COST-EFFECTIVENESS ANALYSIS OF GASTRITIS TREATMENT FOR INPATIENT PATIENTS IN SUMEDANG REGENCY HOSPITAL

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diserahkan 05/05/2023, diterima 07/08/2023

ABSTRAK

Gastritis merupakan penyakit yang terjadi akibat peradangan di lambung. Gastritis merupakan salah satu penyakit yang banyak terjadi di Indonesia, termasuk di RSUD Sumedang. Terapi pengobatan yang digunakan pada penyakit gastritis yaitu proton pump inhibitor (PPI), antagonis reseptor H2, dan antasida. Pemberian terapi pengobatan yang digunakan oleh pasien berdampak pada besarnya biaya pengobatan. Penelitian ini bertujuan untuk menganalisis nilai cost-effectiveness antara penggunaan omeprazole dan lansoprazole pada pasien gastritis rawat inap di RSUD Kabupaten Sumedang. Penelitian ini menggunakan Metode Cost-Effectiveness Analysis dengan rancangan pengambilan data secara retrospektif pada periode Oktober 2020 – Oktober 2021. Data yang diambil meliputi Usia pasien, jenis kelamin, biaya pengobatan, biaya perawatan, biaya laboratorium dan durasi rawat inap pasien. Nilai efektivitas pada penelitian ini diukur dalam lamanya durasi pengobatan.

Kata Kunci : Gastritis, Analisis Efektivitas Biaya, Omeprazole, Lansoprazole.

ABSTRACT

Gastritis is a disease caused by inflammation in the stomach. Gastritis is one of the most common diseases in Indonesia, including in Sumedang Hospital. Treatment used in gastritis patients usually consists of H2 receptor antagonists, proton pump inhibitors (PPIs), and antacids. Administration and selection of therapy in the treatment of gastritis given to patients has an impact on the amount of treatment costs. This study aims to analyze the value of cost-effectiveness between the use of omeprazole and lansoprazole in hospitalized gastritis patients at the Sumedang District General Hospital. This study used the Cost-Effectiveness Analysis Method with a retrospective data collection design for the period October 2020 – October 2021. The data collected included patient age, gender, medical costs, treatment costs, laboratory costs and duration of patient hospitalization. The effectiveness value in this study was measured in the length of treatment duration.

Keywords: Gastritis, Cost-Effectiveness Analysis, Omeprazole, Lansoprazole.

INTRODUCTION

Gastritis is a condition in which the mucous lining of the stomach or the mucosa that protects the stomach wall from stomach acid is damaged. Damage to this layer can be caused by the habit of drinking alcoholic beverages, smoking habits and can also be caused by bacteria Helicobacter pylori, as well as the effects of using non-steroidal anti-inflammatory drugs (NSAIDs) or steroids so that inflammation occurs which causes abdominal pain, indigestion (dyspepsia), bloating and nausea (Clevel and Clinic,2021).

According to a report from the World Health Organization (WHO), gastritis is a significant public health issue, occurring in both developed and developing countries, with around 1.8-2.1 million cases recorded annually. In populations in developing countries, the percentage of cases of gastritis is higher, reaching 50.8%, while developed countries have a smaller percentage, namely 34.7% (Evelyn et al,2018; Marcis et al.,2018; Nuari,NA,2021). The incidence rate of gastritis in men tends to be higher than women. In Indonesia, WHO reports the incidence rate of gastritis reaches 40.8%, with some areas having a high prevalence. As many as 274,396 gastritis cases were recorded from a population of 238,452,952 people in Indonesia, or about 4.9% of the total gastritis cases in the country. This condition causes gastritis to become one of the most common diseases in patients who are hospitalized in Indonesia (Marcis et al.,2018; Saladin,2018).

Treatment regimens given to gastritis patients vary. To relieve symptoms, gastritis is usually treated with neutralizing and acid-lowering drugs, depending on the type and severity of symptoms such as antacids which act to neutralize acid in the stomach. Meanwhile, histamine 2 (H2) inhibitors or proton pump inhibitors (PPI) can reduce acid production (NHS,2021). For cases of gastritis caused by gastritis bacteria H. pylori, the drug regimen given is a PPI combined with antibiotics. Whereas for autoimmune metaplastic atrophic gastritis, vitamin supplements are given, and immunomodulatory therapy in autoimmune enteropathic gastritis, to dietary modifications in eosinophilic gastritis (Yang., et al,2014). For the therapeutic regimen in hospital patients that is used based on survey data, the drug regimen used to treat gastritis patients is a PPI class of drugs, namely omeprazole, and lansoprazole.

