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Adherence to European Society of Cardiology Heart Failure Treatment Guideline in Haji Adam Malik General Hospital Medan

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Abstract. Background. Heart failure is a public health problem and the main cause of morbidity and mortality in the world. The goal of the therapy is to reduce symptoms, prevents rehospitalization and increases survivability. **Objective.** To evaluate the adherence to the European Society of Cardiology for heart failure treatment at H. Adam Malik Medan hospital. **Methods**. The study was descriptive observational cross sectional design with medical record data of heart failure at H. Adam Malik Hospital, using consecutive sampling method. The adherence of guidelines was assessed by: (1) drug prescribing ("yes" or "no"), and (2) guideline adherence indicator (GAI), both GAI-3 or GAI-5, by calculating the proportion as the number of drugs prescribed by number of drugs indicated to the ESC guidelines**. Results**. From research, the predominant GAI-3 and GAI-5 were High, which were 54.9% and 59.5%, respectively. The recommended drug used based on indications were ACE-i / ARB (89.1%), beta-blockers (83.4%), MRA (73.6%), diuretics (93.7%), and digitalis (20,8%). **Conclusion.** The predominant category in adherence to the ESC heart failure treatment guidelines based on GAI-3 and GAI-5 is High.

Keyword: Heart Failure, Guidelines, ESC, GAI

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1 Introduction

Heart failure is a group of clinical syndromes which is caused by structural or functional heart disorders which disrupt the ability of the ventricle to fill or eject blood [1,2]. The prevalence of heart failure in Indonesia and the world is still high [3,4].

Heart failure therapy must be done according to the suitable treatment to increase the success of treatment, quality of life, and reduce both the mortality and morbidity of the patient [3,4]. Appropriate therapy for this condition has been proven effective in reducing the incidence of heart failure [5].

The guideline for heart failure treatment had been released to help doctors in giving the best treatment for the patient The guideline was released by the European Society of Cardiology (ESC) which contain the consensus for pharmacological and non-pharmacological criteria [6]. The ESC's treatment recommendation for heart failure patients are angiotensin converting enzyme inhibitor (ACE-I) or angiotensin receptor blocker (ARB), beta blockers, and mineralcorticoid receptor antagonist (MRA) for heart failure therapy. Diuretics could be used in combination to relieve symptoms and signs of congestion [4].

This study is a continuation from a previous study conducted by Andika Sitepu and Khalis Hamdani during the period of January 2013 - June 2014. The aim of this study is to see whether or not there is a difference in obedience of the ESC guideline on heart failure patients in Adam Malik Central General Hospital, Medan.

2 Methods

This is descriptive observational study which was conducted on July – December 2019. This study uses medical record data of 284 patients chronic heart failure with reduced ejection fraction that meets the inclusion and exclusion criteria at the Haji Adam Malik General Hospital Medan from January 2015 - December 2018. The samples were collected by consecutive sampling method from 2015 - 2018 patients medical record until get a total of 284 patients.

Inclusion criteria were: (i) age over 18 years, (ii) outpatient with chronic heart failure, (iii) reduced ejection fraction ≤ 40%. We excluded Patient presenting with: (i) Asthma, (ii) COPD (Chronic Obstruction Pulmonary Disease) acute exacerbation, (iii) symptomatic hypotension (systolic blood pressure < 90 mmHg), (iv) severe aortic stenosis, (v) severe mitral stenosis, (vi) renal artery stenosis and (vii) hyperkalemia.

The guidelines adherence indicator (GAI) was used to evaluate physician adherence to the ESC guidelines for the treatment of chronic heart failure with reduces ejection fraction[6]. The GAI specified into two different groups. GAI-3 consists of ACE-I or ARB, beta-blocker, and MRA, considering the substantial evidence to improve clinical outcome. The GAI-5, in addition to the

three pharmacological classes, considered the use of diuretics and digitalis, which predominantly targets improving symptoms. Furthermore, GAI-3 was three categories; these were low adherence (0 or 33%), moderate adherence (67%), and high adherence (100%).In the same way, GAI-5 was three categories; these were low adherence (0-20%), moderate adherence (40-60%), and high adherence (80-100%).

