



**Indonesian Journal of  
Cardiology**

Indonesian J Cardiol 2022;43:suppl\_D  
pISSN: 2830-3105 / eISSN: 2964-7304  
doi: 10.30701/ijc.1426



# The 9<sup>th</sup> Annual Scientific Meeting InaHRS 2022

**Abstract: Research**



RESEARCH ARTICLE



### **Comorbidities of Atrial Fibrillation in Indonesia**

A. I. Supit<sup>1</sup>, Y. Yuniadi<sup>1</sup>, D. A. Hanafy<sup>1</sup>, S. B. Raharjo<sup>1</sup>, D. Y. Hermanto<sup>1</sup>

<sup>1</sup>National Cardiovascular Center Harapan Kita, Jakarta, Indonesia

**Background and aims:** Atrial fibrillation (AF) is the most common form of cardiac arrhythmia resulting from structural and/or electrophysiological abnormalities with abnormal impulse formation. The risk of AF progression is associated with demographic factors, lifestyle factors, cardiovascular conditions, and comorbidities. Therefore, this study was conducted to determine the prevalence of AF and its comorbidities in Indonesia

**Materials and Methods:** This study was a multicenter collaborative study using an observational cross-sectional design from 2018 to 2019 in tertiary care population in Indonesia. Variables collected were age, gender, and comorbidities such as heart failure, hypertension, diabetes, stroke, coronary heart disease, peripheral arterial disease, and previous history of atrial fibrillation. An electrophysiologist in each centre professionally evaluated the interpretation of the electrocardiography (ECG) data. All data were analyzed descriptively with frequency and percentage using SPSS v21.

**Results:** There were a total of 9,773 subjects included in this study. Mean age was 44.40±14.80 years with a gender distribution of 45.5% men and 54.5% women. The prevalence of AF was 3.5%. Atrial fibrillation was found in 7.4% subjects older than 65, in 14.2% of those with heart failure, 5% of those with hypertension, 7.3% of those with diabetes, 13.9% of those with stroke, 6.6% of those with coronary artery disease, and 10% of those with peripheral arterial disease.

**Conclusion:** Around seven out of two hundred people (3.5%) in Indonesia suffer from AF. AF was more common among subgroups older than 65 years, male gender, history of heart failure, hypertension, diabetes, stroke, coronary artery disease, stroke and peripheral artery disease.

**Keywords:** Atrial fibrillation, Prevalence, Risk factors, Comorbidities, Indonesia



## The Presence of Atrial Fibrillation during Acute Decompensated Heart Failure Admission and Its Independent Risk Factors for In-Hospital Mortality

A.H. Alamsyah<sup>1</sup>, P.T.P. Pinatih<sup>1</sup>, A.Z. Alamsyah<sup>1</sup>, I M.P.S. Antara<sup>2</sup>

<sup>1</sup> Faculty of Medicine, Udayana University, Bali, Indonesia

<sup>2</sup> Department of Cardiology and Vascular Medicine, Faculty of Medicine Udayana University, Prof. Dr. I.G.N.G. Ngoerah General Hospital, Bali Indonesia

**Background and aims:** Atrial fibrillation (AF) is a common arrhythmia in patients with acute decompensated heart failure (ADHF). Although many previous studies have described that the presence of AF significantly increases mortality in ADHF, only a few studies described factors associated with mortality in patients admitted with AF and ADHF. This study aims to determine the independent risk factors for in-hospital mortality in patients admitted with AF and ADHF.

**Materials and methods:** This is a single-center, observational, cross-sectional study. All hospitalization with AF and ADHF were included from January 2021 to May 2022. The demographic, clinical, laboratory, echocardiography, and mortality data were extracted. In the bivariate analysis, Pearson's chi-square was used for categorical data, and the t-test or Mann-Whitney's U test was used for numerical data. The logistic regression model was used for multivariate analysis. The significant numerical data were further analyzed using the receiver operating characteristic (ROC) curve. Statistical significance is defined as a *p*-value <0.05.

**Results:** 289 ADHF hospitalizations were included with a mean age of 60.48 years old and 51.9% were male. AF was presented in 106 (36.7%) hospitalizations. On multivariate analysis of clinical-laboratory findings, we found that in-hospital mortality in AF and ADHF was associated with Profile C ADHF (OR: 3.81; 95%CI: 1.13–12.88; *p* =0.03), CHA2DS2VAS Score (OR: 2.04; 95%CI: 1.26–3.31; *p* =0.004), and Acidosis (OR: 5.65; 95%CI: 1.69–18.95; *p* =0.005). Meanwhile, on multivariate analysis of echocardiography findings, we found that in-hospital mortality in AF and ADHF was associated with moderate-to-severe mitral stenosis (OR: 5.61; 95%CI: 1.41–22.14; *p* =0.014). ROC curve analysis of the CHA2DS2VAS score found that a score of 3.5 or higher was associated with a higher risk of in-hospital mortality in AF and ADHF (AUC: 0.641; Sensitivity 61%; Specificity 67%).

**Conclusion:** AF with ADHF at admission was associated with a significantly increased risk of in-hospital mortality compared to AF or ADHF alone. The presence of Profile C ADHF, 3.5 or higher CHA2DS2VAS score, acidosis, and moderate-to-severe mitral stenosis was associated with an increased risk of in-hospital mortality in AF and ADHF hospitalizations.

**Keywords:** Atrial fibrillation, Acute decompensated heart failure, In-hospital mortality

**Table 1.** Multivariate analysis of risk factors associated with in-hospital mortality in ADHF patients with AF

Associated risk factors	Parameters	B	<i>p</i> -value	OR	95% CI
Clinical and laboratory risk factors	Profile C	1.34	0.03	3.81	1.13 – 12.88
	CHA2DS2VAS Score	0.715	0.004	2.04	1.26 – 3.31
	Acidosis	1.732	0.005	5.65	1.69 – 18.95
Echocardiography risk factor	Mitral stenosis	1.58	0.014	5.61	1.41 – 22.14



## Finding The Dot Between Age and Patient's Comorbidities with Cardiac Implanted Electronic Devices Infection: An Insight from Sardjito Hospital Arrhythmia Registry

A. Muthmaina<sup>1</sup>, F. Hidayati<sup>1</sup>, H. Mumpuni<sup>1</sup>, E. Maharani<sup>1</sup>

<sup>1</sup>Departement Cardiology and Vascular Medicine Gadjah Mada University/Sardjito General Hospital,  
Yogyakarta, Indonesia

**Background and aims:** Cardiac implantable electronic device (CIED) is an important therapy in the cardiovascular field. CIED implantation increased by 98% in 15 years. This increase was accompanied by an increase in CIED infection. In those 15 years, there was a 210% increase in infections, with an incidence of 1.6% in America. Prior study showed that younger age, and patient's comorbidities such as heart failure (HF), diabetes mellitus (DM) and renal insufficiency (eGFR <60 ml/min/1.73 m<sup>2</sup>) were associated with increased risk of CIED infection. The aim of this study is to see the correlation between Age and patient's comorbidities with CIED infection in patient that underwent implantation from January 2017 to May 2021 in Sardjito Hospital.

