

Omeprazole vs. Lansoprazole: Effectiveness in gastroesophageal reflux disease patients at a Jambi Referral Hospital

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Abstract

Background: Omeprazole and lansoprazole, both proton pump inhibitors (PPIs), are widely used to manage gastroesophageal reflux disease (GERD) with comparable outcomes. However, lansoprazole may provide faster symptom relief. This study aimed to compare the clinical effectiveness of omeprazole and lansoprazole in GERD patients.

Method: This observational retrospective cohort study included hospitalized GERD patients at Raden Mattaher Regional Hospital, Jambi, from 2022 to 2024. A total of 117 patients were selected using consecutive sampling. Data were obtained from medical records and analyzed using SPSS version 25.

Results: Most patients were aged 40-59 years (42.7%), female (55.6%), unemployed (55.8%), high school (51.7%), National Health Insurance (93.2%), non-erosive GERD (91.1%), no comorbidities (56.4%), normal BMI (84.2%), average vital signs included blood pressure (130.0 mmHg), pulse (88.0 x/minute), respiration rate (20.0 x/minute), body temperature (36.4°C). The clinical outcome showed negative endoscopic findings (91.1%), length of stay ≤ 7 days (80.3%) median 5 days. There were no statistically significant differences in clinical improvement between omeprazole and lansoprazole nor type of drug, length of stay, age, gender, grade, occupation or comorbidities ($p > 0.05$).

Conclusions: The analysis showed no statistically significant difference in clinical outcomes between omeprazole and lansoprazole, indicating comparable effectiveness of both proton pump inhibitors in the improvement of GERD symptoms.

Keywords: Effectiveness; Gastroesophageal Reflux Disease; Lansoprazole; Omeprazole.

INTRODUCTION

The prevalence of GERD symptoms increases by approximately 4% annually, reaching 27.4% in Indonesia, and approximately 10-15% of adolescents experience GERD. GERD can disrupt quality of life and potentially lead to long-term health complications if left untreated. The main symptoms of GERD include regurgitation (the backflow of stomach contents into the esophagus and mouth, often accompanied by a sour or bitter taste) and heartburn (a burning sensation in the chest that radiates toward the neck) (1).

The global prevalence of GERD among adults is approximately 13%. Around 10–20% of adults in the United

States experience GERD symptoms at least once a week, according to population-based studies. The most common occurrences of GERD symptoms are found in South Asia and Southeastern Europe, with prevalence rates exceeding 25% (1). In East Asia, the prevalence ranged between 5.2% and 8.5% in 2005 and 2010. In Indonesia, the prevalence of GERD continues to rise and remains relatively high. In 2016, 22.8% of GERD cases in Jakarta were diagnosed through endoscopy (2). According to a study by Syam et al. (2016), the prevalence of GERD in Indonesia is 27.4% (3). Recent research supported by the Ministry of Health indicates that approximately 10–

15% of Indonesian adolescents experience GERD. (4). Meanwhile, the prevalence of proton pump inhibitor (PPI) use has also increased over time. In Indonesia, PPI therapy is administered to approximately 40–70% of hospitalized patients (5).

Table 1. Sociodemographic characteristics of GERD Patients

Characteristics	n (%)
Age (years),	
Median (min-max), n (117)	51.0 (18.0-81.0)
18-39 years	35 (29.9)
40-59 years	50 (42.7)
≥ 60 years	32 (27.4)
Sex, n (117)	
Male	52 (44.4)
Female	65 (55.6)
Occupation, n (104)	
Employed	46 (44.2)
Unemployed	58 (55.8)
Education, n (58)	
Elementary School	11 (19.0)
Junior High School	3 (5.2)
Senior High School	30 (51.7)
Bachelor's Degree	14 (24.1)
Health Insurance, n (117)	
NHI	109 (93.2)
Non-NHI	8 (6.8)