3   Results

Table 1 Patients characteristics

Characteristics	Population (n = 284)	Percentage (%)
Gender :		
Male	221	77,8
Female	63	22,2
Age :		
<50 tahun	91	32,0
50 - 75 tahun	185	65,1
>75 tahun	8	2,8

Table 1 show patients' heart failure characteristics that, male tend to develop heart failure than female from 284 patients diagnosed with heart failure. By age, the peak incidence of HCC was in 50-75 years (65,1%). For <50 years, there are 91 patients diagnosed with heart failure (32,0%), and >75 years, there are 8 patients diagnosed with heart failure (2,8%).

Table 2 Pharmacology treatments for heart failure

Medication	Population (n = 284)
Captopril	148 (52,1)
Ramipril	53 (18,7)
Valsartan	42 (14,8)
Candensartan	9 (3,2)
Irbesartan	1 (0,4)
Bisoprolol	235 (82,7)
Carvedilol	2 (0,7)
Spironolakton	209 (73,6)

Furosemid	266 (93,7)
Digoxin	59 (20,8)

Table 2 shows that the prescription rates for ACE-I/ARBs were 89,2%, followed by beta-blockers (83,4%), and MRAs (73,6%). In addition to the three substance classes, the prescription rates diuretic was the highest (93,7%) and the use of digitalis was 20,8%.

Table 3 guideline adherence indicators

	Low, n (%)	Moderate, n (%)	High, n (%)	Median (IQR)
GAI-3	25 (8,8)	103 (36,3)	156 (54,9)	100% (67-100%)
GAI-5	4 (1,4)	111 (39,1)	169 (59,5)	80% (60-80%)

Table 3 shows that the predominant category for both GAI-3 and GAI-5 were high, 156 (54.9%) and 169 (59.5%) respectively. Table 3 also shows the median values of both GAI-3 (100%) and GAI-5 (80%) were also calculated to determine the overall quality of pharmacology.

4 Discussion

From the study, we get that heart failure is more dominant in male than in female. This is similar as the other studies from Sitepu & Hamdani, Jensen et al., and Savaresa & Lund [6,8,9]. This study also shows that the incidence of heart failure increase corresponding with the increase of age. The result is similar with previous study from Sitepu & Hamdani, Lee et al., and Riskesdas [6,10,11]. Despite that, due to lower life expectancy in Indonesia [10], the average age of patients is younger compared to the other studies.

ESC guidelines recommend neurohormonal antagonist heart failure drugs that must be given to heart failure patients with reduced ejection fractions namely ACE-I/ARB, beta-blockers, and MRA [12]. The prescription rates for ACE-I/ARBs was 89,2%, followed by beta-blockers (83,4%), and MRAs (73,6%). The result shows improvement of prescription rates for neurohormonal antagonist heart failure treatment from previous study [6]. Diuretics were the most frequently prescribed in this study, with 93,7%, this finding in line with previous study [6]. Other studies also reported the use of diuretics as the most commonly prescribed drugs [13,14]. In our study, high prescription diuretic drugs may be due to most patients experiencing signs of congestion which is dyspnea.

The adherence to the ESC guidelines was associated with better prognosis, improved clinical outcome, fewer cardiovascular hospitalizations and delayed time to rehospitalization [6]. In our study, we found that the predominant categories of GAI-3 (54,9%) and GAI-5 (59,5%) were high, similar to the other study [14,15]. The adherence of both GAI-3 and GAI-5 based on ESC guidelines has increased from moderate to high compared to previous studies [6]. The median

values of GAI-3 and GAI-5 were also used to evaluate the pharmacotherapy quality [14]. This results shows a significant improvement of median values of GAI-3 and GAI-5 from previous studies. This might be possible because the distribution of drugs in the Adam Malik General Hospital was sufficient.

5 Conclusion

This is the follow-up study from previous study conducted by Sitepu and Hamdani. In our study, the adherence to ESC guidelines for the treatment of heart failure has improved significantly compared to previous study, from moderate to high adherence.

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