**Materials and methods:** Observational study with retrospective cohort method with research subjects 423 patients who underwent CIED implantation at Sardjito Hospital from January 2017 to May 2021 and fulfilled the inclusion and exclusion criteria. Data was taken from Sardjito Hospital Arrhythmia Registry, and follow-up was done to evaluate infection within 12 months after implantation.

**Results:** A total of 423 patients (197 males and 226 females) were included in this study with median age was 67 (22-95) y.o. CIED infection was observed in 10 (2.3%) patients. Comorbidities of HF was observed in 106 patients (2 with CIED infection), DM in 90 patients (3 with infection), and renal insufficiency in 128 patients (1 with CIED infection). Statistical analysis yields significant correlation between younger age and CIED infection ( $p = 0.005$ ) with OR 0.946 (0.919-0.986), and no significant correlation between HF, DM and renal insufficiency with CIED infection, with OR 1.346 (0.281-6.441); 0.623 (0.58-2.458); and 3.997 (0.501-31.879) respectively.

**Conclusion:** There was a significant correlation between younger age and CIED infection, but no significant correlation was found in HF, DM and renal insufficiency with CIED infection. We found an increased infection risk among patients with HF and renal insufficiency. This result consistent from the prior study, but further research may be needed.

**Keywords:** CIED infection, age, heart failure, diabetes mellitus, renal insufficiency

Table 1. Baseline characteristic and bivariate analysis

	Infection (n=10)	No Infection (n=413)	P value
Age (years), median (min-max)	55.4 (28.9-75.9)	69.1 (22.2-95.0)	0.005*
Gender, n (%)			
Male	6 (60)	191 (46.2)	0.525
Heart failure, n (%)	2 (20)	104 (25.2)	1.000
Diabetes mellitus, n (%)	3 (30)	87 (21.1)	0.449
Renal insufficiency, n (%)	1 (10)	127 (30.7)	0.294



## LEFT ATRIAL STRUCTURE OF ATRIAL FIBRILLATION PATIENTS IN SANGLAH GENERAL HOSPITAL

A.Setiawan<sup>1</sup>, I.M.P.S.Antara<sup>2</sup>, I.D.G.S.M.Badung<sup>3</sup>  
<sup>1,3</sup> Cardiology resident Sanglah General Hospital Bali  
<sup>2</sup> Cardiologist Sanglah General Hospital Bali

**Background and aims:** Atrial Fibrillation (AF) is the most common cardiac arrhythmia in adults. AF is associated with an elevated risk of stroke and death. Atrial remodeling, defined as any change in atrial structure or function that promotes atrial arrhythmias, can cause AF. Remodeling can be due to underlying cardiac conditions, systemic processes, or AF itself. Based on temporal pattern, AF is classified into paroxysmal and non-paroxysmal AF (long standing persistent, persistent and permanent). Progression from paroxysmal to non-paroxysmal AF is often characterized by advancing atrial structural remodelling. AF increases the risk of stroke five-fold. Current guidelines recommend using CHA<sub>2</sub>DS<sub>2</sub>-VASc score for stroke risk stratification. We aim to know the relationship between left atrial structure, temporal pattern and risk of stroke in AF patients.

**Materials and methods:** Data was extracted from Sanglah General Hospital's medical record. All atrial fibrillation patients, receiving warfarin, and visit outpatient clinic in Sanglah General Hospital were included in this study. Left atrial and ventricle structure were compared across AF types and CHA<sub>2</sub>DS<sub>2</sub>-VASc scores as an estimate of stroke risk. Kruskal-Wallis test and Mann-Whitney post hoc test was used in this study.

**Results:** Left atrial and ventricle structure was assessed by transthoracic echocardiography in 77 participants (mean age 54 ± 14.3 years, 50.6% women). Of all participants, 49.4% were in paroxysmal AF, 19.5% in persistent AF and 35.1% in long standing persistent. Left atrial volume index (LAVI), left atrial diameter and left ventricular mass index (LVMI) showed differences across AF types and CHA<sub>2</sub>DS<sub>2</sub>-VASc score (P<0,001). With an increasing duration of AF and higher CHA<sub>2</sub>DS<sub>2</sub>-VASc scores, LAVI, LA Diameter and LVMI increased. Post Hoc analysis showed significant differences in paroxysmal AF versus long standing persistent AF and low (≤2) CHA<sub>2</sub>DS<sub>2</sub>-VASc score versus high (4-6) CHA<sub>2</sub>DS<sub>2</sub>-VASc score.

**Conclusion:** LA structures were increasingly abnormal throughout the course of the AF and higher stroke risk estimated by CHA<sub>2</sub>DS<sub>2</sub>-VASc score. Early detection and treatment of AF is very important.

**Keywords:** Atrial fibrillation, Left atrium, Stroke, Echocardiography



**Revisiting An Under looked Parameter: T-wave Alternans in Coronary Artery Disease**

A.P. Rahman<sup>1</sup>, E. Maharani<sup>2</sup>, F. Hidayati<sup>2</sup>, I.A. Arso<sup>2</sup>

<sup>1</sup> Faculty of Medicine, Cardiology Department Resident, Gadjah Mada University, Yogyakarta, Indonesia

<sup>2</sup> Faculty of Medicine, Cardiology Department Staff, Gadjah Mada University, Yogyakarta, Indonesia

**Background and aims:** T-wave alternans (TWA) is a beat-to-beat alternation of the amplitude and/or shape of the T-wave, which predicts arrhythmic risk in patients with coronary artery disease (CAD). The TWA values were higher in CAD subjects compared with healthy individuals. This study aims to compare the TWA value between subsets of CAD subjects based on the burden of their CAD.

