Differences in Indonesian Case Base Groups rates and Inpatient-Outpatient Real Costs of Ischemic Stroke Patients at Panti Rapih Hospital Yogyakarta

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ABSTRACT

Indonesian SocialSecurity Agency (BPJS) reported that treatment for stroke costs about Rp 1.27 trillion in 2018, which increasedby 10.4% compared to 2015 (with Rp 1.15 trillion). In 2016, WHO (World Health Organization) reported that stroke ranks 3rd, after heart disease and cancer. This study aimed to analyze the differencesbetween INACBG's rates and the real costs of inpatient-outpatient care for ischemic stroke patients at PantiRapih Hospital, Yogyakarta.

This study was a cross-sectional study using a descriptive comparative approach. This study was conducted over a 1-year period starting from January 1 to December 31, 2021. Data were collected through medical records, financial data, and pharmacological data. Data were analyzed using a One-sample t-test to compare the real total costs and the total INA-CBG's rates for inpatient and outpatient care.

The characteristics of the subjects showed that most of the patients were men (69.7%), aged > 70 years (40.4%), comorbid with > 1 comorbid (71.7%), length of stay $5 - 10$ days (70.7%), and class I treatment class (43.4%). The results showed that the characteristics of the outpatients did not show a significant relationship to direct medical costs ($p > 0.05$). Patient's age, length of stay, and class treatment of care showed a significant relationship to the direct medical costs of hospitalization ($p < 0.05$). Furthermore, the Indonesian Case Base Groups (INACBGs) rates for outpatient carewere shown to be lower than the average real costs. This showed that this hospital's real cost of outpatient treatment was less than the INA-CBG's rates. Otherwise, the INA-CBG's rates for inpatient care were higher than the average real cost. This shows that the real cost of hospitalization was sufficient to pay for patient care except for stroke hospitalization in mild cases.

Keywords: INACBG's, real costs, ischemic stroke, BPJS

I. INTRODUCTION

Stroke is the main cause of lifetime disability, leading to functional impairment and activity limitations that cause decreases in quality of life [1]. In addition, 20% of stroke survivors still need treatment after 3 months post-stroke, while 15-30% of the sufferer experiences permanent disability [2]. The level of physical and mental disability can affect the patient's life in various aspects (physical, emotional, psychological, cognitive, and social), later affecting the quality of life of post-stroke patients. This study aimed to determine the utility of ischemic stroke patients based on the level of disability and factors that affect the quality of life of stroke patients.

According to Janis (2014), with the existence of the BPJS' (Badan PenyelenggaraJaminanSosial/Indonesian Social Security Agency) policy, people who were previously unable to pay for health services now can reach health services so that the demand for health services is high. BPJS, which has the SJSN (SistemJaminanSosial Nasional/National Social Security System) concept, has shown success because the transformation of Askes to BPJS has good performance potential. To maximize health service improvement amid limited available resources, it is time for a cost-effectiveness analysis or other more in-depth pharmacoeconomic studies to be applied in the drug selection process. The application of pharmacoeconomic studies is carried out to select and implement the program or treatment that has the highest cost-effectiveness. Pharmacoeconomic studies can be used in preparing hospital formularies in healthcare facilities, such as hospitals. This formulary plays an essential role in the rational use of drugs[3]. The Indonesian population aged over 40 years is expected to increase by 34.4% from 73.4 million to 98.7 million in 2020, with an increase in hypertension as a risk factor of 6.8%. An increase in the prevalence of stroke by 20% causes the economic burden of the stroke to increase by 56.6% from $0.29 billion to $0.45 billion[4]. BPJS data reported that stroke treatment cost about Rp 1.27 trillion in 2018, which increased by 10.4% compared to 2015 (with Rp 1.15 trillion)[5].

Implementing INA-CBG (Indonesia Case Based Groups) on hospital financing for stroke patients requires treatment planning and cost analysis because stroke requires high costs so that hospitals can make cost savings and are expected to be a solution in controlling health service costs. This study aims to find compatibility between outpatient-inpatient real costs and INA-CBG's rates of ischemic stroke patients.