The increasing prevalence of GERD is influenced by various risk factors. Lifestyle changes such as smoking, obesity, poor dietary habits, coffee consumption, and stress contribute to the rising incidence of GERD, which can disrupt daily activities and reduce quality of life (6). Additionally, GERD symptoms can be exacerbated by certain medications and dietary supplements, such as those that interfere with the function of the lower esophageal sphincter—including antidepressants, calcium channel blockers, and narcotics. Long-term use of certain nonsteroidal anti-inflammatory drugs (NSAIDs) and antibiotics can also worsen the condition (7). Poor medication adherence is one of the contributing factors to increased morbidity in Indonesia. Low adherence to treatment can negatively impact disease control, increase the risk of

complications, raise healthcare costs, and heighten the likelihood of hospitalization (8).

Table 2. Clinical characteristics of GERD Patients

Characteristics	n (%)
Grade, n (79)	
Non-Erosive	72 (91.1)
Grade A	6 (7.6)
Grade B	1 (1.3)
Comorbidity, n (117)	
Yes	51 (43.6)
No	66 (56.4)
BMI (kg/m²),	
Median (min-max), n (76)	22.2 (14.7-32.9)
Underweight (<18.5 kg/m ²)	7 (9.2)
Normal (18.5-24.9 kg/m ²)	56 (73.7)
Overweight (25-29.9 kg/m ²)	12 (15.8)
Obesity (≥30 kg/m ²)	1 (1.3)
Initial Blood Pressure (mmHg),	
Median (min-max), n (117)	130.0 (76.0-207.0)
Normal	32 (27.4)
Abnormal	85 (72.6)
Initial Pulse Rate (beats/min),	
Median (min-max), n (117)	88.0 (64.0-122.0)
Normal	95 (81.2)
Abnormal	22 (18.8)
Initial Respiratory Rate (breaths/min),	
Median (min-max), n (117)	20.0 (18.0-30.0)
Normal	62 (53.0)
Abnormal	55 (47.0)
Initial Temperature (°C),	
Median (min-max), n (117)	36.4 (36.0-38.2)
Normal	116 (99.1)
Abnormal	1 (0.9)
Endoscopic, n (79)	
Positive (+)	7 (8.9)
Negative (-)	72 (91.1)
Length of Stay,	
Median (min-max), n (117)	5.0 (1.0-11.0)
≤ 7 days	94 (80.3)
> 7 days	23 (19.7)

Based on these considerations, the researchers aimed to identify the characteristics of GERD patients at Raden Mattaher General Hospital, Jambi.

METHOD

This study is an observational study with a retrospective cohort design, utilizing medical record data from 117 patients obtained through a consecutive sampling technique. The population taken was all GERD patients who received omeprazole and lansoprazole therapy. The sample consisted of GERD inpatients at Raden Mattaaher General Hospital from 2022 to 2024 who met the inclusion criteria, namely: (1) patients diagnosed with Gastroesophageal Reflux Disease (GERD) and hospitalized at Raden Mattaaher General Hospital, (2) patients who received

proton pump inhibitor (PPI) therapy in the form of omeprazole or lansoprazole, and (3) patients aged over 18 years. while the exclusion criteria are: (1) Patient died, (2) Patient was forced to go home, (3) Incomplete medical record data.

RESULTS

Based on the retrospective study of GERD patients at Raden Mattaaher Regional Hospital from 2022-2024, the characteristics of the patients as seen in table 1. The clinical characteristics of GERD patients as seen in table 2.