Due to a large number of choices of these therapeutic regimens, it is necessary to carry out pharmacoeconomic studies to identify and select drugs that are rational and provide maximum effectiveness at low prices so that drugs with these criteria can become recommendations or the main choice of therapy because they have the highest level of benefits. The pharmacoeconomic study considers clinical factors (effectiveness) as well as economic factors (cost). The methodology that can be used in making decisions in choosing therapy recommendations in terms of benefits and costs is Cost Effectiveness Analysis (Cost-Effectiveness Analysis). Cost-Effectiveness Analysis or CEA is an economic analysis technique for comparing costs and results (outcomes) relative of two or more health interventions. The CEA method may be used when the effect of an intervention can be expressed in terms of one main measurable outcome in natural units, such as an increase in cholesterol levels (Republic of Indonesia Ministry of Health. 2013).

Therefore, based on the explanation above, an analysis of therapy selection for gastritis in the general hospital of Sumedang region needs to be conducted. This research is necessary because according to the Health Department Profile of Sumedang Regency, gastritis has an incidence rate

of 9%. The results of this study are also expected to assist in therapy selection for managing gastritis based on Pharmacoeconomic Analysis.

METHOD

This research was conducted at the Sumedang Regional General Hospital in January 2021–November 2021. This research has received permission and approval from the Unpad Faculty of Pharmacy and the Sumedang District Hospital. The design used in this research is done in a way descriptive research with retrospective data collection that compares direct medical cost (direct medical expenses) of omeprazole or lansoprazole in hospitalized gastritis patients at Sumedang Hospital.

The population used in this study are all patients with gastritis symptoms who were hospitalized using omeprazole or lansoprazole at Sumedang Hospital. The samples used in this study are inpatients with symptoms of gastritis at Sumedang Hospital in the period January - November 2021. Samples must meet the inclusion and exclusion criteria. Inclusion criteria included, gastritis patients aged more than 18 years and gastritis patients receiving omeprazole or lansoprazole therapy. Whereas the exclusion criteria are gastritis patients who died or with co-morbidities and forced to go home, medical records were incomplete, illegible and lost.

Data analysis was carried out in the form of tables and descriptively. After the required data has been collected, it is checked and then calculated. The calculation of direct medical costs consists of three components, namely medical costs, maintenance costs, and laboratory costs for each patient. Then it is calculated according to the use of each patient's drug, then the average is calculated. Data were grouped into group A (omeprazole therapy) and group B (lansoprazole therapy). Then do the calculations ACER of the data using the following formula (Republic of Indonesia Ministry of Health. 2013).

$$ACER = \frac{Cost}{Effectiveness}$$

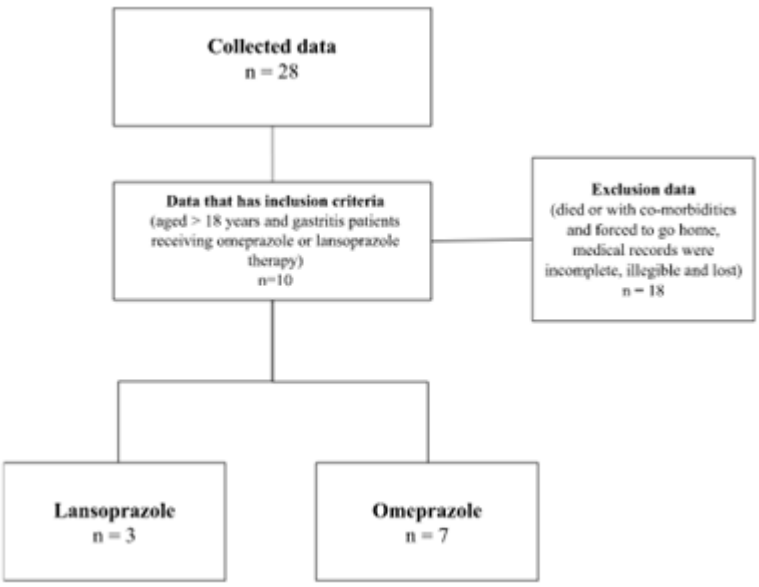

Figure 1. Patient data collection based on inclusion and exclusion criteria

Information:
Cost : Average cost of therapy
Effectiveness : Average outcome drug therapy