The value of novelty in this study is to obtain information on the suitability of INA-CBG's rates with real cost needs in the field. If it does not meet the needs, BPJS health

insurance policyholders can use the severity of ischemic stroke as a reference to examine more deeply the reports in the field that there is a discrepancy between the real costs and the rates set by BPJS at the INACBG. This study is different from other studies because it helps to know the difference in INA-CBG's rates compared to the real costs of outpatient and inpatient care so that it can be used as data for BPJS to analyze whether the INA-CBG's rates are relevant to the need for hospital funds for stroke or not.

II.   METHODS

The study was conducted using a cross-sectional design witha descriptive comparative approach to determine the difference between the real total costs and the total INA-CBGs rates for inpatient and outpatient ischemic stroke patients. Data were collected through medical records, financial data, and pharmacological data. Data were analyzed using a One-sample t-test to compare the real total costs and the total INA-CBG's rates for inpatient and outpatient care.

The population taken was ischemic stroke patients in the rehabilitation stage on 1 January 2021 - 31 December 2021 at Panti Rapih Hospital, Yogyakarta, retrospectively.

Sample Size

Sampling Method

Subjects in this study werecollected using a consecutive sampling technique. Consecutive sampling is a sampling technique in which all subjects who come and meet the selection criteria are included in the study until the required number of subjects is met.

Big Formula

The sampling formula used in this research is the Lemeshow formula.

$$n = \frac{z\alpha^2 \, PQ}{d^2}$$

$Q = 1 - P$

Information :

α = significance level (defined by research)

P = The proportion of the disease or condition to be investigated

d = desired level of absolute accuracy (defined by the researcher)

$\alpha = 0.05$ $Z\alpha = 1.96$ (Semarang City Health Office data)

$P = 90\% = 0.90$

$d = 10\% = 0.10$

$$n = \frac{(1.96)^2 \times 0.90 \times (1-0.90)}{(0.1)^2}$$

$$n = 0.345/0.01 = 34.5$$

n=34

In this study, 10% of the research sample was also added to anticipateddropouts. The final sample size determined for this study was 38 patients.

N = n/(1-f)

= 34/(1-10%)

= 34/0.9

= 37.77

= 38

Information :

N : total subjects

f : estimated proportion of drop out (10%)

n : the number of samples used

Subjects' Criteria

Inclusion Criteria

Ischemic stroke patients undergoing outpatient and inpatient care

   - Patients with complete medical record data,

   - Minimum age 25 years.

Exclusion Criteria

- Patients who were hospitalized and then sent home due to personal requests, and

- Patients with incomplete medical records and financial data.

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III. RESULTS AND DISCUSSION

Sociodemographic Data of the Subjects

Patient characteristics included age, gender, length of care, treatment class, research location, and average frequency of visits. Table 1 shows the characteristics of the largest ischemic stroke patientsaged > 70 years (40.4%), and the results of this study were similarto the previous study stating that the risk of stroke will double after the age of 55 years [6].

The proportion of men (53.15%) was greater than women. This showed that men have a greater risk than women[7]. The results of a 2017 study stated that the percentage of ischemic stroke patients was for women 49.5% (49.2%–49.9%) and men 50, 5% (50.1%–50.8%) [8]

Table 1. Characteristics of ischemic stroke outpatients (n=99)

Subject's characteristics		Number of Patients	Percentage (%)	p
Gender	Men	69	69, 7	0,238
	Women	30	30,3	
Age (years)	< 41	0	0	0,891
	41-50	5	5,1	
	51-60	22	22,2	
	61-70	32	32,3	
	> 70	40	59,6	

Source: Secondary Data

Table 2. Characteristics of ischemic stroke inpatients (n=99)

Subject's characteristics		Number of Patients	Percentage (%)	p
Gender	Men	69	69,70	0,411
	Women	30	30,30	
Age (Years)	< 41	0	0,00	0,000
	41-50	5	5,05	
	51-60	22	22,22	
	61-70	32	32,32	
	> 70	40	40,40	
Comorbid	No comorbid	5	5,05	0,434
	With 1 comorbid	23	23,23	
	With > 1 comorbids	71	71,72	
Length of stay (days)	< 5	14	14,14	0,000
	5 - 10	70	70,71	
	11 - 15	14	14,14	
	> 15	1	1,01	
Treatment class	Class III	38	38,38	0,000
	Class II	18	18,18	
	Class I	43	43,43	