**Materials and methods:** We enrolled 124 CAD subjects in a case-control study, referred for exercise stress test (EST). T-wave alternans was assessed by the modified moving average (MMA) method. A TWA value of  $<47 \mu\text{V}$  was considered as normal, while the TWA value of  $\geq 47 \mu\text{V}$  was considered as abnormal. Subjects were divided into two groups which consists of 62 subjects with abnormal TWA value, and 62 subjects with normal TWA value. The subjects CAD burden based on the vessel disease (VD) was reviewed, further categorized into single-VD or multi-VD.

**Results:** There were 44 (35.5%) subjects with abnormal TWA value had multi-VD, only 18 (14.5%) subjects with abnormal TWA value had single-VD, 35 (28.2%) subjects with normal TWA value had multi-VD, the other 27 (21.8%) subjects with normal TWA value had single-VD, that showed an Odds Ratio of 1.886 ( $P=0.093$ , CI 95% 0.897-3.966).

**Conclusion:** Even though it was statistically not significant, the prevalence of CAD subjects with multi-VD was higher in abnormal TWA value group compared to the normal TWA value group.

**Keywords:** T-wave alternans, coronary artery disease, single vessel disease, multi vessel disease.



**RISK FACTORS OF PERIOPERATIVE ATRIAL FIBRILLATION IN POST CORONARY ARTERY BYPASS GRAFTING SURGERY PATIENTS**

B. Radeza<sup>1</sup>, P. Ardhianto<sup>2</sup>, S. B. Utami<sup>2</sup>

<sup>1</sup>*Undergraduate Program, Faculty of Medicine, Universitas Diponegoro, Semarang, Indonesia*

<sup>2</sup>*Department of Cardiovascular and Vascular Medicine, Faculty of Medicine, Universitas Diponegoro, Semarang, Indonesia*

**Background and aims:** Perioperative atrial fibrillation (POAF) is the most common supraventricular arrhythmia occurring in the perioperative period of cardiac surgery. The risk factors for POAF are still unclear and have not been studied further in Indonesia. Therefore, this study was carried out to analyze several risk factors for the prevalence of new-onset POAF after Coronary Artery Bypass Grafting (CABG) surgery.

**Materials and methods:** This study is an analytic observational retrospective study with a case control design, at RSUP Dr. Kariadi Semarang. Samples are new-onset POAF patients and non-POAF patients after CABG surgery. The data taken were age, gender, weight, height, LVEF and creatinine before surgery, history of Diabetes Mellitus, history of COPD, duration of aortic cross clamp (AoX), and duration of cardiopulmonary bypass (CPB), obtained from the patients medical records. Categorical data was processed using the chi square test. Numerical data were processed using the unpaired T test.

**Results:** The samples obtained were 50 POAF patients and 50 non-POAF patients (n=100). There was a significant difference in gender between POAF and non-POAF patients,  $p=0.37$  (OR 3.92; 95% CI, 1.01-15.22). Male patients were more likely to have POAF than women. There was a significant mean difference in duration of the aortic cross clamp between POAF and non-POAF patients,  $p = 0.00$  (95% CI, 3.31-11.25). POAF patients had a longer mean of AoX duration than non-POAF patients. There was a significant mean difference in duration of cardiopulmonary bypass between POAF and non-POAF patients,  $p=0.00$  (95% CI, 1.07-1.23). POAF patients had a longer mean of CPB duration than non-POAF patients. There was no significant relationship between POAF and other variables.

**Conclusion:** Male patients, with a longer duration of aortic cross clamp and cardiopulmonary bypass, have an increased risk of new-onset POAF.

**Keywords:** Perioperative Atrial Fibrillation, Coronary Artery Bypass Grafting



## Accuracy of Self Pulse Palpation (MENARI) For Detecting Atrial Fibrillation in Indonesian's High Risk Population

A. Rizal<sup>1,2</sup>, C. Kahadi<sup>1,2</sup>, M. R. Fadlan<sup>1</sup>

<sup>1</sup>Departement of Cardiology and Vascular Medicine, Faculty of Medicine, Brawijaya University-dr.Saiful Anwar General Hospital, Malang East Java, Indonesia

<sup>2</sup>Brawijaya Cardiovascular Research Center, Brawijaya University

**Background and aims:** Early detection of atrial fibrillation (AF) is important because AF is often asymptomatic and its first manifestation may be a disabling stroke. MENARI (Self Pulses Assesment) is national program to detect atrial fibrillation, but as far as we know, there was no study in Indonesia to measure its accuracy. The aims of this study to examined accuracy of MENARI to detect atrial fibrillation

**Materials and methods:** We collected from total of 1385 subject's with high risk population according CHA2DS2-VASc Score  $\geq 2$ , age > 50 years attending 8 primary care centers (PCCs) in Malang were invited to take part in AF screening from July 2021 to December 2021. All participants were individually interviewed with a structured questionnaire for collecting baseline characteristic. Each participant underwent 2 methods of screening: a 60-second radial pulse-check; 12-lead electrocardiogram (AF diagnosed by cardiologist). Subjects unable to find the pulse were excluded (7,9%). We compared self pulse palpation with ECG for it's accuracy for detecting atrial fibrillation.

**Results:** The mean age of this subjects were  $61,5 \pm 6,9$  Yo. We found 11,3% patient's with AF with Number Needed to Screen was 76 and 74,4% subject's were female. We found that participant's were unable to find their pulse had significant lower MMSE score than participant's were able to find their pulse ( $27,68 \pm 0,25$  vs  $28,45 \pm 0,48$  respectively,  $p < 0,000$ ). Sensitivity of MENARI was 67,9% (95% confidence interval [CI], 64%-72%). It's specificity was 68.3% (95% CI, 66%-72%). The positive likelihood ratio was 2.16, while the negative likelihood ratio was 0,47.

**Conclusion:** In this study, we suggest that pulse palpation has relatively lower sensitivity and specificity for detecting atrial fibrillation. We need added some clinical scoring to increase their accuracy.