The results of the Cost-Effectiveness Analysis can be summed up with ICER (Incremental Cost-Effectiveness Ratio) as the formula below:

$$ICER = \frac{\Delta Cost}{\Delta Effectiveness} = \frac{Cost\ A - Cost\ B}{Effectiveness\ A - Effectiveness\ B}$$

Information:
Cost A : The average cost of omeprazole
Cost B : The average cost of lansoprazole
Effect A: Effectiveness of omeprazole
Effect B: Effectiveness of lansoprazole

RESULTS AND DISCUSSION

Based on the results of research that was carried out in the Fund Mobilization section of the hospital and Medical Record Installation at the Sumedang District General Hospital, data were found on 28 patients diagnosed with gastritis symptoms in the period January-November 2021. From medical record data, the number of patients diagnosed with symptoms of gastritis without comorbidities and received omeprazole and lansoprazole therapy met the inclusion criteria of 10 medical records.

Age Characteristics Data

Based on the data in table 1, it was found that patients of reproductive age are more susceptible to gastritis because busy activities lead to unhealthy lifestyles, such as frequent stress, irregular meal times, and consuming too much spicy and sour food. Poor eating patterns in productive age also often occur because they want drastic weight loss, this also greatly influences the cause of gastritis (Notoatmodjo S. 2010).

Gender characteristic data

In Table II, data was obtained that 80% of the patients were female and 20% male. Gastritis is more common in women because psychologically women are prone to stress. It is also stated that women use feelings and emotions more so that they are easy or prone to experiencing psychological stress. Psychological stress greatly affects gastritis because it irritates the gastric mucosa which results in stomach acid production increase (Gupta,2008).

Table I. Characteristic data based on the age of gastritis patients at Sumedang district

Age	Number of Patients (n)	Percentage (%)
18 - 35	4	40%
36 - 55	4	40%
≥ 56	2	20%
Total	10	100%

Table II. Characteristic data based on the sex of gastritis patients in District Hospital Sumedang

Gender	Number of Patients (n)	Percentage (%)
Man	2	20%
Woman	8	80%
Total	10	100%

Comorbidities

Comorbidity is a term used in the field of health to describe additional medical conditions that a person has alongside the main diagnosed or treated medical condition. This term is often used in the context of chronic diseases or long-term health conditions.

For example, if someone is diagnosed with gastritis and, at the same time, also has high blood pressure (hypertension), then hypertension will be considered a comorbidity because the condition coexists alongside gastritis.

Comorbidities can impact the management and prognosis of a person's health condition since some medical conditions can influence and worsen the course of other diseases. Therefore, it is important for healthcare professionals to pay attention to and manage comorbidities appropriately when caring for patients (Listina, et al, 2021).

In this study, the data used involved patients without comorbidities, as including comorbid conditions in the criteria could potentially lead to differences in cost calculations.

Cost Effectiveness Analysis

From medical record data, the number of gastritis patients who used omeprazole was 7 patients with an average length of stay of 2.625 days. While the number of gastritis patients who used the drug lansoprazole was 3 patients with an average length of stay of patients who were said to be able to go home, namely 2.333 days.

Calculation of direct medical costs for gastritis patients undergoing hospitalization at the Based on Sumedang (Table III and Table IV), there are 3 cost components, namely maintenance costs, medical costs, and laboratory test costs.

Treatment costs consist of consultation fees, expert staff, nursing, and accommodation room costs. Medical expenses include the cost of drugs, medical devices, and bmhp. Laboratory test costs are costs incurred by patients including laboratory test costs and Radiology test costs

Table III and table IV show Total Direct Medical Cost and Direct medical cost per patient. Total direct medical cost use of Omeprazole for the 7th patient, which is Rp. 12,692,409 with a direct medical cost per patient of Rp.1.813.201. While total direct medical cost the use of Lansoprazole for the three patients is Rp5.315.896 with a direct medical cost per patient of Rp1.771.965.

