

Analysis of Heart Failure Treatment Costs based on the INA-CBGs (Indonesian Case Base Groups) Tariff Package for Patients with National Health Insurance

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ABSTRACT: The national health insurance program (JKN) provided by the government can guarantee the health of all Indonesian people in a comprehensive, inexpensive, affordable and quality manner through a referral system that is running well. This study aimed to determine the cost of heart failure treatment in the INA-CBG tariff package for outpatient JKN patients. This study is a quantitative descriptive study whose data were taken retrospectively. The sampling technique used was total sampling by taking secondary data from medical record, which included sociodemographic characteristics, prescribing patterns and drug costs at a hospital in Indonesia in 2021. The results showed the financing for treating heart failure patients in October–December 2021 amounting to Rp13,207,307, following INA CBG's tariff guidelines.

Keywords: Heart Failure, Outpatients, Cost Composition, INA-CBGs Rates

1. INTRODUCTION

Cardiovascular disease is a global threat and the world's number one cause of death. Heart failure is one of the cardiovascular diseases suffered by the world community.¹ Heart failure is characterized by the inability of the heart to pump enough blood to meet the needs of oxygen and nutrients in the body's tissues, with excess (overload) of blood volume, tissue perfusion is not strong, and poor activity tolerance.²

Heart failure is a global epidemic with an increasing prevalence, morbidity and mortality incidence. American Heart Association (AHA) showed it is estimated that patients with heart failure will increase by about 46% by 2030.³ The prevalence of heart failure from 2012 to 2030 is predicted to increase by 46%, with more than eight million sufferers aged over 18 years. . The prevalence of heart failure in Asia ranges from 1.26% to 6.7%. Mortality from heart failure was significantly higher in patients in Southeast Asia (13.0%) compared to South Asia (7.5%) and East Asia (7.4%).⁴

Riskesdas 2018 reported that the prevalence of heart disease based on doctors' diagnoses in Indonesia reached 1.5%, with the highest prevalence in North Kalimantan at 2.2%, Yogyakarta at 2%, and Gorontalo at 2%. In addition to these three provinces, there are also 8 other provinces with a higher prevalence compared to the national prevalence, namely Aceh (1.6%), West Sumatra (1.6%), DKI Jakarta (1.9%), West Java (1.6%), Central Java (1.6%), East Kalimantan (1.9%), North Sulawesi (1.8%) and Central Sulawesi (1.9%).⁵ According to Riskesdas 2013, the prevalence of heart failure in Indonesia is 0.13%, and 0.3% symptoms of the total population aged 18 years and over.⁵

Health costs in Indonesia tend to increase due to the pattern of degenerative diseases, orientation to curative financing, individual out-of-pocket payments (fee for service), and advanced technology. With the existing conditions and situations, access and quality of health services are threatened, especially for people who

cannot afford them; this causes the level of public health to be lower. Therefore, a health system is needed so that it is healthy for the upper class and all circles of society.⁶

The National Health Insurance Program (JKN) is an effort made by the government to ensure the health of all Indonesian people in a comprehensive, cheap, affordable and quality manner through a referral system that is running well.⁷ Pharmacoeconomics evaluates clinical aspects, health economics, individual behaviour or welfare, and use of medicinal products, services and programs, which are focused on total costs (inputs) and expenditures (outcomes). Several types of pharmacoeconomic analysis studies are the cost of illness analysis.⁸ The INA-CBGs tariff is the number of claim payments by JKN to advanced-level referral health facilities for service packages based on disease diagnosis groupings and procedures.⁹

Fikma (2017) reported that the use of three most common heart failure drugs was bisoprolol (β -blocker) by 26.1%, furosemide (diuretic) by 25.5%, and spironolactone by 20.9% at the Cardiology Polyclinic of Dr. M. Djamil Hospital.¹⁰ Bisoprolol is equivalent to enalapril in reducing mortality and is superior in reducing the risk of sudden death.¹¹

The INA-CBGs tariff is a package tariff that includes all components of hospital resources used in both medical and non-medical services.¹² The INA-CBGs payment system is grouped based on diagnosis and procedure codes with clinically correlated resources. The hospital will receive payment from the average of the group's funds with the diagnosis and procedure codes. INA-CBGs, as the Ministry of Health, has used a payment system to improve the quality and quality of health services.¹³ It is necessary to research the cost of heart failure treatment compared to the INA-CBGs package rates so that prescription financing for heart failure patients can be more efficient, mainly for outpatient JKN patients in the capital city of Jakarta.

