through a better understanding of the aforementioned association.

Materials and methods: We identified 562 confirmed COVID-19 data in East Java between March 2020 to April 2021. Electrocardiograph (ECG) findings of each patient were examined to find which type and location of ST-segment changes were most significantly correlated to mortality. Results: After multivariable adjustment and stepwise elimination, six of 22 variables: gender (p = 0.02), age (p = <0.01), anterior ST elevation (p = <0.01), anteroseptal ST elevation (p = <0.01), upsloping ST depression (p = <0.01), and coronary heart disease (p = 0.04) were found significant towards mortality.

Conclusion: We concluded that anterior and anteroseptal ST elevation and upsloping ST depression have worse prognosis thus higher mortality rate in COVID-19 patients compared to other types and locations of ST changes. Further studies are required to enhance the improvement of care coordination.

Keywords: COVID-19, ECG, ST-segment changes, Mortality

COI disclosure: Nothing to disclose

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Earliest activation vs pace mapping: the better predictor for successful catheter ablation in idiopathic premature ventricular complex

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Background and aims: The identification of premature ventricular complex (PVC) origin is paramount in determining radiofrequency catheter ablation (RFCA) success. During ablation, triggered activity that underlies the pathology of PVC is identified at a focal tissue area that precedes QRS onset, thus termed as the earliest activation. Subsequently, the presence of stimulated ventricular arrhythmia (VA) is examined for its similarity to clinical VA using pace mapping. Although both methods are important, in some cases, the identified site using earliest activation did not produce VA with enough similarity according to pace mapping, and vice versa. The aim of this study is to compare the sensitivity and specificity of activation and pace mapping as a predictor to successful PVC ablation.

Materials and method: This retrospective cohort study analyzed patients with idiopathic PVC undergoing RFCA in a single health center from the period of December 2018 to April 2024.

Results: A total of 67 patients were included in this study. RFCA was done using a 2D mapping system in 37 patients (56.7%). Forty-three patients (64.1%) had a successful ablation. During RFCA, 53 patients (79.1%) were identified with PVC originating from the right ventricular outflow tract (RVOT). PVC site of origin was associated with ablation outcome (p=0.014). Area under the curve (AUC) was observed larger in pace mapping compared to earliest activation (AUC of pace mapping = 72.8% (60%-85.6%) (p=0.002); AUC of earliest activation = 66.4% (52.6%-80.2%) (p=0.027)). The optimal cut-off value of earliest activation time was -35 ms with a sensitivity of 60.5% and specificity of 54.2%. Meanwhile, the optimal cut-off value of pace mapping was 98.5% with a sensitivity of 53.5% and specificity of 79.2%. However, since earliest activation and pace mapping generated different values, a direct comparison was not feasible. In addition, a separate analysis between different site of origin was not conducted.

Conclusion: In our center, the earliest activation had a better sensitivity while pace mapping had better specificity. Both activation mapping and pace mapping should be used in conjunction to achieve a successful PVC ablation.

Keywords: activation mapping, pace mapping, PVC, ablation

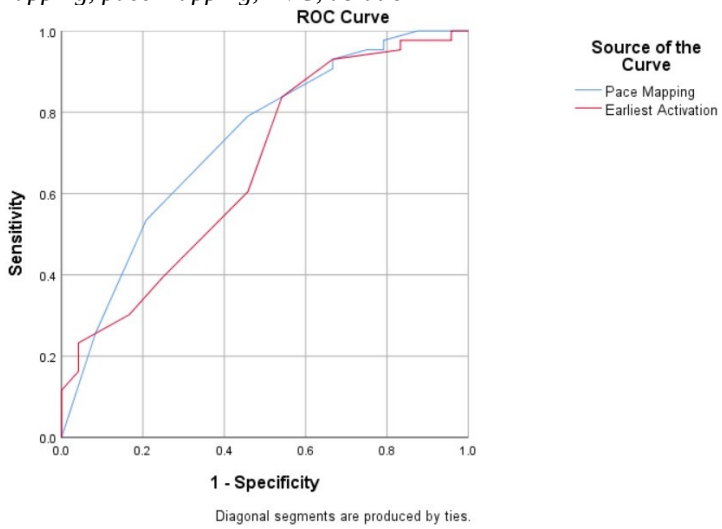

Figure 1. ROC curve for earliest activation time (red line) and pace mapping (blue line)

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Clinical Characteristic and Short Term Outcome of Conventional Premature Ventricular Complex Ablation in National Cardiovascular Center Harapan Kita

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Background and aims: Premature ventricular contraction (PVC) is a common arrhythmia that can affect quality of life. Conventional ablation remains one of the mainstay treatments for PVC. This study aims to present the clinical characteristic and short-term outcome of conventional ablation patients in National Cardiovascular Center Harapan Kita (NCCHK).

Materials and method: This is a retrospective observational study with data of patients that underwent conventional PVC ablation in NCCHK from June 2023 to May 2024. Short term outcome of success was determined from improvement in symptoms and evaluation of ECG 24 hours after the procedure and within 1 week of follow up outpatient visit.