Table 3. Clinical effectiveness of omeprazole and lansoprazole in GERD Patients

Variable	Clinical Improvement		Total n (%)	P-value	RR (CI 95%)
	Improved n (%)	Not Improved n (%)			
Type of Medicine					
Omeprazole	96 (96.0)	4 (4.0)	100 (100.0)	1.000	0.960
Lansoprazole	17 (100.0)	0 (0.0)	17 (100.0)		(0.922-0.999)
Length of Stay					
≤ 7 days	91 (96.8)	3 (3.2)	94 (100.0)	1.000	1.012
> 7 days	22 (95.7)	1 (4.3)	23 (100.0)		(0.921-1.112)
Age					
< 60 years	82 (96.5)	3 (3.5)	85 (100.0)	1.000	0.996
≥ 60 years	31 (96.9)	1 (3.1)	32 (100.0)		(0.924-1.073)
Gender					
Male	50 (96.2)	2 (3.8)	52 (100.0)	1.000	0.992
Female	63 (96.9)	2 (3.1)	65 (100.0)		(0.925-1.063)
Grade					
Erosiva	7 (100.0)	0 (0.0)	7 (100.0)	1.000	1.043
Non-erosiva	69 (95.8)	3 (4.2)	72 (100.0)		(0.994-1.095)
Comorbidity					
Yes	48 (94.1)	3 (5.9)	51 (100.0)	0.316	0.956
No	65 (98.5)	1 (1.5)	66 (100.0)		(0.887-1.030)
BMI					
Normal	53 (94.6)	3 (5.4)	56 (100.0)	0.562	0.946
Abnormal	20 (100.0)	0 (0.0)	20 (100.0)		(0.889-1.007)
Occupation					
Employed	45 (97.8)	1 (2.2)	46 (100.0)	1.000	1.013
Unemployed	56 (96.6)	2 (3.4)	58 (100.0)		(0.949-1.081)
Education					
< High School	14 (100.0)	0 (0.0)	14 (100.0)	-	-
≥ High School	44 (100.0)	0 (0.0)	44 (100.0)		

DISCUSSIONS

Based on Table 1, the majority of GERD patients at Raden Mattaaher General

Hospital were aged 40–59 years, totaling 50 individuals (42.7%). According to Lu et al. (2022), GERD is more commonly found among individuals aged 40-60 years (9). This finding is consistent with the study by Rahman et al. (2018), which reported that the most affected age group was 41-60 years (10). Similarly, a study conducted by Karina et al. (2016) stated that most GERD cases occurred in individuals over 40 years old. This may be due to the fact that people in this age range are typically in their productive years, during which busy work schedules and daily activities can lead to unhealthy lifestyles and stress factors known to increase the risk of GERD. In addition, physiological changes in the esophagus that occur with advancing age may also contribute to the higher incidence of GERD (11).

The majority of GERD patients were female based on gender distribution, totalling 65 individuals (55.6%). This finding is consistent with the study by Royani et al. (2024), which reported that most GERD patients were women (12). Similarly, a study conducted by Febriyani et al. (2025) also found that the majority of GERD patients were female. Several explanations suggest that women have a higher risk of developing GERD due to hormonal factors. This is because the hormones estrogen and progesterone, which are predominant in women, play an important role in relaxing smooth muscles, thereby reducing lower esophageal sphincter (LES) pressure (13).

About 58 patients (55.8%) were unemployed, consisting mostly of housewives, students, and job seekers. This finding is consistent with the study by Rijal et al. (2024), which reported that the majority of GERD patients were housewives (31.4%). Several factors contribute to the increased risk of GERD among housewives, one of which is stress. Stress can increase resting pressure in the lower esophageal sphincter (LES), inhibit its relaxation, and impair acid clearance from the esophagus (14). Furthermore, according to the study by Sakti and Mustika (2022), factors influencing the occurrence of GERD among university students include dietary habits such as

skipping meals, consuming high-fat or spicy foods, drinking coffee, and lying down immediately after eating. These habits can trigger an increase in gastric hydrochloric acid production, which, when combined with elevated intra-abdominal pressure or changes in body position, may cause acid reflux and lead to heartburn symptoms associated with GERD (15).

In terms of educational level, most GERD patients had completed senior high school, totaling 30 individuals (51.7%). According to a study by Abdullah et al. (2016), patients with an educational level of senior high school or below have a higher risk of developing GERD due to limited knowledge and lifestyle-related factors (16). Furthermore, the theory proposed by Febriyani et al. (2025) states that GERD is more common among individuals with lower educational backgrounds. This may be attributed to a lack of knowledge, as education significantly influences a person's level of understanding. The higher one's educational level, the better their knowledge tends to be including awareness and understanding of diseases such as GERD (13).