Source: Secondary Data

The results showed that the characteristics of outpatients did not show a significant relationship to direct medical costs (p> 0.05) (Table 1). The characteristics of the patient's age, length of stay, and treatment class showed a significant relationship to the direct medical costs of hospitalization (p<0.05) (Table 2). The length of stay of ischemic stroke patients at this hospital was mainly about 5-10 days (69.47%). The results of Firmansyah's research (2016) stated that the average treatment time was 6.5 ± 6.1 days. According to Pinzon and

Asanti (2010), the length of treatment for ischemic stroke is between 7-10 days. The average length of stay of stroke patients in the USA in 2009 was 5.3 days; in France in 2009 was 6.4 days [9]. Hadning's study (2015) concluded that length of stay was not influenced by age, gender, education and employment but wasaffected by the severity of the stroke suffered. A study in China reported that the length of stroke treatment was influenced by the severity of the disease[10], where the number of accompanying comorbid factors could be an indication of the severity of the patient's disease, fibrillation, stroke type, stroke therapy, relapse, and patients aged 65 years or older [11].

A total of 43 ischemic stroke patients were treated in class I in this study, while the number of ischemic stroke patients in class II and class III were 18 and 38, respectively.

The discrepancy between INA-CBG's rates compared to the real costs of ischemic stroke outpatients

Table 3 displays the results of the discrepancy between the INA-CBG's rates compared to the real costs of outpatients showing that the INA-CBG's rates are lower than the average real costs. This indicated that the hospital's real cost of outpatient treatment was less than the INA-CBG's rates. The INA-CBG's rates for outpatient ischemic stroke patients at type B hospitals were lower than the average real cost for minor chronic diseases. Code Q-5-44-0 indicated other minor chronic diseases. Furthermore, based on the nominal amount of rupiah, a negative difference of Rp. 193,404,900 was obtained (the result of the difference in INA-CBG's rates minus the real cost) with an average of Rp. 84,199. This illustrated that INA-CBG's rates determined for ischemic stroke outpatient in type B hospitals might not be sufficient to payfor all the patient's treatment needs.As a result, the hospital must pay the difference in costs. However, there was no significant difference between the real costs of outpatient ischemic stroke therapy at type B hospitals and INA-CBG's rates in 351 patients $(p = 0.673)$.

Table 3.The discrepancies between INA-CBG's rates compared to the real costs ofischemic stroke outpatients (n= 99)

INA-CBG's Coding	N (number of visits)	Real cost		INA-CBG's rates		Differences		SD	p
		Total (Rp)	Mean (Rp)	Total (Rp)	Mean (Rp)	Total (Rp)	Mean (Rp)		
Q-5-44-0	743	157.474.000	211.943	141.417.000	190.332	-16.057.000	- 21.611	77.371	0,053

Source: Secondary Data

Table 4 shows that INA-CBG's rates were higher than the average real cost for ischemic stroke inpatients. It indicated that the real cost of hospitalization was sufficient to pay for patient care except for stroke hospitalization in mild cases. Stroke is an "expensive" disease because stroke sufferers often require further treatment and long-term rehabilitation. Studying the cost of stroke patients is essential to support public health policymakers in developing stroke management strategies [12]. The health care system is very closely related to the cost of health services. An analysis of the costs of health services in hospitals is also needed to provide information about the total expenses incurred in hospitals and sources of financing and its components.

The Indonesian government organizes the National Health Insurance (JKN) program through BPJS to provide health protection for participants to obtain health care benefits and security in meeting primary health needs. In the implementation of the National Health Insurance (JKN), the pattern of payments to advanced health facilities has been regulated by INA-CBG following Presidential Regulation Number 12 of 2013 concerning Health Insurance as amended by Presidential Regulation Number 111 of 2013 [13].