**Keywords:** atrial fibrillation, MENARI, pulse palpation



**THE SAFETY AND EFFICACY PROFILE OF SHORT COURSE PROPHYLACTIC INTRAVENOUS ANTIBIOTIC  
FOLLOWING CARDIAC IMPLANTABLE ELECTRONIC DEVICES (CIED) IMPLANTATION**

F. Hidayati<sup>1</sup>, E. Maharani<sup>1</sup>

<sup>1</sup>Department of Cardiology and Vascular Medicine, Faculty of Medicine, Public Health and Nursing, Universitas Gadjah Mada, Indonesia/ Sardjito Hospital Yogyakarta Indonesia

**Backgrounds and Aims:** Intravenous (IV) antibiotic before and few days after cardiac implantable electronic device (CIED) implantation are generally administered in our hospital resulting long hospital stay. This study aims to investigate the effects of shorter duration of IV antibiotic after CIED implantation.

**Materials and Methods:** An observational retrospective study was conducted using CIED registry in Sardjito General Hospital, Yogyakarta, Indonesia, between Jan 2017 to Aug 2021. Adults with CIED implantation who fulfilled the inclusion and exclusion criteria were recruited. All subjects received 1.5-gram Ampicillin-Sulbactam IV before the procedure. There were two groups of subjects: Group 1 obtained IV Ampicillin-Sulbactam bid  $\geq$  four - six times and Group 2 received IV Ampicillin-Sulbactam bid two times after the implantation. Follow up of CIED infection was done minimal 6 months after implantation.

**Results:** A total of 453 patients were included in this study, 153 and 300 in group 1 and 2, respectively. The mean age was  $65.8 \pm 13.2$  yo and  $67.1 \pm 13.1$  yo in group 1 and 2. Permanent pacemaker (PPM) was the most common CIED type implanted in both groups (97.3% and 98%). The atrioventricular node dysfunction was the most frequent indication for PPM procedure (58.6% and 61.4%). The rate of CIED-related infections was 4,6% (7) and 1.0% (3) in group 1 and 2, respectively ( $p=0.02$ ). The median length of stay (LOS) in group 1 and 2 were 7 and 4 days, respectively ( $p=0.000$ ).

**Conclusion:** The CIED-related infection and LOS were shown to be significantly lower in the group with shorter duration of antibiotic administration.

**Keywords :** CIED infection, Prophylactic antibiotics, Length of stay



**Decisive Factor of Early Reversibility in High Degree AV Block Complicating Inferior ST-Elevation Myocardial Infarction after Percutaneous Coronary Intervention**

*H. Herman<sup>1</sup>, E. Maharani<sup>2</sup>, F. Hidayati<sup>2</sup>, B. Y. Setianto<sup>2</sup>*

<sup>1</sup>Faculty of Medicine, Public Health, and Nursing, Universitas Gadjah Mada, Yogyakarta, Indonesia.

<sup>2</sup> Faculty of Medicine, Public Health, and Nursing, Universitas Gadjah Mada, Yogyakarta, Indonesia / Rumah Sakit Umum Pusat Dr. Sardjito, Yogyakarta, Indonesia

**Background and aims:** High-degree atrioventricular block (HDAVB), 2<sup>nd</sup>-degree type II AV block, 2:1 AV block, or total AV block, is one of the most common complications of the inferior ST-elevation myocardial infarction (STEMI) and may contribute to morbidity and mortality. Theoretically, several factors contributed to the reversibility of atrioventricular block in ischemia including the patient's characteristics, comorbidity, hemodynamic, coronary flow and ischemic time. A previous study showed around 70% reversibility of HDAVB occurred in the first 24 hours after revascularization. This study aims to describe factors that are related to the early reversibility of HDAVB in Inferior STEMI patients after percutaneous coronary intervention (PCI) in RSUP Dr. Sardjito.

**Materials and methods:** Analytical observations were conducted with a cross-sectional design, consecutive sampling using secondary data from medical records in RSUP Dr. Sardjito within August 2018-August 2021 on inferior STEMI with HDAVB population underwent PCI, then we obtained baseline characteristic, electrocardiogram, and coronary angiography.

**Results:** During the study period 710 patients had inferior STEMI, and 192 patients (27.04%) had HDAVB. There were 129 patients were included in this study, and 92 patients (71.32%) had early reversibility ( $\leq 24$  hours after PCI), with mean age  $61.15 \pm 11.44$ , 81.5% patients is male, 57.6% had hypertension ( $p = 0.182$ ), 45.7% had Diabetes Mellitus ( $p = 0.758$ ), 64.1% was smoker ( $p = 0.335$ ), 3.3% had previous acute coronary syndrome ( $p = 0.676$ ), median of systolic blood pressure (BP) 111(70-180) mmHg, mean of diastolic BP  $65 \pm 10.12$  mmHg ( $p = 0.946$ ;  $0.983$ ), 7.6% had Killip IV ( $p = 0.295$ ), 51.3% Mosseri type III lesion ( $p = 0.677$ ), thrombolysis in myocardial infarction (TIMI) flow 3 in 70.7% patients ( $p = 0.792$ ), and median ischemic time of early reversibility HDAVB was 632.5 (165-7380) minutes while the group with  $> 24$  hours reversibility was 1505 (505-7444) minutes ( $p = 0.000$ ).

**Conclusion:** Short total ischemic time is considered a significant factor contributing to early reversibility of HDAVB in inferior STEMI in RSUP Dr. Sardjito

**Keywords:** early reversibility, HDAVB, inferior STEMI, PCI, total ischemic time

Characteristic	Reversibility of HDAVB		P value
	$\leq 24$ h n=92	$> 24$ h n=37	
Age, years	62.15±11.44	61.03±10.82	0.609
Sex, male	75 (81.5)	28 (75.7)	0.454
Risk Factors			
Hypertension	53 (57.6)	26 (70.3)	0.182
Diabetes Mellitus	42 (45.7)	18 (48.6)	0.758
Smoker	59 (64.1)	27 (73)	0.335
Previous ACS	3 (3.3)	1 (2.7)	0.676
Blood Pressure after PCI			
Systolic, mmHg	111 (70-180)	111 (72-170)	0.946
Diastolic, mmHg	65 + 10.12	66 (40-89)	0.983
Killip Class			0.295
I	77 (83.7)	29 (78.4)	
II	5 (4.3)	2 (5.4)	
III	4 (4.3)	0 (0)	
IV	7 (7.6)	6 (16.2)	
Lesion Type			0.677
Mosseri type III	46 (50)	20 (54.1)	
Mosseri type IV	46 (50)	17 (45.9)	
TIMI flow			0.792
3	65 (70.7)	27 (73)	
Total ischemic time, minutes	632.5 (165-7380)	1505 (505-7444)	0.000*