Result: There was a total of 184 ablation procedures done, 76 (40.8%) was three-dimensional ablation and 108 (58.7%) was conventional ablation. Post procedure evaluation showed conventional ablation short term success rate of 80% (86 out of 108 patients). This study ultimately included 82 patients for clinical characteristics analysis due to missing data. Overall mean age was 43.7 (16-69) year-old with 68 (82.9%) females predominantly and 14 (17.1%) male patients. Hypertension (40.2%) was the most frequent comorbidity and betablocker as class II antiarrhythmic drugs (61.0%) was the most prescribed antiarrhythmic. Almost all patients (95.1%) had preserved ejection fraction with LVEF ≥50%. Mean PVC burden was 19.8% (5-50) with origin mostly from RVOT (82.9%). PVC transition zone was comparable (59.8% in ≤V3 and 40.2% in > V3) with no significant difference between successful and failed ablation group. There was no statistically significant difference of clinical characteristics between successful and failed ablation group.

Conclusion: This study provides clinical characteristics and short-term outcome of PVC patients that underwent conventional ablation in NCCHK. Female was the predominant gender, hypertension was the most prevalent comorbid, betablocker was the most prescribed drug and PVC mostly originated from RVOT. There was no statistically significant difference of clinical characteristics between successful and failed ablation result. The short-term success rate of conventional ablation was 80%.

Keyword: clinical characteristics, premature ventricular complex, conventional ablation

Table 1. Clinical characteristic of conventional ablation patients

Variable	Overall (n=82)	Success (n=61)	Failed (n=21)	p value
Age (years, range)	43.7 (16-69)	43.5	44.3	0.62
Gender				0.69
Male (n, %)	14 (17.1)	11 (18.0)	3 (14.3)	
Female (n, %)	68 (82.9)	50 (82.0)	18 (85.7)	
Comorbidity				
Hypertension (n, %)	33 (40.2)	25 (41.0)	8 (38.1)	0.81
Diabetes (n, %)	7 (8.5)	4 (6.6)	3 (14.3)	0.36
CAD (n, %)	5 (6.1)	2 (3.3)	3 (14.3)	0.10
Antiarrhythmic Drugs				0.7
Class I (n, %)	0	0	0	
Class II (n, %)	50 (61)	41 (67.2)	9 (42.9)	
Class III (n, %)	2 (2.4)	1 (1.6)	1 (4.8)	
Class IV (n, %)	13 (15.9)	8 (13.1)	5 (23.8)	
Combination (n, %)	4 (4.9)	2 (3.3)	2 (9.5)	
None (n, %)	13 (15.9)	9 (14.8)	4 (19)	
LVEF (%, SD)	62.8 ± 8.1	62.9 ± 8.0	62.3 ± 8.3	0.76
LVEF <50% (n, %)	4 (4.9)	3 (4.9)	1 (4.8)	1.0
LVEF ≥50% (n, %)	78 (95.1)	58 (95.1)	20 (95.2)	
PVC burden (%, range)	19.8 (5-50)	18.8	22.6	0.12
Mean HR (bpm, range)	79.7 (59-124)	80.1	78.6	0.26
Transition Zone (range)	3.3 (1-5)	3.2	3.6	0.18
≤V3 (n, %)	49 (59.8)	38 (62.3)	11 (52.4)	0.42
>V3 (n, %)	33 (40.2)	23 (37.7)	10 (47.6)	
Origin				0.33
RVOT (n, %)	68 (82.9)	52 (85.2)	16 (76.2)	
Others (n, %)	14 (17.1)	9 (14.8)	5 (23.8)	

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High-degree Atrioventricular Block in Pediatric Post-Cardiac Surgery: Recovery Rates, and Timing for Permanent Pacemaker Implantation Consideration

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Background and aim: AV block frequently develops following valve surgery, often necessitating the implantation of a permanent pacemaker (PPM) with an implantation rate as high as 7%. Yet, the frequency, and timeline of natural recovery of AV conduction in these individuals remain unclear in pediatric patients.

Materials and Methods: This was a single-center, retrospective study of patients <18 years old who underwent cardiac surgery between January 2019 and December 2023 and experienced post-operative high-degree atrioventricular block. Patient data, clinical characteristics and operative variables were collected and analyzed.

Result: Among 69 patients with a mean age of 4.25 years, who developed post-operative high-degree atrioventricular block, 55 patients (79.7%) experienced spontaneous recovery and converted to sinus rhythm. 19 patients (27.5%) with persistent high-degree atrioventricular block underwent permanent pacemaker implantation. During pacemaker reprogramming, 5 patients (26.3%) had a ventricular paced value <70%, indicating a recovered atrioventricular block. The time to spontaneous recovery from the onset of atrioventricular block varied: 34 patients (61.8%) converted to sinus rhythm within 7 days, and 12 patients (21.8%) converted within 14 days.

Conclusions: High-degree atrioventricular block may occur in pediatric patients following cardiac surgery. A 14-day period following the onset of AV block post-cardiac surgery is a suitable timeframe for evaluating the necessity of permanent pacemaker implantation.