Most GERD patients were covered by NHI health insurance, totaling 109 individuals (97.3%). RSUD Raden Mattaher serves as a provincial referral hospital. According to Widada et al. (2017), NHI provides a mechanism that enhances public accessibility to healthcare services (17). Moreover, health insurance helps reduce the financial burden of healthcare costs that would otherwise have to be borne by individuals (17).

Based on the grade of GERD patients, most were diagnosed with non-erosive reflux disease (NERD), totaling 72 individuals (91.1%). Bestari (2011) stated that compared to Western countries, the prevalence of GERD in the Asia-Pacific region tends to be milder, with normal endoscopic findings, indicating NERD; 90% of patients with esophagitis were classified as grade A or B (17). This finding is also consistent with the National Consensus on the Management of GERD in Indonesia (2022), which states that the most common type of GERD is non-

erosive reflux disease (NERD), accounting for 60-70% of cases. The prevalence of NERD in the Asia-Pacific region is estimated to range from 78-93% among GERD patients. The prevalence of erosive reflux disease in the Asia-Pacific region is still dominated by the Los Angeles (LA) classification grade A (50-90%) or mild degree (18).

Comorbidity in GERD patients were dominated by those without comorbid conditions, totaling 66 individuals (56.4%). Meanwhile, the group of patients with comorbidities consisted of 50 individuals (43.1%). This indicates that GERD does not always occur alongside other diseases, although the presence of comorbidities can influence the patient's clinical symptoms. According to a study conducted by Filho et al. (2009), the most common comorbidities found in GERD patients include hypertension, diabetes mellitus, hypercholesterolemia, asthma, depression, obesity, and constipation. The presence of these comorbidities can worsen the quality of life of GERD patients (19).

Regarding Body Mass Index (BMI), the majority of patients were in the normal category, totaling 56 individuals (73.7%). This finding is consistent with the study by Vaishnav et al. (2017), which reported that most GERD patients had a normal BMI (62.5%); however, in overweight and obese patients, esophageal erosions were more frequently observed through upper gastrointestinal endoscopy (19). Similarly, a study conducted by Hidayati et al. (2022) found that the majority of GERD patients had a normal BMI (47.4%). Nonetheless, medications, dietary habits, smoking, obesity, and pregnancy are recognized risk factors for GERD. The accumulation of fat in abdominal adipose tissue increases intra-abdominal pressure in obese individuals. This elevated pressure stretches the lower esophageal sphincter (LES), allowing gastric acid to reflux into the esophagus. Additionally, unhealthy eating patterns can reduce LES pressure, enabling gastric contents to flow back into the esophagus (20).

The initial vital signs of GERD patients showed an average blood pressure of 130.0

mmHg, an average pulse rate of 88.0 beats per minute, an average respiratory rate of 20.0 breaths per minute, and an average body temperature of 36.4 °C. Blood pressure in the abnormal category included both hypertension and hypotension. In adults, normal blood pressure is defined as <120/80 mmHg (21). According to Sulistyowati (2018), normal blood pressure ranges from 90–120 mmHg systolic and 60-80 mmHg diastolic, a normal pulse rate is 60-100 beats per minute, a normal respiratory rate is 12-20 breaths per minute, and normal body temperature is 36-37.5 °C (21). The results of this study indicate that the vital signs of GERD patients were generally within the normal range, although some patients showed elevated vital signs. This finding is consistent with a study by Wu et al. (2024), which found that GERD is associated with increased systolic and diastolic blood pressure, as well as a higher risk of hypertension and myocardial infarction. Therefore, stabilization of vital signs following PPI therapy not only reflects clinical improvement but also contributes to the prevention of long-term cardiovascular complications. The presence of alarm symptoms such as dysphagia, hematemesis, or weight loss should be carefully monitored, as these conditions may be associated with changes in vital signs, including tachycardia, hypotension, or increased respiratory rate due to bleeding or pain (22).