2. METHOD

2.1. Research design

The design of this study used a quantitative descriptive method. Data collection was carried out retrospectively. The target sample is Heart Failure Outpatient JKN patients recorded in medical records and financial claim data in October – December 2021. A sampling of data using the total sampling technique. The study was conducted at a hospital in Central Jakarta, Indonesia.

2.2. Sample

Sampling using data from all JKN patients diagnosed with heart failure at a hospital in Central Jakarta for the period October - December 2021 who meet the inclusion and exclusion criteria was carried out with a total sampling technique of 62 patients.

The sample in the study was based on the inclusion and exclusion criteria as follows:

- 1) Inclusion Criteria:
 - a. Data from patients diagnosed with heart failure with the International Classification of Diseases (ICD) code I50.0 and INA-CBGs code Q-5-44-0 who underwent outpatient treatment.
 - b. JKN patients who have been claimed in October – December 2021.
 - c. Patients whose drug costs and INA-CBG package rates are known.
- 2) Exclusion Criteria:
 - a. Incomplete or missing patient data

2.3. Data analysis

Data analysis used univariate descriptive analysis. The data that have been obtained are grouped into 3 groups, namely patient characteristics based on sociodemography in the form of gender, age, history of complications, and types of comorbidities, patient characteristics based on treatment patterns, drug class, and type of heart failure medication, and characteristics of heart failure treatment based on the type of treatment in heart failure patients and the total cost of treatment. Calculating drug costs is done by adding up the cost of each drug use for each patient to get the total cost of drug use and then calculating the total and the difference between treatment costs and INA-CBGs rates each month.

3. RESULT AND DISCUSSION

This study collected 62 samples that met the inclusion and exclusion criteria. Table 3.1 contains data on the percentage of sociodemographic characteristics, including gender, age and disease complications.

Table 3.1 Sociodemographic Characteristics, History of Complications, and Types of Comorbidities

No.	Sociodemographic Characteristics	Number of patients (n=62)	Percentage (%)
1.	Gender		
	a. Woman	34	54,84
	b. Man	28	45,16
2.	Age		
	a. 15-44 Years	2	3,23
	b. 45-64 Years	36	58,06
	c. ≥ 65 Years	24	38,71
3.	History of Complication		
	a. ≤ 2	59	95,16
	b. > 2	3	4,84
4.	Types of Comorbidities		
	a. Atherosclerosis	55	88,71
	b. Diabetes Mellitus Type 2	6	9,68
	c. Hypertension	3	4,84
	d. Atrial Fibrillation And Flutter	2	3,23
	e. Angina Pectoris	2	3,23
	f. Chronic Kidney Disease	2	3,23
	g. Chronic Obstructive Pulmonary Disease (COPD)	1	1,61
	h. Mitral Valve Prolapse	1	1,61
	i. Vertigo	1	1,61

Table 3.1 showed that most patients who experienced heart failure in October–December 2021 were women, as many as 34 people (54.84%). Heart failure drugs were most widely prescribed to female patients, namely 34 patients (54.84%), while for men, as many as 28 patients (45.16%). This result is in line with the study of Gigih Kenanga Sari et al. (2020), who reported more female heart failure patients (52.44%).¹⁴ compared to men (47.56%). Men have less estrogen than women. The hormone estrogen can provide a protective effect or protection in the bloodstream from the heart to the rest of the body or vice versa. However, the amount of estrogen will decrease as you enter menopause. So that when entering menopause, both women and men have the same opportunity to experience cardiovascular disorders.¹⁵ The age group using heart failure drugs is in the age range of 45-64 years, 58.06%. Heart failure cases increase at the age of 40 years and over due to a decrease in the function of internal organ systems with age, including the cardiovascular system.