Keywords: High-degree AV Block, Post Cardiac Surgery, PPM Implantation

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The Correlation Between Arrhythmia with Myocardial Injury Findings on Cardiac Magnetic Resonance

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Background and aims: Cardiovascular diseases are the leading cause of death globally. In Indonesia, myocardial infarction is the most common cause of death among other heart diseases. This is due to damage to heart muscle tissue, also known as myocardial injury. Aside from myocardial infarction, myocarditis is another primary cause of myocardial injury. One complication of myocardial injury is arrhythmia, or irregular heartbeat. The prevalence of arrhythmia is estimated to be around 1.5% to 5% of the global population. However, there is no research investigating the correlation between arrhythmia and myocardial injury, both in Indonesia and internationally. Therefore, it is crucial to conduct studies on the correlation between arrhythmia and myocardial injury using Cardiac Magnetic Resonance (CMR).

Materials and methods: This study employs a cross-sectional, non-paired categorical comparative analytical design. Data will be collected retrospectively, utilizing secondary data from the medical records of patients who underwent CMR and EKG examinations, to ensure relevant participants, a non-random purposive sampling technique will be used. The minimum sample size targeted for this investigation is 148.

Results: Among the study participants, 62 (59.6%) were diagnosed with arrhythmia and exhibited myocardial injury upon CMR examination. A significant association was established between arrhythmia and myocardial injury. This was supported by a p-value of 0.019 ($p<0.05$), an odds ratio of 2.696, and a confidence interval (CI) of 1.419-5.121.

Conclusion: This result of this study reveals a significant association between arrhythmia and myocardial injury.

Keyword: arrhythmia, myocardial injury, cardiac MRI

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RIGHT VENTRICULAR DYSFUNCTION IN HIGH BURDEN IDIOPATHIC INFERIOR AXIS PREMATURE VENTRICULAR CONTRACTION POPULATION

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Background and aims: The relationship between premature ventricular contractions (PVC) and right ventricular (RV) function is not widely known. Left ventricular dysfunction due to PVC is known as PVC-Induced cardiomyopathy (PIC) and suppressing the PVC substrate would improve left ventricular function. The effect of PVC ablation on changes in right ventricular (RV) function in patients with subtle subclinical RV dysfunction remains unknown. Understanding the alterations in RV function parameters after PVC ablation.

Materials and methods: Basic and speckle-tracking echocardiography has been performed on 42 individuals with symptomatic idiopathic inferior axis PVC before and one month after a successful ablation.

Result: The burden and QRS duration of premature ventricular contractions (PVC) were notably higher in the group with right ventricular (RV) dysfunction compared to those with normal RV function ($p = 0.012$ and $p = 0.009$, respectively).
In both groups, measurements of RV function before and after ablation, specifically global longitudinal strain (GLS) and free wall longitudinal strain (FWLS), demonstrated significant changes. These improvements were more pronounced in the group with RV dysfunction (FWLS 9.7 ± 4.0, $p < 0.001$; GLS 7.5 ± 4.2, $p < 0.001$). Lower initial FWLS and GLS before ablation emerged as significant parameters in the multivariate analysis for the improvement of RV function post-ablation.

Conclusion: Patients with RV dysfunction had higher PVC burden and wider QRS duration. Patients with idiopathic PVC and impaired RV function may experience improvements in RV function after successful PVC ablation.

Keywords: Premature Ventricular Contraction, Right Ventricular Dysfunction, Speckle Tracking, Radiofrequency Catheter Ablation

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CONDUCTION SYSTEM PACING LEARNING CURVE: LEFT BUNDLE VS CONVENTIONAL PACING

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Background and aims: Conduction system pacing (CSP) using left bundle branch area pacing (LBBAP) is a rapidly developing field that results in single-lead left ventricular resynchronization. Understanding the learning curve of LBBAP and comparing its procedural time with the conventional (apical and RVOT) pacing approach is an important consideration for new implanting centers.

Materials and methods: We compare 68 cases of LBBAP and conventional (apical and RVOT). The procedural duration and fluoroscopy time were used as surrogates for the learning curve of each technique.

Results: Patient characteristics were similar in LBBAP, Apical, and RVOT pacing; LV ejection fraction (66.1 ± 10.3, 66.89 ±4.88 and 65.16 ±4.84, p= 0.312), Risk Factor of Hypertension (50%, 63.2%, and 54.1%, p=0.707). The mean fluoroscopy duration for LBBAP was longer (0:20:45) compared to Apical (0:05:14) and RVOT (0:07:16, $p < 0.01$). Apical lead pacing has the lowest average procedure time compared to RVOT and LBBAP (62.7 ±10.5, 82.3 ±14.1 and 110.9 ± 26.9 minutes). Interestingly, the LBBAP procedure for the half-first procedure was significantly lower compared to the half-last (125.5±29.3 minutes vs 96.3 ± 20.1 minutes, $p<0.01$). Drop in procedural duration, plateauing, and remaining low at 90 minutes after the initial 6 cases.