Based on endoscopic findings, the majority of patients showed negative results (-), totaling 72 individuals (91.1%). In this study, a negative result indicates the absence of lesions observed during endoscopic examination. A total of 79 patients underwent endoscopy, while 38 patients did not. According to Bestari (2011), the prevalence of GERD in the Asia-Pacific region tends to be milder compared to Western countries, with endoscopic results often appearing normal, categorized as non-erosive reflux disease (NERD). When esophagitis is present, 90% of cases fall within grade A or grade B classifications (23).

Based on the length of hospital stay, the majority of patients were hospitalized for ≤7 days, totaling 94 individuals (80.3%). Pratiwi

and Azzahra (2022) mentioned that hospitalization for less than seven days had the highest percentage (82%), in which most patients experienced clinical improvement within <7 days of hospitalization (24). Furthermore, according to a study conducted by Patala et al. (2021), the number of GERD patients who underwent inpatient care for 1-7 days was the highest, with 65 patients (90.28%). This indicates that the GERD therapy provided to patients was in accordance with their symptoms and diagnostic results, resulting in faster symptom improvement and a reduced length of hospital stay (7).

The bivariate analysis as seen in table 3 show that among GERD inpatients at Raden Mattaher General Hospital, nearly all patients experienced clinical improvement regardless of the type of medication used. The p-value shows $p = 1.000$; $RR = 0.960$ (0.922–0.999), indicating that there is no statistically significant difference between the type of medication and clinical improvement. This suggests that omeprazole and lansoprazole are relatively similar in improving clinical symptoms. A previous study by Putri et al. (2018) also stated that there was no significant difference in effectiveness between omeprazole and lansoprazole in reducing the RSI (Reflux Symptom Index) score (25). This may be due to several factors, such as diet, medication adherence, and lifestyle modification. Lifestyle modification can be a significant factor influencing therapeutic response. This highlights the important role of behavioral changes and patient education in promoting clinical outcomes (26).

Patients with a length of stay of more than 7 days were mostly those with comorbidities such as diabetes mellitus, hypertension, hepatitis, CAD, CKD, bronchitis, and asthma. The p-value was 1.000 ; $RR = 1.012$ (0.921–1.112), indicating that there was no statistically significant difference between the length of stay and clinical improvement of patients. This suggests that the GERD therapy provided to patients was appropriate to their symptoms and diagnostic findings, resulting in faster

improvement of symptoms or complaints and reducing the need for prolonged hospitalization (7). Differences in the length of hospital stay may be influenced by other factors such as psychosocial factors, nutritional status, comorbidities, disease severity, and advanced age (27).

In the age group, the p-value was 1.000 ; $RR = 0.996$ (0.924–1.073), indicating that there was no statistically significant difference between age and clinical improvement of patients. A study conducted by Abdullah et al. (2016) stated that there was no significant difference between age and GERD (16). However, according to Patala et al. (2021), physiological changes in the esophagus occur with increasing age, such as decreased bicarbonate saliva production, which increases acid reflux exposure in the esophagus due to slower acid clearance. This leads to reduced LES relaxation length and esophageal motility disorders, with a higher proportion of abnormal peristalsis and slower acid reflux clearance in the esophagus. The high incidence of GERD occurs in the productive age group, particularly above 40 years, as various occupational and daily activities may lead to unhealthy lifestyles and stress, thereby increasing the risk of GERD (7).