The aortic and arterial systems also stiffen with age because of elastic fibres loss in the medial layer of the arteries.¹⁶ Most patients with heart failure had 2 complications (95.16%). The type of comorbidities most patients suffered from was atherosclerotic, with as many as 55 people (88.71%). Atherosclerosis disrupts blood flow to the heart, resulting in an imbalance between myocardial oxygen demand and oxygen supply.¹⁷

Table 3.2 Number of Prescribing Heart Failure Drugs

No	Prescribing Heart Failure Drugs	Number of Prescription (n=62)	Percentage (%)
A	Number of types of heart failure drugs used.		
	- 1 Types	5	8,06
	- 2 Types	15	24,20
	- 3 Types	21	33,87
	- 4 Types	13	20,97
	- 5 Types	8	12,90
B.	Class and type of drug		
1	Angiotensin II Receptor Blocker (ARB)		
	- Candesartan	45	72,58
2	Diuretic		
	- Furosemide	44	70,96
	- Hydrochlorothiazide	4	6,45
3	Antagonis Aldosteron/ Spironolactone	31	50
4	Beta Bloker		
	- Bisoprolol	25	40,32
	- V-Blok (Carvedilol)	13	20,96
5	Vasodilator /ISDN	14	22,58
6	Digoxin	10	16,13
7	Angiotensin Converting Enzyme Inhibitor (ACE-i)		
	- Ramipril	3	4,84
	- Captopril	1	1,61

Table 3.2 shows that most patients were prescribed 3 types of heart failure drugs (33.87%). The most widely used heart failure drugs are Angiotensin Receptor Blocker's (ARBs) and diuretics, with the most frequently prescribed drugs being Candesartan (72.58%) and Furosemide (70.96%). This result is in line with Tri Wulandari's research (2015) which reported that the most widely used drugs in heart failure patients were diuretics at 63.50% and Angiotensin II Receptor Blockers (ARBs) at 23.75%. ARB drugs are an alternative for patients who cannot tolerate ACE inhibitors. ARB drugs also do not have a side effect of dry cough, unlike ACE inhibitor drugs, so the use of ARB drugs is more than ACE inhibitors.¹⁸ Angiotensin II Receptor Blocker (ARB) group effectively lowers blood pressure in patients with high renin levels.¹⁹ Therapy with ARBs can improve ventricular function and quality of life and reduce hospitalization rates due to worsening heart failure.²⁰ Alberto et al. (2015) also stated that 90% of heart failure patients in hospital cases use diuretics as an initial therapeutic approach.²¹ The diuretic group Loop diuretics are prescribed more often than thiazides because loop diuretics have a higher diuresis and natriuresis efficiency.²²

Table 5.1.3 Characteristics of Heart Failure Treatment by Type of Treatment and Total Cost of Treatment

No	Types of treatment in heart failure patients	Number of Patients	Percentage (%)	Total Costs (IDR)
1	1 heart failure drug + 1 other drug	1	1,54	35.529
2	1 heart failure drug + 2 other drugs	2	3,08	57.736
3	1 heart failure drug + 3 other drugs	2	3,08	281.324
4	1 heart failure drug + 4 other drugs	1	1,54	228.421
5	2 heart failure drugs + 1	2	3,08	302.994