Table 4. The discrepancies between INA-CBG's rates compared to the real costs of inpatient ischemic stroke patients (n=99)

No	INA-CBG's Coding	N (number of visits)	Real Cost (Rp) Total	Real Cost (Rp) SD	INA-CBG's rates (Rp) Total	INA-CBG's rates (Rp) SD	Differences (Rp)	SD	p
			Total	**SD**	**Total**	**SD**			
				Class I (n=43)					
1	G-4-14-I	14	82.835.000	1.838.473	72.223.200	0	-10.611.800	1.838.473	1,000
2	G-4-14-II	23	172.248.300	2.684.097	214.567.000	0	42.318.700	2.684.097	0,001
3	G-4-14-III	6	69.792.200	6.270.437	69.991.800	0	199.600	6.270.437	0,180
	Sub Total		324.875.500		356.782.000		31.906.500		
				Class II (n=18)					
4	G-4-14-I	6	31.091.500	1.431.467	26.530.800	0	-4.560.700	1.431.467	0,394
5	G-4-14-II	10	66.093.000	2.642.192	79.963.000	0	13.870.000	2.642.192	0,023
6	G-4-14-III	2	21.103.800	3.614.164	19.997.600	0	-1.106.200	3.614.164	1,000
	Sub Total		118.288.300		126.491.400		8.203.100		
				Kelas III (n=38)					
7	G-4-14-I	11	42.822.500	545.423	40.533.900	0	-2.288.600	545.423	0,010
8	G-4-14-II	23	130.572.100	2.225.681	153.262.800	0	22.690.700	2.225.681	0,015
9	G-4-14-III	4	20.425.200	2.004.976	33.329.600	0	12.904.400	2.004.976	0,029
	Sub Total		193.819.800		227.126.300		33.306.500		
	Total		636.983.600		710.399.700		73.416.100		

Source: Secondary Data

The INA-CBG's rates is a package rate that includes all components of hospital resources used in both medical and non-medical services. The method of paying for patient care is based on a diagnosis or case that is relatively the same. In making payments using the INA-CBG's system, the hospital and the paying party no longer break down bills based on the details of the services provided but only by conveying the patient's discharge diagnosis and procedures. The INA-CBG's code for inpatient non-hemorrhagic stroke is G-4-14 13.

According to the Regulation of the Minister of Health Number 59 of 2014 concerning Standard Health Service Tariffs in the Implementation of the Health Insurance Program, hemorrhagic stroke is grouped into the INA-CBG's system based on treatment class and severity level divided into three diagnosis code groups, namely G-4-14-I, G-4-14-I, and G-4-14-III with the last digit of the Roman numeral code INA-CBG's as an indicator of the severity of the disease.

Based on the Minister of Health of the Republic of Indonesia number 71 of 2013 concerning health services at the National Health Insurance (JKN) states that the difference or difference in the costs of BPJS outpatient and inpatient health care class III, II and I are the responsibility or burden of the hospital as a provider of health services. The magnitude of the cost difference is obtained from reducing the total INA-CBG's rate with the total real cost of ischemic stroke patients.

Calculating and analysing disease costs based on INA-CBG's rates are necessary to see that the rates determined for JKN patients based on the grouping system are in accordance with the real costs incurred by the hospital as a health service provider for disease treatment. The amount of the INA-CBG's rate set by the government is different for each diagnosis code, both primary and secondary, the severity of the disease, and the right to inpatient class that the patient receives. Based on these factors, the INA-CBG's coding is determined, which has the primary diagnosis of ischemic stroke, namely G-4-14 for infarcted blood vessel injury. Based on the coding, it can be differentiated based on the severity level, namely the mild, moderate and severe severity. This division of severity will determine the size of the patient's INA-CBG's rates; the higher the severity level, the higher the costs incurred by the JKN insurance.[1]

IV.   CONCLUSION

The characteristics of the subjects showed that the majority of patients in this study were men (69.7%), aged > 70 years (40.4%), comorbid with > 1 comorbid (71.7%), length of stay 5 – 10 days (70.7%), Class I of care (43.4%). The results showed that the characteristics of outpatients did not show a significant relationship to direct medical costs. The characteristics of the patient's age, length of stay, and a class of treatment showed a significant relationship to the direct medical costs of hospitalization. The results of the discrepancy between INA-CBG's rates compared to the real costs of outpatients show that the INA-CBG's rates are lower than the average real costs. This showed that this hospital's real cost of outpatient treatment was less than the INA-CBG's rates. Otherwise, the INA-CBG's rates for inpatient care were higher than the average real cost. This shows that the real cost of hospitalization was sufficient to pay for patient care except for stroke hospitalization in mild cases. The results of this study can be used as a consideration in determining health policy, health insurance and pharmacoeconomic data sources.

V.   ACKNOWLEDGEMENTS

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