Furthermore, for gender the p-value was 1.000 ; $RR = 0.992$ (0.925–1.063), where $p > 0.05$, indicating that there was no significant difference between gender and clinical improvement of patients. This is consistent with a study conducted by Sakti and Mustika (2022), which found that gender was not associated with the incidence of GERD (15). Conversely, a study by Ndraha et al. (2016) reported that male patients (22 subjects, 88.5%) had a sevenfold higher success rate in GERD therapy compared to female patients. The success of single PPI therapy in males showed better outcomes than in females. The reason women are more prone to GERD may be related to female hormones. The female body produces estrogen and progesterone, and one of the functions of these hormones is to relax muscles in the body, including those in the digestive tract (28).

For the patient grade, the p-value was 1.000; RR = 1.043 (0.994–1.095), where $p > 0.05$, indicating that there was no statistically significant difference between the severity level and clinical improvement of patients. This is consistent with the study by Isshi et al. (2021), which found no significant difference in symptom severity among NERD, mild ERD (grade A/B), and severe ERD (grade C/D) groups. However, the severe ERD (grade C/D) group showed the best response to PPI therapy within 2-4 weeks compared to NERD or mild ERD (29).

Based on comorbidities, the p-value was 0.316; RR = 0.956 (0.887–1.030), where $p > 0.05$, indicating that there was no statistically significant difference between comorbid diseases and clinical improvement in GERD patients. However, a study conducted by Siagian and Girsang (2022) found a significant relationship between comorbidities and the incidence of GERD ($0.007 < 0.05$), suggesting that other diseases a person suffers from can create differences in the risk of developing GERD. This is usually caused by a decline in physical condition and poorly maintained dietary patterns (30).

Body mass index (BMI), the p-value was 0.562; RR = 0.946 (0.889–1.007), where $p > 0.05$, indicating that there was no statistically significant difference between BMI and clinical improvement in patients. This is consistent with a study conducted by Purthana and Somayana (2020), which found no significant relationship between overweight BMI and gastroesophageal reflux disease, either statistically or clinically. BMI is a measurement tool that uses height and weight to determine a person's nutritional status, making it easy and inexpensive to measure. However, BMI cannot differentiate between fat mass and muscle mass, so it cannot specifically determine whether a person is obese or not (31).

Based on occupation, the p-value was 1.000; RR = 1.013 (0.949–1.081), where $p > 0.05$, indicating that there was no statistically significant difference between occupation and clinical improvement in GERD patients. This finding is consistent with a study conducted by Abdullah et al. (2016), which reported no

relationship between occupation and the incidence of GERD, where most subjects were housewives and married women who tended to have scheduled meal times, reducing the risk of GERD (16). Additionally, a study by Alsuwat et al. (2018) in Saudi Arabia stated that there was no significant relationship between occupation and GERD, possibly because there was no increase in working hours, whereas overtime or extended work hours could increase the incidence of GERD (32).

For the patients' highest level of education, the p-value and RR could not be determined because all patients experienced clinical improvement. In this study, there were limitations in the data used, namely an insufficient sample size at the hospital, an unbalanced or disproportionate distribution of patients with the majority using omeprazole compared to lansoprazole and some patient characteristic data not recorded in the medical records. These factors could therefore have influenced the study results.

CONCLUSIONS

The sociodemographic profile of hospitalized GERD patients at Raden Mattaher Regional General Hospital was predominantly middle-aged (40–59 years), female, unemployed, and covered by National Health Insurance, with most having completed senior high school education. Clinically, the majority presented with non-erosive reflux disease (NERD), normal BMI, no comorbidities, and stable vital signs. Most patients showed negative endoscopic findings and a short hospitalization period (≤ 7 days). There was no statistically significant difference in clinical improvement between omeprazole and lansoprazole across all evaluated variables, including drug type, length of stay, age, sex, disease grade, comorbidities, BMI, occupation, and education ($p > 0.05$). These findings suggest that omeprazole and lansoprazole have comparable effectiveness in improving the clinical outcomes of GERD inpatients.

The recommendation for practitioners is that omeprazole and lansoprazole can be used interchangeably in hospitalized patients

with GERD, with drug selection guided by availability, cost considerations, patient tolerance, and institutional formulary, rather than by perceived differences in clinical effectiveness.

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