Conclusion: Fluoroscopy duration was the most contributing factor to the longer LBBAP duration procedure compared to RVOT and Apical lead placement. However, our data also suggest that the CSP learning curve for LBBAP appears to plateaux after the first half of cases. Suggesting that LBBAP procedural duration can be improved with more experience and cases.

Keywords: CSP, LBBAP, Learning Curve, Pacemaker, Procedural Time.

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Risk Factors and Comorbidities Associated with The Incidence of Heart Failure in Atrial Fibrillation Patients: Singel Center Study From H. Hanafie Muaro Bungo

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Background and aims: Atrial Fibrillation (AF) and Heart Failure (HF) are major health issue that often co-exist and the combination would confer a greater mortality risk than either does alone. Although the causative relationship between AF and HF has not been fully determined, the co-existence may be explained by co-existing risk factors, including hypertension, diabetes, obesity, ischemic and non ischemic heart disease. The aim of study was to investigate general characteristic, risk factors, comorbidities AF patients and to determine the association between risk factors for AF patients who have heart failure and those who do not.

Materials and methods: A Retrospective study in patient with AF who came to cardiovascular outpatient clinic from November 2023 to January 2024. All of AF patient other than paroxysmal AF were included in this study. Patients were divided according to the presence of HF. Comparison of these groups was carried out using the chi-squared test (for categorical variables) and independent samples *t*-test (for continuous variables) to determine relationship between characteristics with HF in AF patients.

Results: A total of 104 patients were included in the study. Most patient were female (55.8%) with mean age was 56,52 ± 11,99 years and majority of symptom was dyspneu (61.5%). More than half of AF patient in this study have valvular heart disease (53,8%). Heart failure in AF patients was associated with adverse lifestyle (smoking) (p=0,022), hypertension (p=0,013), ischemic heart disease (p=<0.001), valvular heart disease (p=<0.001), and pulmonary disease (p=0,009).

Conclusion: In this study, risk factors and comorbidities including smoking, hypertension, ischemic heart disease, valvular heart disease, and pulmonary disease were the most significant risk factors and comorbidities for incident HF in Patients with AF.

Keyword: Atrial Fibrillation, Heart failure, Risk factors, Comorbidities

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The Association of Hypertension and Dyslipidemia with Cardiac Arrhythmia: An Analytical Study in Kebayoran Baru Public Health Center, Jakarta

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Background and Aims: Cardiac arrhythmia has a wide spectrum of heart rate and rhythm abnormalities and it can be present from asymptomatic to sudden cardiac arrest with various underlying diseases. Hypertension and dyslipidemia contribute to an increased risk of cardiovascular diseases and commonly coexist in cardiac arrhythmia patients. These clinical entities affect a worse clinical outcome. This study examines whether hypertension and dyslipidemia are significantly associated with cardiac arrhythmia and analyzes the characteristics of cardiac arrhythmia patients in Kebayoran Baru Public Health Center.

Materials and Methods: We perform an analytical observational study using a cross-sectional design. Data was taken from the medical records of Penyakit Tidak Menular (PTM) unit in Kebayoran Baru Public Health Center from January to December 2023. A total of 5673 patients were enrolled with 175 cardiac arrhythmia patients, including tachyarrhythmia and bradyarrhythmia. We analyzed using Chi-square test to study the correlativity of hypertension and dyslipidemia with cardiac arrhythmia. Then we explored the characteristics of these cardiac arrhythmia patients.

Results: Data presented that there were 175 (3%) cardiac arrhythmia patients and the majority were female (53.7%; n=94) and ≥60 y.o (37.1%; n=65). Our analysis found that 52% (n=91) of patients had obesity with a median of BMI 25.67 (17.03-38.57). We also found that 60.6% of cardiac arrhythmia patients (n=106) had hypertension, 29.7% (n=52) dyslipidemia, 14.3% (n=25) coronary artery disease, 6.9% (n=12) diabetes, and 2.9% (n=5) thyroid disease. A median of lipid profile level were total cholesterol 234mg/dl (100-396), triglyceride 145mg/dl (62-305), LDL 147mg/dl (71-219), HDL 40mg/dl (28-70). There was a significant association between cardiac arrhythmia and hypertension (OR 0.96; CI95% 0.70-1.30; p=0.029), but it didn't show a significant association between cardiac arrhythmia and dyslipidemia (OR 1.27; CI95% 0.86-1.67; p=0.092) or elderly age/≥60 y.o (OR 1.325; CI95% 0.97-1.80; p=0.088).

Conclusions: Hypertension is independently associated with cardiac arrhythmia as a risk factor or comorbid. The appropriate comprehensive management of hypertension is important to control cardiac arrhythmia incidents, including active screening in health centers.

Keywords: Cardiac arrhythmia, dyslipidemia, hypertension

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Left and Right Discrimination of Accessory Pathway Location Based on Earliest Delta Wave Occurrence on Precordial Leads

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Background and Aims: Localization of accessory pathway (AP) in Wolf Parkinson White (WPW) syndrome is crucial as it may affect the preparation needed for interventional procedure such as transseptal puncture. Even though various algorithms have been proposed for identifying the location of an accessory pathway, uncertainty remains regarding the predictive value of the delta wave shape, particularly in lead V1. Considering that lead V1 is positioned more to the right and serves as the most anterior lead, the appearance of a delta wave should occur earlier in V1 if an accessory pathway originates from the right side of the heart.