\*significant value  $< 0.05$



### Predictor of Change in Left Ventricular Ejection Fraction after Cardiac Resynchronization Therapy

E.J. Gunawan<sup>1</sup>, Johan<sup>1</sup>, Robert<sup>2</sup>, I. Citra<sup>2</sup>, D.L. Munawar<sup>1</sup>, B. Hartono<sup>1</sup>, M. Munawar<sup>1</sup>

<sup>1</sup>Cardiology and Vascular Department of Binawaluya Cardiac Center

<sup>2</sup>Cardiology and Vascular Department of Sam Ratulangi University

**Background and aims:** Patients with cardiac resynchronization therapy (CRT) implantation will not have the same response in left ventricular ejection fraction (LVEF) after implantation. Patient characteristic is one of the key roles for responsiveness to CRT. The aim of this study is to evaluate the clinical data for predicting the change of LVEF after CRT.

**Materials and method:** The data was collected from 113 related CRT procedures between 2013-2022. This study is a retrospective study from single-centre study. Only patients with new CRT implantation and had pre-CRT and follow-up echocardiography were included in this study. Based on changes in LVEF patients were categorized into “non-responders” (change in EF <5%), “responders” (change in EF 5-19.9%), and “super-responder” (change in EF ≥20%).

**Results:** 58 patients were excluded from this study, of whom 23 patients without complete data, 35 patients were not new CRT implantation (such as generator replacements or lead reposition procedures). A total of 55 patients had complete data, among those patients, 22 patients (40%) were classified as non-responder, responder of 21 patients (38,2%), super responder of 12 patients (21,8%). In this study, LBBB was the predictor for change in LVEF after CRT where patients with LBBB had higher change of LVEF after CRT with the mean difference of 7.93 and p value of 0.04. Other parameters such as sex, history of myocardial infarction, non-ischemic cardiomyopathy, atrial fibrillation (AF), age, body mass index (BMI), QRS duration and left atrial (LA) diameter did not correlate with the change of LVEF after CRT.

**Conclusion:** LBBB is a factor in the improvement of LVEF after CRT implantation. Patient selection is very important in CRT implantation to achieve responder or super-responder. Other factors are not statistically significant in changing LVEF, due to the lack of sample size in this study.

**Keyword:** CRT, responder, super-responder, left ventricular ejection fraction.

Attachment: table 1.

Factors associated with change in LVEF (%) after CRT

Variables	Change LVEF after CRT, mean (sd)	Difference between group of LVEF after CRT (SE), correlation	P value
Sex			
Female	12.08 (16.54)	4.07 (5.37) <sup>a</sup>	0.452
Male	8.01 (14.40)		
History of MI			
Yes	7.82 (13.94)	-2.24 (4.10) <sup>a</sup>	0.587
No	10.06 (16.07)		
Non-Ischemic cardiomyopathy			
Yes	8.07 (18.84)	-0.92 (4.20) <sup>a</sup>	0.826
No	9.0 (12.25)		
LBBB			
Yes	13.29 (14.48)	7.93 (3.90) <sup>a</sup>	0.04*
No	5.36 (14.13)		
AF			
Yes	13.25 (14.59)	6.98 (4.09) <sup>a</sup>	0.094
No	6.26 (14.59)		
Age		0.07 <sup>b</sup>	0.576
BMI		-0.021 <sup>b</sup>	0.881
QRS duration		0.148 <sup>b</sup>	0.280
LA diameter		0.096 <sup>b</sup>	0.485

a mean difference (SE), test used independent sample t-test

b correlation, test used Pearson correlation

\*Statistically significant



**Diagnostic Study of Cornell and Peguero-Lo Presti Criteria In Electrocardiography To Diagnose Left Ventricular Hypertrophy In Hypertensive Patients At Tabanan General Hospital**

A. D. Damara<sup>1</sup>, E. A. Suyasa<sup>2</sup>, D. A. Yasmin<sup>3</sup>

<sup>1</sup>Intern at Departement of Cardiology and Vascular Medicine, Tabanan General Hospital, Tabanan, Indonesia

<sup>2</sup>Cardiologist at Departement of Cardiology and Vascular Medicine, Tabanan General Hospital, Tabanan, Indonesia

<sup>3</sup>Cardiologist at Departement of Cardiology and Vascular Medicine, Prof. Dr. I.G.N.G Ngoerah General Hospital, Denpasar, Indonesia

**Background and aims:** Hypertension is considered as main cardiovascular risk factor that associated with increased morbidity and mortality. Left ventricular hypertrophy (LVH) is cardiac target organ damage that can be detected by echocardiography. However, the availability of echocardiography is still limited, hence the role of ECG to determine LVH is still needed in daily practice. The aim of this study is to assess Cornell and Peguero-Lo Presti criteria in detecting LVH in comparison with echocardiography among hypertensive patients at Tabanan General Hospital.

**Material and methods:** This study was a diagnostic study using cross-sectional design. The data were taken from medical records of hypertensive patients in outpatient clinic of Tabanan General Hospital. The ECG records of patients were interpreted based on Cornell and Peguero-Lo Presti Criteria to detect LVH. The echocardiography results were also obtained from medical records.

**Results:** Out of 111 research subjects, there were 10 subjects (15.15%) detected LVH based on Cornell criteria and 30 subjects (45.45%) detected LVH based on Peguero - Lo Presti criteria whereas 66 subjects (59.46%) detected LVH with echocardiography. The study revealed that Cornell criteria has sensitivity of 15.15%, specificity 93.33% and accuracy of 59.9% while the Peguero-Lo Presti criteria has sensitivity of 45.45%, specificity of 84.44% and accuracy of 66.2%.