	other drug			
6	2 heart failure drugs + 2 other drugs	7	10,77	871.219
7	2 heart failure drugs + 3 other drugs	3	4,62	827.25
8	2 heart failure drugs + 4 other drugs	2	3,08	1.085.864
9	2 heart failure drugs + 5 other drugs	2	3,08	437.957
10	3 heart failure drugs + 1 other drug	3	4,62	363.853
11	3 heart failure drugs + 2 other drugs	12	18,46	2.292.967
12	3 heart failure drugs + 3 other drugs	7	10,77	1.854.300
13	3 heart failure drugs + 5 other drugs	1	1,54	298.723
12	4 heart failure drugs + 1 other drug	3	4,62	212.745
13	4 heart failure drugs + 2 other drugs	3	4,62	474.792
14	4 heart failure drugs + 3 other drugs	5	7,69	1.952.531
15	4 heart failure drugs + 4 other drugs	1	1,54	242.149
16	4 heart failure drugs + 5 other drugs	1	1,54	251.998
17	5 heart failure drugs + 1 other drug	1	1,54	23.831
18	5 heart failure drugs + 2 other drugs	4	6,15	497.096
19	5 heart failure drugs + 3 other drugs	2	3,08	614.028
Total (IDR)		65	100	13.207.307

Table 3.3 shows that most patients received prescriptions for 3 drugs for heart failure with 2 other drugs (18.46%) with a total cost of IDR 2,292,967. This value is greater than the combination of other prescriptions.

Table 3.3. Comparison of Total Patient Treatment Costs and INA-CBGs Rates for Outpatient Heart Failure

Month	Cost of prescription heart failure drugs		Cost difference (IDR)
	Total Costs (IDR)	Total Tariff INA-CBGs (IDR)	
October	3.957.613	4.617.600	659.987
November	5.609.929	5.579.600	-30.329
December	3.639.765	4.232.800	593.035
Total Costs (IDR)	13.207.307	14.430.000	1.222.693

The total cost of treatment in November 2021 is IDR 5,609,929 with a total INA-CBG rate of IDR 5,579,600, so that in November 2021, the total cost of treatment is higher than the INA-CBG rate with a negative difference of IDR 30,329. However, from October–December 2021, the total cost of treatment was IDR 13,207,307, the

total cost was below the INA CBG's tariff (IDR14,430,000), which means that the hospital did not suffer a loss due to financing following the INA CBG's tariff guidelines. The direct medical financing component, which includes drug therapy costs and service costs, is borne by JKN. Variations in the use of drugs (generic/branded), the dose of the drug used and a large number of drugs can affect the amount of financing on the cost of drug therapy. Around 35-40% of the cost is used for drugs; drug costs can be streamlined by converting branded drugs into generic drugs so that the price is lower while considering good quality.

4. CONCLUSION

The drugs most frequently prescribed to patients were Candesartan (72.58%) and Furosemide (70.96%). Patients who received a combination of 3 drugs for heart failure and 2 other drugs had the highest total cost of Rp. 2,292,967. The total cost of treatment for the period October - December 2021 is IDR 13,207,307. The total cost is below the INA CBG rate (IDR 14,430,000), which means the costs incurred are in accordance with INA CBG's tariff guidelines