Materials and Methods: The aim of the study was to assess the discriminative ability of earliest delta wave occurence on precordial leads. It was a mixed cohort study of the patients with WPW syndrome who underwent electrophysiology study and conventional ablation in Adam Malik General Hospital Medan Indonesia since 2021 up to March 2024. Only the patients with manifest delta wave on precordial leads and with succesful ablation, which proof that it was the precised location of the AP, included in the study. The study assessed the appearance of the earliest delta wave on the ECG leads, with recording analysis at 200 mm/s, and validated by one blind examiner.

Results: In this study, 17 patients were included. Among them, 8 patients had right-sided accessory pathways (AP), while 9 patients had left-sided AP. Within the right-sided AP group, the earliest delta wave appeared in lead V1 for 7 patients. Conversely, in the left-sided AP group, 7 patients exhibited the earliest delta wave in non-V1 leads (V2-V6). The Fisher Exact test revealed a significant association between the location of AP and the precordial lead where the delta wave appeared earliest (p=0.015)

Conclusion: This study demonstrates that the precordial lead where the earliest delta wave appears can serve as a predictor for a left or right location of accessory pathways (AP) in Wolff-Parkinson-White (WPW) syndrome. However, for a more precise localization of AP, alternative algorithms must be utilized. Future studies can be conducted with better sample size.

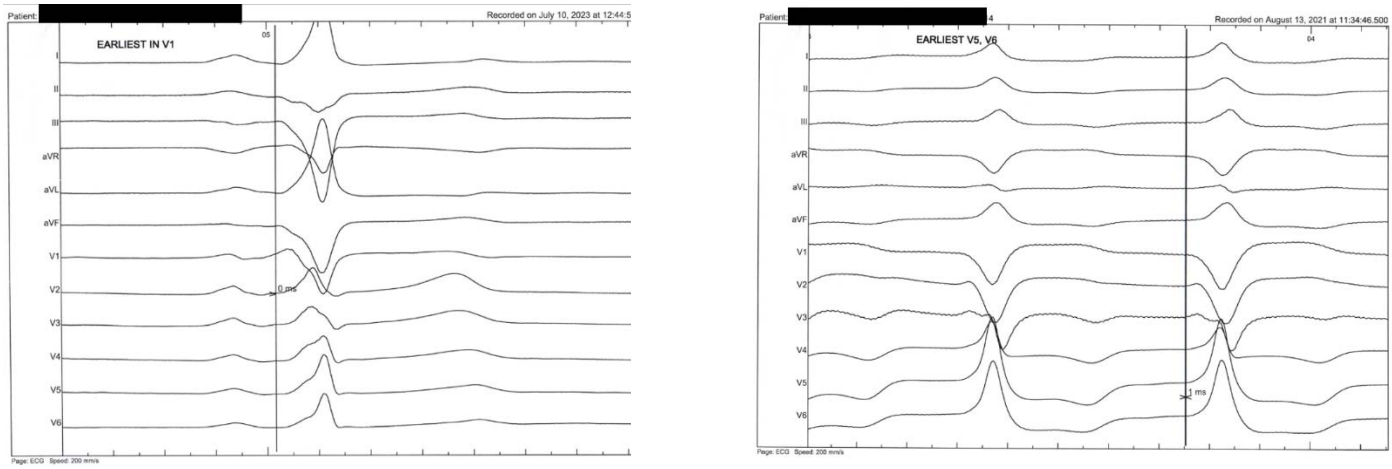

Figure 1. Delta wave occurence assesment with the speed of 200 ms

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Clinical and Echocardiographic Profile of Atrial Fibrillation Patients: Study from H.Hanfie Muaro Bungo Hospital Registry

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Background and aims: Atrial fibrillation (AF) is the most common arrhythmia encountered in daily clinical practice. AF can be caused by structural and or electrophysiological abnormalities that result in abnormal impulse generation. This study aimed to determine the clinical profile, risk factors, comorbidities and echocardiographic profiles in the AF registry of H. Hanafie Muaro Bungo Hospital.

Materials and Method: This was a descriptive study. We collected data from atrial fibrillation registry in H. Hanafie Muaro Bungo Hospital from November 2023 to January 2024. We exclude patient with incomplete data.

Results: Total of 76 AF patients were included in this study. Most populations in this study were female (51.3%) with mean age was 56.88 ± 11.32 years. The most common presenting complaint was dyspnea in (60.5%). Valvular hearts disease were found in (56.6%), others comorbidities were hypertension (38.2%), coronary artery disease (19,7%), diabetes mellitus (14.5%), pulmonary diseases (5.3%) and hyperthyroidism (2.6%). Based on echocardiography examinations 51.3% patients had preserved ejection fraction and 32.9% patients had reduce ejection fraction with right ventricle dysfunction were found in 38.2% patients. Most population have left atrial enlargement (90.8 %) and right atrium enlargement (51.3%). Thrombus was found in 6.6% patients. The most common valve abnormalities were mitral regurgitation (67.1%) followed by mitral stenosis (34.2%) patients.