**Conclusion:** Peguero-Lo Presti criteria have higher accuracy than Cornell criteria in diagnosing LVH in hypertensive patients according to echocardiography. Based on the results of this study, the Peguero - Lo Presti criteria can be considered as a screening method for the presence of LVH in hypertensive patients in daily practice

**Keywords:** Cornell criteria; left ventricular hypertrophy; Peguero criteria – Lo Presti



**The Correlation between Cardiac Remodeling and Incidence of Paroxysmal Atrial Fibrillation and Supraventricular Beat among Elderly with Hypertensive Heart Disease and The Role of Anti-Hypertensive Agents**

I. P. H. Aryadi<sup>1</sup>, I. D. G. D. Sumajaya<sup>2</sup>

<sup>1</sup>Faculty of Medicine, Universitas Udayana, Bali, Indonesia

<sup>2</sup>Dharma Kerti Hospital, Bali, Indonesia

**Background and aims:** Atrial fibrillation (AF) and supraventricular beat are two of the most common sustained arrhythmias in clinical practice. Recent study has highlighted the impact of cardiac remodeling in both arrhythmias presentation. This study was aimed to be a preliminary study in evaluating the correlation between cardiac remodeling and incidence of paroxysmal AF and supraventricular beat.

**Materials and methods:** A cross-sectional study was conducted during March until June 2022, involving 100 hypertensive heart disease (HHD) elderly patients. Several cardiac remodeling-related echocardiographic markers were assessed, including Left Ventricular Mass Index (LVMI), Relative Wall Thickness (RWT), Tricuspid Annular Plane Systolic Excursion (TAPSE), Left Atrial Volume Index (LAVI), and Left Ventricular End Diastolic Volume Index (LVEDVI). The 24-hour Holter monitoring was applied to all included patients. Spearman's Rho test was conducted to assess the correlation between those markers and incidence of paroxysmal AF and supraventricular beat. Chi-Square test was performed to measure the role of anti-hypertensive agents in both events' occurrence.

**Results:** Most of the patients were females (54%), with the mean age of 69.53±7.54 years old. Patients in this study routinely consumed anti-hypertensive drugs, namely angiotensin converting enzyme-inhibitors (ACE-i) and angiotensin receptor blockers (ARB) (16% and 83%, respectively). Frequent supraventricular beat (>500 beats/24 hours) occurred in 14% of total patients, meanwhile only 9% of them experienced paroxysmal asymptomatic AF. The median and inter-quartile range (IQR) of LVMI, RWT, TAPSE, LAVI and LVEDVI were 119.29±35.94 g/m<sup>2</sup>, 0.51±0.14, 21.74±5.05 mm, 21.78±7.61 ml/m<sup>2</sup>, 69.82±19.85 ml/m<sup>2</sup>, respectively. There was a positively significant correlation between both LAVI and LVEDVI with the incidence of paroxysmal asymptomatic AF ( $p=0.02$ ,  $r=0.23$  and  $p=0.02$ ,  $r=0.24$ , respectively), meanwhile the incidence of frequent supraventricular beat was not correlated with any echocardiographic markers. The consumption of ACE-i and ARB was found as a protective factor against the occurrence of frequent supraventricular beat ( $p<0.01$  and  $p<0.01$ ,  $PR=0.13$ ,  $95\%CI=0.04-0.45$ ), and atrial fibrillation ( $p=0.03$  and  $p=0.04$ ,  $PR=0.21$ ,  $95\%CI=0.05-0.88$ ).

**Conclusion:** There was a significant correlation between cardiac remodeling and the incidence of paroxysmal atrial fibrillation, but not the frequent supraventricular beat. The consumption of anti-hypertensive agents was found to reduce the occurrence of both arrhythmia events.

**Keywords:** cardiac remodeling, paroxysmal atrial fibrillation, supraventricular beat, hypertensive heart disease

**T-wave Area Dispersion in Acute Anterior ST Segment Elevation Myocardial Infarction – Does it Matter?**

L. D. Pradipta<sup>1</sup>, A. Yudanto<sup>1</sup>, P. Ardianto<sup>1</sup>

<sup>1</sup>Department of Cardiology and Vascular Medicine Medicine, Faculty of Medicine, Diponegoro University  
 – Dr. Kariadi Central General Hospital Semarang, Indonesia

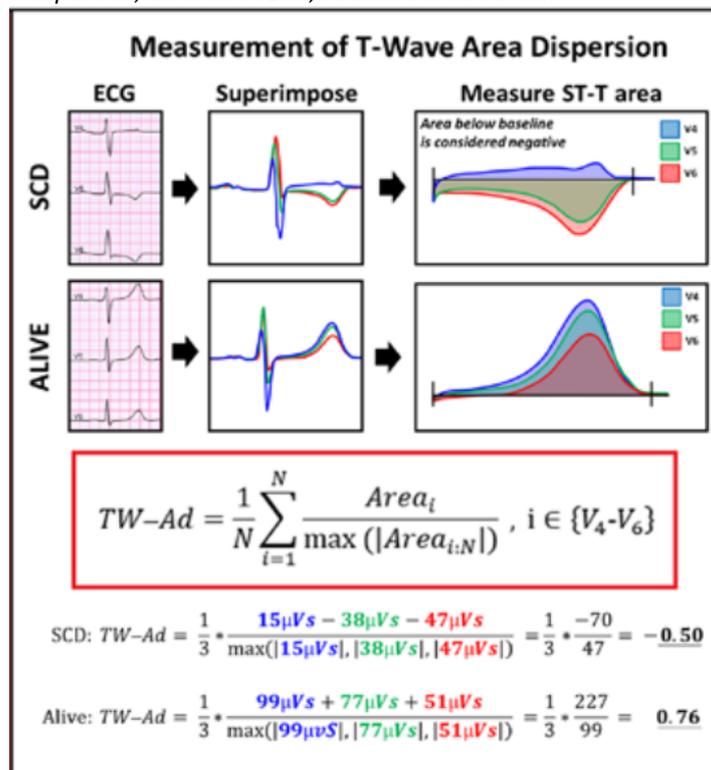
**Background and aims:** Anterior ST-segment elevation myocardial infarction (STEMI) is associated with the worst prognosis of all infarction locations. Myocardial repolarization suffered the most severe devastation caused by myocardial infarction due to more ATP utilization in that phase. In ECG, myocardial repolarization was marked by the T wave which could be particularly abnormal in the setting of myocardial infarction. New ECG repolarization parameter, ‘T-Wave Area Dispersion’ (TWAD), has been defined by Kenttä et al. in 2018. Clustering ability of TWAD for prediction of risk for sudden cardiac death (SCD) has been proven by the authors, working with a large database. This study was conducted to analyze whether TWAD will predict sudden cardiac death in acute anterior STEMI.