5. REFERENCES

1. Lainscak M, Spoletini I, Coats A. Definition and Classification of Heart Failure. *Int Cardiovasc Forum J*. 2017;10:3–7.
2. Black, JM & Hawks J. *Medical Surgical Nursing (Vol 2)*. Jakarta: Salemba Medika; 2014.
3. Mozaffarian D, Benjamin EJ, Go AS, Arnett DK, Blaha MJ, Cushman M, et al. Heart disease and stroke statistics-2015 update : A report from the American Heart Association. *Circulation*. 2015;131(4):e29–39.
4. Benjamin EJ, Muntner P, Alonso A, Bittencourt MS, Callaway CW, Carson AP, et al. Heart Disease and Stroke Statistics-2019 Update: A Report From the American Heart Association. *Circulation*. 2019;139(10):e56–528.
5. Kementerian Kesehatan Republik Indonesia. Laporan Nasional RISKESDAS 2018. Kementerian Kesehat RI. 2018;1–582.
6. Tusshaleha LA. an Analysis on the Compatibility of Real Cost and Ina-Cbgs Cost Determination in Rectum Cancer Chemotherapy Patient To the Implementation of National Health Insurance in Sanglah Central General Hospital of Denpasar in 2014. *J Ilm Mandala Educ*. 2018;4(1):156.
7. Primasari KL. Analisis Sistem Rujukan Jaminan Kesehatan Nasional RSUD. Dr. Adjidarmo Kabupaten Lebak. *J Adm Kebijakan Kesehat*. 2015;1(2):78–86.
8. Andayani TM. *Farmakoekonomi: Prinsip dan Metodologi*. Yogyakarta: Bursa Ilmu; 2013. 3–37 p.
9. Kementerian Kesehatan RI. Indonesian Case Based Groups (INA-CBG's) dan non Indonesian Case Based. Peratur Menteri Kesehat Republik Indones Nomor 52 Tahun 2016 Tentang Standar Tarif Pelayanan Kesehat Dalam Penyelenggaraan Progr Jaminan Kesehat. 2016;
10. Juwita DA, Si M. Evaluasi Penggunaan Obat Pada Pasien Gagal Jantung Kongestif di Poliklinik Jantung RSUP dr. M. Djamil Padang. 2019;(1411011019).
11. Rempengan SH. Peran Terkini Beta Bloker Pada Pengobatan Kardiovaskular. Cholid, Dr.Tri Tjahyono, SpJP F, editor. Jakarta: Badan Penerbit Fakultas Kedokteran UI; 2014.
12. Kementerian Kesehatan Republik Indonesia. Peraturan Menteri Kesehatan Republik Indonesia Nomor 27 Tahun 2014 tentang Petunjuk Teknis Sistem Indonesia Case Base Groups (INA-CBGs). In 2014.
13. KEMENKES, R. I. Pedoman Penerapan Kajian Farmakoekonomi. *Jakarta: Kementerian Kesehatan Republik Indonesia*, 2013, 6.
14. Gigih O, Sari K, Purwanjani W. Analisis Biaya Pasien Gagal Jantung Rawat Inap JAMKESMAS Di RSUP Dr. Sardjito Yogyakarta. *J TSCD3Kep*. 2020;5(2):24–31.
15. Utomo DE, Ratnasari F, Andrian A. Hubungan Self Care Management Dengan Kualitas Hidup Pasien Congestive Heart Failure. *J Kesehat*. 2019;8(2):98–108.
16. Purbianto, Agustanti D. Analisis Faktor Risiko Gagal Jantung Di RSUD dr. H. Abdul Moeloek Provinsi Lampung. *J Keperawatan*. 2015;XI(2):194–203.
17. Harigustian Y, Dewi A, Khoiriyati A. Gambaran Karakteristik Pasien Gagal Jantung Usia 45 – 65 Tahun Di Rumah Sakit Pku Muhammadiyah Gamping Sleman. *Indones J Nurs Pract*. 2016;1(1):55–60.
18. Wulandari T, Nurmainah, Robiyanto. Gambaran Penggunaan Obat Pada Pasien Gagal Jantung Kongestif

- Rawat Inap Di Rumah Sakit Sultan Syarif Mohamad Alkadrie Pontianak. J Farm Kalbar. 2015;3(1):1–9.
19. Riannur T. Analisis Biaya Minimal Candesartan Dibandingkan Amlodipin Pada Pasien Hipertensi Rawat Jalan Di Rs “X” Kota Samarinda. Pros Sekol Tinggi Ilmu Kesehat 2021;94–103.
 20. Kementerian Kesehatan Republik Indonesia. Petunjuk Teknis Penatalaksanaan Penyakit Kardiovaskular Untuk Dokter. In Kepala Pusat Kesehatan Haji; 2017. p. 1–60.
 21. Palazzuoli A, Ruocco G, Ronco C, McCullough PA. Loop diuretics in acute heart failure: Beyond the decongestive relief for the kidney. Crit Care. 2015;19(1):1–7.
 22. Siswanto BB dkk. Pedoman Tatalaksana Gagal Jantung. Perhimpunan Dokter Spesialis Kardiovaskular Indonesia. In Jakarta: PERKI; 2015.

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