Conclusion: In our study prevalence of AF was higher in the elderly and women with the most common presenting complaint was dyspnea. Valvular heart disease and hypertension were the most common comorbidities found. Understanding clinical, risk factors, comorbidities and echocardiographic can determine preventive strategies to reduce AF complications.

Keyword: Atrial fibrillation, clinical profile, comorbidities, echocardiography

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Electrocardiography on predicting left ventricular systolic dysfunction in heart failure patients.

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Background and Aims: Heart failure in Indonesia were rising up more than 4 million cases in the latest 5 years. Most healthcares in Sumatera Barat espescially in our region Pasaman Barat, still have no appropriate tools to diagnose heart failure. Left ventricular (LV) function is often asessed by ejection fraction (EF), where it can be examined by echocardiography. Unfortunately, echocardiography is not implemented in most healthcares in our region, while electrocardioraphy (ECG) is present more often. We aimed to study some ECG parameters in heart failure patients to evaluate whether they can predict LV systolic dysfunction (LVSD) as echocardiograpy did.
Material and Methods: This study was conducted at Pasaman Barat Hospital between January and December 2023. There were 255 patients admitted for heart failure but only 73 patients that have echocardiography recording, and finally we got 32 samples with LVSD based on the EF <50%, where it was our inclusion criteria in this study. We compare to the ECG that taken in the admission time. All patients were assessed by ECG measurements of P duration, QRS duration, QTc interval, Tend P/PQ*age, and Tend Q/PQ*age. The relationships between these ECG parameters were investigated. We also see the spesificity and sensitivity of these ECG parameters based on the latest systematic reviews. They were P duration >110ms, QRS duration >100ms, QTc interval ≥395ms, Tend P/PQ*age ≥0,033ms, and Tend Q/PQ*age ≥0.049ms.
Results: This study was cross-sesctional with analitycal statistic measured by spearman correlation. We got three ecg parameters which correlate with EF in LVSD group, they were QRS duration (P =0.049, r= -0.350), TendP/PQ*age (P=0.002, r=0.522), and TendQ/PQ*age (P=0.001, r=0.547). We found no single parameter good in both sensitivity and spescificity. QTc interval ≥395ms showed a high sensitivity but low specificity (96.9%; 31.7%; P=0.009).
Conclusion: Electrocardiographic features could be helping to predict LVSD. QTc interval ≥395ms was a sensitive feature in identifying LVSD.
Keywords: Electrocardiography, LVSD, Heart Failure.

1.	Baseline Characteristic	LVSD (n=32) mean±SD		
	Age	60±10		
	Heart rate	95±20		
	Ejection Fraction (%)	36±9		
	Male (n%)	20 (62.5)		
	Comorbidities (n%)			
	CAD	21 (65.6)		
	Pulmonary disorder	4 (12.5)		
	Kidney injury	2 (6.3)		
	DM	5 (15.6)		
2.	Basic information of ecg parameters	LVSD (n=32) mean±SD		
	P wave duration	109±22		
	QRS duration	96±20		
	QTc interval	441±30		
	TendP/PQ*age	0.016±0.01		
	TendQ/PQ*age	0.034±0.01		
	ST-T changes (n%)	29 (90.6)		
3.	ECG Parameters - EF correlation	P	Correlation coefficient	
	P wave duration	.991	-.002	
	QRS duration	.049	-.350	
	QTc interval	.856	-.033	
	TendP/PQ*age	.002	.522	
	TendQ/PQ*age	.001	.547	
4.	ECG parameter on LVSD	Sensitivity (%)	Specificity (%)	P
	P duration >110ms	37.5	58.5	0.736
	QRS duration >100ms	37.5	70.7	0.465
	QTc interval ≥395ms	96.9	31.7	0.002
	TendP/PQ*age ≥0,033ms	12.5	70.7	0.088
	TendQ/PQ*age ≥0,049ms	12.5	58.5	0.006

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Heartbeat Harmonies: Exploring Clinical Profile Electrophysiology Study of Patients with Probable Arrhythmia

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BACKGROUND AND AIMS: A diagnostic examination was developed to detect arrhythmias called the Electrophysiology Study (EPS). Even though the presence of EPS can help establish a diagnosis, Indonesia still has a challenge providing comprehensive arrhythmia management due to the uneven distribution of health facilities. Therefore, as one of the centres that can treat arrhythmias, we report the demographic data and clinical profile of patients undergoing EPS.

MATERIALS AND METHODS: Data collected retrospectively at Pasar Rebo General Regional Hospital showed that 126 patients underwent EPS from January 2022 to December 2023. All patient data, both demographic and clinical characteristics, was collected systematically. The data presentation will later be divided into three groups, namely groups that require medication, ablation, and the implantation of a permanent pacemaker (PPM).