**Materials and methods:** A case control study was conducted in patients with acute anterior STEMI in Dr. Kariadi General Hospital Semarang from January 2020 until August 2022. This study comprised patient with acute anterior STEMI who survive and death during hospitalization. TW-Ad was measured from standard 12-lead ECG which taken within 10 minutes after admission in emergency department. TW-Ad was measured between J point and the end of T wave. TW-Ad was calculated as the average of normalized T-wave areas in V<sub>4</sub>, V<sub>5</sub>, and V<sub>6</sub> leads, using the formula which proposed by Kenttä et al. in 2018. The data was descriptively analyzed using IBM SPSS Statistics 26.

**Results:** A total of 40 patients were included, of which 20 patients survive and 20 patients who death during hospitalization. In survive patient, TWAD range from 0.58 until 0.95 with mean of 0.81. Moreover, in nonsurvivor patient, TWAD range from -0.83 until 0.67 with mean -0.32. Lower values of TWAD which less than 0, more found in acute STEMI anterior who death during hospitalization. However, patient who was survive, had TWAD more than 0.

**Conclusion:** Low TWAD which calculated from standard 12-lead ECG, could be important value in predicting the risk of in hospital mortality in patient with acute STEMI anterior.

**Keywords:** T-wave area dispersion; anterior STEMI; sudden cardiac death





## Validity of MENARI Plus (Self Pulse Assessment and Clinical Scoring) Mobile apps For Detecting Atrial Fibrillation in Highrisk Population

M.R. Fadlan<sup>1</sup>, A. Rizal<sup>1</sup>, B. Satrijo<sup>1</sup>, T. Astiawati<sup>2</sup>, M. S. Rohman<sup>1</sup>

<sup>1</sup>Departement of Cardiology and Vascular Medicine, Faculty of Medicine, Universitas Brawijaya - dr.Saiful Anwar General Hospital, Malang East Java, Indonesia

<sup>2</sup>Departement of Cardiology and Vascular Medicine, dr.Iskak General Hospital, East Java, Indonesia

**Background and aims:** Before it's clinically diagnosed, atrial fibrillation (AF) can cause stroke. For improving therapy and prognosis, early diagnoses was needed. In our previous study, we found that MENARI (National program of Self Pulses Assesment) has low accuracy for detecting AF. We developed Self pulse assessment and clinical scoring (MENARI PLUS) based on android apps for increasing their accuracy. The aim of this study to validity of AF screening using MENARI PLUS compared with an ECG recording conducted at the same time using a handheld ECG

**Materials and methods:** We collected from total of 1385 subject's with high risk population according CHA2DS2-VASc Score  $\geq 2$ , age > 50 years attending 8 primary care centers (PCCs) in Malang were invited to take part in AF screening from July 2021 to December 2021. Every participant evaluate self pulse assessment, then evaluate MENARI plus Score on android Apps : Tutorial screen (step for pulse palpation), evaluate self pulse assessment according MENARI PLUS guidance, reporting their symptom in MENARI PLUS apps for Irregular self pulse palpation (MENARI) (4 point each); P: palpitation (2 point); L: oLd (age > 65 years, 2 points); U: fatigUe (1 points); and H: hypertenSion (2 point). These cases had been classified as low or high probability for diagnosing AF (cut off score 7). After that, Every participant performed electrocardiography examination and classified with AF and Sinus Rhythm group.

**Results:** In this study, mean age of this patients were  $61,5 \pm 6,9$  years old and 76% subjects were female. We found 156/1385 (11%) patient's with AF. The average age of the atrial fibrillation group was  $63.6 \pm 5.1$  years old. 17% had no symptoms. with an average CHA2DS2-VASc score 2.9 and 68/156 (43.5%) new cases of AF were detected. Anticoagulants (ACs) could be initiated in 65/68 (95.5%) of these cases. The sensitivity for self pulse palpation was 73.1% (95% CI 68%-76%) and specificity was 68.3% (95% CI 65%-72%). MENARI PLUS had an area under the receiver operating curve (AUC) of 0.86 (95% CI 0.82 to 0.89) with sensitivity per measurement occasion was (84%, 95% CI 82%–88%) and specificity was (87.9%, 95% CI 82%–90%). Positive predictive value for MENARI PLUS was (46.8%, 95% CI 42%–54%) and Negative Predictive value was (97.7%, 95% CI 94%-98%).

**Conclusion :** In this study, we suggested that MENARI PLUS has a high sensitivity and specificity for atrial fibrillation. It is therefore useful for ruling out atrial fibrillation. It may also be a useful screen to apply opportunistically for previously undetected atrial fibrillation.

**Keywords:** atrial fibrillation, scoring system, pulse palpation



**Correlation between Atrial Fibrillation with Left Atrial Diameter in Outpatient Clinic, Dr. Soegiri Lamongan General Hospital, Lamongan, Indonesia.**

R.F. Amalia<sup>1</sup>, M.F. Hadyan<sup>2</sup>, I. Kartikasari<sup>3</sup>

<sup>1</sup>*Simpangan Depok Hospital, Depok, Indonesia;*

<sup>2</sup>*Faculty of Medicine, Universitas Trisakti, Jakarta, Indonesia;*

<sup>3</sup>*Dr. Soegiri Lamongan General Hospital, Lamongan, Indonesia*

**Background and aims:** Atrial fibrillation is the most frequent arrhythmia which is affiliated with increased cardiovascular morbidity and mortality. There are two main etiologies of atrial fibrillation: valvular atrial fibrillation and non-valvular atrial fibrillation. Studies on valvular atrial fibrillation and non-valvular atrial fibrillation are still limited. The general purpose of this study is to find out the correlation between atrial fibrillation with left atrial diameter in valvular heart disease and non-valvular heart disease in order to provide and complete its recent data.

**Materials and methods:** The study used an observational study with cross-sectional design by consecutive sampling in Outpatient Clinic, Dr. Soegiri Lamongan General Hospital, Lamongan, Indonesia. Research data were collected for five months (January - May 2020) by using primary data based on questionnaire interview that recorded age, sex, history taking, physical examination, electrocardiogram, and echocardiography results.