The objective of the cost-effectiveness analysis assessment uses the method ACER is to compare the total cost of a program divided by clinical expenditure to produce a ratio that represents the cost per specific clinical outcome. With this method, it is possible to choose an alternative lower cost of treatment. Based on Calculations ACER that have been carried out (Table V), it was found that omeprazole was more cost-effective compared to lansoprazole because it has value ACER the lower one is Rp690.743.

Table VI shows values ICER Rp. 141,219. Method Use ICER intended to determine the cost required to achieve one additional unit of outcome. When one alternative is more effective but requires more resources then ICER must be calculated. The relationship between the ICER (Incremental Cost-Effectiveness Ratio) value and the mentioned parameters can vary and is often influenced by factors such as the magnitude of cost and effectiveness differences, the nature of the treated disease or condition, the time horizon of the analysis, and the perspective of the analysis (e.g., societal or healthcare payer perspective). In summary, the relationship between the ICER value and the parameters is not always linear. The ICER value provides a useful metric to assess the cost-effectiveness of healthcare interventions,

Table III. Sample direct medical cost data using omeprazole therapy at District Hospital Sumedang period January–November 2021

No	Patient Name	Cost Component (Rp)			Total (IDR)
		Medical Expenses (Rp)	Treatment Fee (Rp)	Laboratory Cost (Rp)	
1	SN	308.091	1.258.350	105.000	1.671.441
2	IS	447.477	1.179.900	142.500	1.769.877
3	SW	233.549	877.200	77.500	1.188.249
4	O	565.826	1.970.100	105.000	2.640.926
5	YS	246.797	1.052.259	142.500	1.441.556
6	LS	659.365	1.654.091	87.500	2.400.956
7	IN	341.504	1.055.400	182.500	1.579.404
		Total Direct Medical Cost			12.692.409
		Direct medical cost per patient			1.813.201

Table IV. Sample direct medical cost data using lansoprazole therapy at RSUD Kab. Sumedang period January–November 2021

No	Patient Name	Cost Component (Rp)			Total (IDR)
		Medical Expenses (Rp)	Treatment Fee (Rp)	Laboratory Cost (Rp)	
1	OF	373.916	1.515.400	290.000	2.179.316
2	IN	219.645	1.035.200	182.500	1.437.345
3	NS	127.500	1.267.700	304.035	1.699.235
		Total Direct Medical Cost			5.315.896
		Direct Medical Cost per Patient			1.771.965

Table V. Calculation ACER use of omeprazole and lansoprazole in Gastritis patients at RSUD Kab. Sumedang period January–December 2021

PPI drugs	Average direct medical cost (C) (Rp)	Effectiveness (E) (days)	ACER (C/E)
Omeprazole	1.813.201	2,625	690.743
Lansoprazole	1.771.965	2,333	759.522

Table VI. Calculation ICER use of omeprazole and lansoprazole in Gastritis patients at RSUD Kab. Sumedang period January–December 2021

PPI drugs	Average direct medical cost (C) (Rp)	Effectiveness (E) (days)	C	E	ICER (ΔC/ΔE)
Omeprazole	1.813.201	2,625	41.236	0,292	141.219
Lansoprazole	1.771.965	2,333			

but the interpretation of ICER requires careful consideration of the specific context and assumptions of the pharmacoeconomic analysis being conducted. Based on value ICER obtained, changing omeprazole therapy to lansoprazole therapy can save costs of Rp. 141,219.

CONCLUSION

From the results of the research conducted, it was concluded that by calculating ACER, more omeprazole therapy was obtained cost-effective at a cost of Rp 690,743. However, after recalculating using the ICER method, it was found that lansoprazole therapy was more cost-effective because it can save costs of Rp 141,219.

ACKNOWLEDGEMENT

We, as the authors, would like to express our deepest gratitude to the lecturer in the Pharmacoeconomics course, Faculty of Pharmacy, Padjadjaran University for allowing us to conduct this research. We also express our deepest gratitude to the RSUD Kab. Sumedang for providing data and allowing us to carry out this research to completion. Hopefully, this research can be useful.

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