RESULTS: There are more female patients than male (57,1% vs 42,9%), with an age range of 15 – 77 years (median 53 years). Patients in the group requiring PPM implantation were older than the others (median 68 years). Palpitations are the most common complaint felt by patients undergoing EPS (73%). Hypertension was the most common comorbid disease (31%). The EPS results found that 97 patients (77%) had abnormalities, and 66 (52.4%) required further action. Premature Ventricular Complex (PVC) was the most common abnormality (19%) followed by Atrial Fibrillation or Aflutter (16,7%). The ejection fraction (EF) range was 34% - 88% (66% ± 1,035). The average results of each laboratory parameter look normal overall, but patients requiring PPM implantation had a worse renal profile.

CONCLUSION: PVC and Atrial Fibrillation or Flutter are the most common arrhythmias found in our centre based on EPS results. The EF and renal profile of patients requiring PPM implantation were worse than the other groups. The results can be used as a reason that screening for arrhythmias is important in our region.

Keywords: Electrophysiology Study, Arrhythmia, Ablation, Permanent Pacemaker

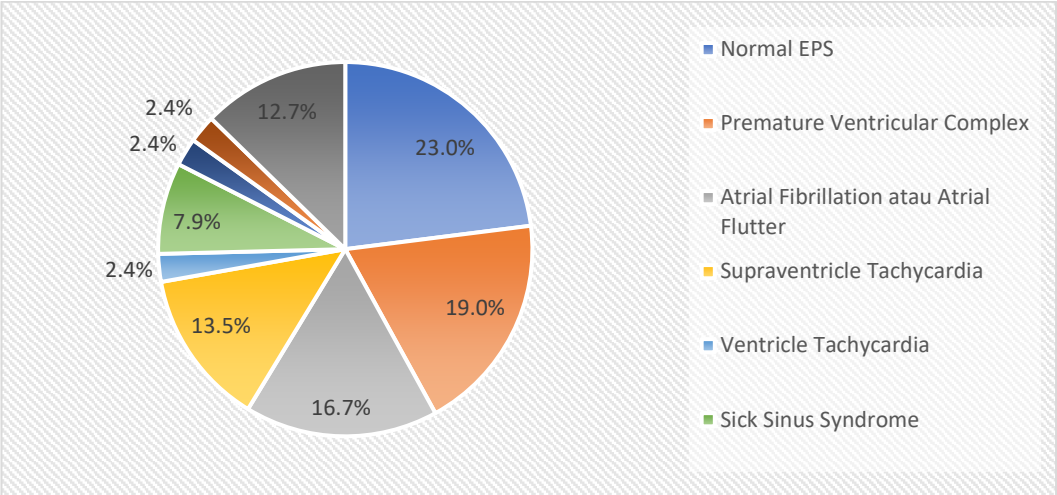

Figure 1. The pie chart has the percentage of EPS results

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Clinical Profile of Patients Undergoing Catheter Ablation Procedures: A Retrospective Analysis

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Background and Aims: Catheter ablation is the primary treatment for arrhythmia cases when antiarrhythmic medications are ineffective. The patients undergoing this treatment exhibit a diverse profile, ranging from asymptomatic patients to those with cardiovascular diseases. This study aims to determine the clinical profile and analysis factors influencing the success of catheter ablation procedures

Materials and Methods: A one-year cross-sectional study reviewed the medical records of patients who underwent catheter ablation at Dr. Ramelan Navy Hospital, Surabaya. Inclusion criteria included patients who underwent catheter ablation between 2023 and 2024. Exclusion criteria comprised patients who underwent only an electrophysiology (EP) study or had incomplete data.

Results: During 2023 to mid-2024, a total of 59 patients underwent catheter ablation. The majority of patients were female (59.3%) and in the age group <40 years (39.0%). Six types of arrhythmias were diagnosed in this study population, including WPW/AVRT, AVNRT, AT, and AFib (classified as supraventricular arrhythmias), as well as PVC and VT (classified as ventricular arrhythmias). The highest prevalence was observed for PVC (44.1%) among ventricular arrhythmias and AVNRT (25.4%) among supraventricular arrhythmias. Hypertension was the most prevalent comorbidity (35.6%), with palpitations being a frequent symptom (93.2%). Amiodarone was the most commonly used antiarrhythmic drug (71.2%). The overall success rate of catheter ablation was high in this study population (79.7%). Supraventricular arrhythmias had a higher success rate (90,0% vs 69,0%) and lower failure rate (10,0% vs 31,0%) compared to ventricular arrhythmias, with an odds ratio of 4.05 (95% CI: 0.97 – 16.90) and significance value (p = 0.045).

Conclusion: The success rate of catheter ablation is higher in patients with supraventricular arrhythmias compared to those with ventricular arrhythmias. However, the success of this procedure can vary depending on the specific type of arrhythmia the patient presents with.

Keyword : Supraventricular arrhythmia, Ventricular arrhytmia, Catheter ablation, Antiarrhytmic medication

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Predictive Factors for Successful Ablation in Premature Ventricular Contraction Patients: A Retrospective Analysis

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Background and Aims: Premature ventricular contractions (PVCs), a type of irregular heartbeat originating in the ventricles of the heart, are a common occurrence. While often benign, frequent PVCs can be bothersome and, in some cases, even dangerous. This retrospective analysis aims to identify the secret thing for successful PVC ablation. By looking back at the medical records of past patients, we hope to uncover factors that might predict a more favorable outcome.