**Results:** 40 subjects were enrolled by using chi-square analysis. Based on this study, 18-59 year-old subjects had bigger percentage of atrial fibrillation which were 55% (22) than  $\geq 60$  year-old subjects that had 45% (18). Female subjects dominated 57,5% (23) more than male subjects that were 42,5% (17). Subjects with left atrial enlargement had 70 (28) whereas, subjects with normal size left atrial had 30% (12), and showed that 52,5% (21) of subjects had valvular atrial fibrillation. Mitral stenosis was the highest cause of valvular atrial fibrillation which was 61,9% (13). In addition, atrial fibrillation was statistically correlated with left atrial diameter ( $p=0,003$ ).

**Conclusion:** Atrial fibrillation is significantly associated with left atrial diameter. Research with different method is needed to have better understanding about valvular atrial fibrillation and non-valvular atrial fibrillation.

**Keywords:** atrial fibrillation, left atrial diameter, valvular atrial fibrillation, non-valvular atrial fibrillation



**Mitral Anular Disjunction as a Predictor of Ventricular Arrhythmias in  
Mitral Valve Prolapse Patients**

S. Metasari<sup>1</sup>, H.E. Rasyid<sup>2</sup>, M. Yanni<sup>2</sup>

1. Cardiology and Vascular Disease, Faculty of Medicine, Universitas Andalas, Padang

2. Department Cardiology and Vascular Disease, M. Djamil Hospital, Padang

**Background and aims :** The incidence of ventricular arrhythmias and sudden cardiac death has been associated with mitral valve prolapse known as arrhythmic mitral valve prolapse. Characterized by the presence of ventricular premature complexes arising from one or both of the posterior mitral, fascicular, and T wave inversions in the inferolateral leads on 12-lead electrocardiography or Holter monitoring. The mechanism of arrhythmias in patients with mitral valve prolapse is not fully understood but bi-leaflet valve prolapse, papillary muscle fibrosis, and Mitral Annulus Disjunction (MAD) are associated with an increased incidence of ventricular arrhythmias caused by systolic curling motion of the mitral annulus and leads to anular hypermobility.

**Materials and methods:** This study is a cross-sectional analytic study of 75 mitral valve prolapse patients with Mitral Annulus Disjunction (MAD) from February-June 2022. The MAD examination was performed using a GE Vivid E95 echocardiography and evaluation of ventricular arrhythmias using a 12-lead ECG and Holter monitoring BTL brand. To determine the value of MAD in predicting the incidence of ventricular arrhythmias, a normality test was performed, then a nonparametric bivariate test was performed with diagnostic analysis to assess the MAD cut-off point value using the receiver operating curve (ROC) procedure.

**Results :** The median value of MAD in mitral valve prolapse patients in this study was 7 mm. The most common type of ventricular arrhythmia found in this study was premature ventricular contraction (PVC) followed by nonsustained VT. The MAD cut-off point as a predictor of ventricular arrhythmias in patients with mitral valve prolapse was 8.5 mm with a sensitivity of 82.6% and a specificity of 84.6%.

**Conclusion:** The value of Mitral Anular Disjunction 8.5 mm is a predictor of the incidence of ventricular arrhythmias in mitral valve prolapse patients.

**Keywords:** mitral annular disjunction, mitral valve prolapse, ventricular arrhythmia



**INITIAL P-WAVE DEFLECTION AND THE RISK OF ARRHYTHMIA IN HETEROTAXY SYNDROME: A  
RETROSPECTIVE SINGLE-CENTER STUDY**

T. S. R. Sembiring<sup>1</sup>; M. F. Adam<sup>1</sup>; D. Y. Hermanto<sup>1,2</sup>; A. A. Sembiring<sup>1,3</sup>; D. A. Hanafy<sup>1,2</sup>; S. B. Raharjo<sup>1,2</sup>; Y. Yuniadi<sup>1,2</sup>

<sup>1</sup>Department of Cardiology and Vascular Medicine, Faculty of Medicine, Universitas Indonesia; <sup>2</sup>Division of Arrhythmia, National Cardiovascular Center Harapan Kita; <sup>3</sup>Division of Pediatric Cardiology and Congenital Heart Disease, National Cardiovascular Center Harapan Kita

**Background and aims:** Heterotaxy syndrome (HS) is associated with complex cardiac malformations and cardiac conduction system abnormalities. Cardiac malformations have been well studied, but less attention has been given to the P waves in electrocardiograms in these syndromes. This study is conducted to present initial P-wave deflection (IPWD) as a representation of probable sino-atrial (SA) node location and its association with arrhythmia in HS.

**Materials and methods:** A retrospective single-center study was conducted involving HS patients admitted from 2017 – 2022. HS was diagnosed by trans-thoracic echocardiography (TTE) performed by our pediatric cardiologists. Only preoperative ECGs were analyzed including any ECGs showing arrhythmias. IPWD was divided into four quadrants based on IPWD at lead I and aVF (positive or negative): right superior (RS): positive I and positive aVF; left superior (LS): negative I and positive aVF; right inferior (RI): positive I and negative aVF; left inferior (LI): negative I and negative aVF

**Results:** A total of 142 patients consisting of 52,1% male and 60,6% right atrial (RA) isomerism were identified. As many as 21,1% patients had documented arrhythmia which was more prevalent in LA- than RA isomerism (26,8% vs 17,4%,  $p < 0.001$ ). In RA isomerism, IPWD were predominantly from the upper quadrant (RS 58,2% vs LS 29,1%). However, in LA isomerism, IPWD were evenly distributed (RS 27,8% vs RI 37% vs LS 14,8 vs LI 12%). SA nodes at lower quadrant were associated with higher occurrences of arrhythmia (OR 4,875; 95% CI: 1,83-12,98,  $p < 0,01$ ) specifically RI SA-nodes in subgroup analysis (OR 3,19; 95% CI: 1,16-8,87,  $p < 0,026$ ).

**Conclusion** IPWD in RA isomerism are mostly from the upper quadrant while it is evenly distributed in LA isomerism. IPWD from lower quadrants, especially at RI, were associated with higher occurrences of arrhythmia.

**Keyword:** Initial P-wave deflection, heterotaxy syndrome, isomeric heart, arrhythmia