Materials and Methods: A one-year cross-sectional study reviewed medical records of patients undergoing PVC ablation at Dr. Ramelan Navy Hospital, Surabaya. Demographic data, comorbidities, symptoms, pre-procedural medication use, and procedural outcomes were analyzed.

Results: Most patients were male with higher education. Hypertension was prevalent (38.1%), and palpitations were a frequent symptom (85.7 %). Amiodarone was the most commonly used anti-arrhythmic drug (71.4%). Reappeared ablation procedure significantly correlated with successful treatment (p-value = 0.015). No significant correlations were found between successful ablation with : (i) PVC status (single status, p-value = 0.3), (ii) Holter findings (success rate 15.25%, p-value = 0.49), and (iii) PVC origin (anteroseptal origin 75% success, p-value = 0.89).

Conclusion: Not all patients with problematic PVCs respond equally well to catheter ablation. Interestingly, the reappearing ablation procedure of PVCs emerged as a significant predictor of successful ablation. While traditional factors like PVC burden and origin did not hold sway, further research is warranted to explore the underlying mechanisms of this association.

Keyword : Premature Ventricular Contraction (PVC), Catheter ablation, Holter finding

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Characteristic of Patients with Permanent Pacemaker in Pasar Rebo Regional General Hospital period April 2022 – May 2024

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Background and aims: Permanent pacemaker are small electronic medical device are implanted to generate electrical impulses and regulate the heart. Permanent pacemaker implantation is a relatively and minimally safe procedure with low complication in patients with symptomatic bradyarrythmias. This study was conducted to determined the characteristic of patients with permanent pacemaker in Pasar Rebo Regional General Hospital period April 2022 – May 2024.

Materials and methods: Cross-sectional descriptive study was conducted in Pasar Rebo Regional General Hospital between May 27th and June 13th 2024. Data were taken from medical record of those patients with pacemaker within the period of April 2022 to May 2024. All patients were included in this study (total sampling). Data was analyzed by using univariate analysis.

Results: This study included 56 patients with mean age of 66.95 ± 12.97 years and 30 (53.6%) were males. The most common indication for permanent pacemaker implantition was total atrioventricular (AV) block in 23 cases (41.1%). Single chamber VVI (19 patients, 33.9%) and VVIR (19 patients, 33.9%) pacing mode were found to be the most common pacing mode used for permanent pacemaker implantation. There are comorbidities present at diagnosis, 15 (26.8%) had coronary artery disease, 26 (46.4%) chronic heart failure, 24 (42.9)% hypertention and 3 (5,4%) diabetes mellitus.

Conclusion: Based on the analyzed data, the result showed patients with permanent pacemaker mostly male. Total AV block was the most common indication for permanent pacemaker implantation and single chamber (VVI and VVIR) is commonly used.

Keywords: Bradyarrythmia, Total AV block, Permanent pacemaker, Single chamber, VVI, VVIR

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First Steps of A Burgeoning Cathlab: A 6-Year Milestone of Premature Ventricular Complex Electrophysiological Study and Ablation

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Background and Aims: Premature ventricular complex (PVC) is a routinely encountered cardiac arrhythmia where a burden of >10% can lead to cardiomyopathy and heart failure. Studies have demonstrated that catheter ablation is more effective than pharmacotherapy for eliminating PVCs. There is a lack of study that examines the broad demographic picture of EP Study (EPS) & Ablation on PVCs in Indonesia. Therefore this study aim to assess the overall characteristics, success, and complication rate of EPS & ablation on PVCs in our Healthcare center in Surabaya, Indonesia from its very first attempt.

Materials and Methods: This Retrospective study uses cross sectional approach. The subjects of this study are PVC patients, whose inclusion criteria were diagnosed with PVC through ECG and/or Holter monitoring and underwent EPS and/or ablation in Dr. Soetomo Regional General Hospital from December 2018 to April 2024, with samples obtained through total sampling.

Results: There were 95 patients with PVC, mostly female (57.9%) that went through EPS and/or ablation. Main complaint being palpitation (87.4%), and almost half have no comorbidities (49.5%). The procedures netted a success rate of 58.9%. 7 (7.37%) patients underwent EPS only procedure, with the main excuse being the ablation procedure required a catheter upgrade. Bigeminy is the most prevalent pattern (61%) with 56.9% success rate. The typical origin of PVC is RVOT (55.8%) with 73.6% success rate. The morphology is primarily unifocal (87.4%) with 56.6% success rate. Most patients have frequent PVC (81%) with 58.4% success rate. Overall complication rate is miniscule (2.11%), highest being Cardiac tamponade.

Conclusion: In our study, patients with palpitation without comorbidities is the most common denominator. Moreover, unifocal & RVOT is the most common types of PVC. Despite the low complication rate, the learning curve of the procedures affected the general success rate. With further experience, improvements in success rate will be possible in future procedures in this center.

Keywords: Premature Ventricular Complex, EP study, ablation, success rate, complication