



Evaluation of Medication Use in Patients with Gastroesophageal Reflux Disease (GERD) in the Inpatient Unit at a Hospital in Cimahi

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ABSTRACT

Gastroesophageal Reflux Disease (GERD) is a pathological condition characterized by the regurgitation of gastric contents into the esophagus, resulting in symptoms affecting both the esophagus and extra-esophageal regions. The aim of this study is to ascertain the usage pattern and rationality of GERD medication consumption. This study utilizes an observational approach with a descriptive cross-sectional design. The data collection was performed retrospectively by examining the treatment histories of GERD patients documented in the medical records at the Inpatient Installation of Dustira Hospital from January to June 2023. The sample comprised 200 persons who met the inclusion criteria. Research indicated that individuals with GERD were predominantly female, comprising 73.5%, while males constituted approximately 26.5%. The predominant age range was 18-45 years, comprising 63.5%, followed by 46-59 years at 23.5%. 61 patients received a combination of omeprazole and sucralfate as the predominant medication. The analysis showed that 100% of patients utilized the medication with the appropriate indication, 97.5% with accurate drug selection, 100% with precise dosage, 100% with the right method of administration, and 100% with the appropriate administration interval.

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1. Introduction

Evaluating drug utilization patterns is essential for patient care, as it measures the quality of treatment administered to patients (Enato & Chima, 2011). The evaluation of treatment rationale ensures its effectiveness, safety, and appropriateness. Irrational prescribing will elevate the incidence of pharmacological adverse effects, drug interactions, treatment expenses, and lead to diminished patient adherence to medicine. Irrationality may also impact the patient's physiology, as excessive administration of medications, regardless of indication or dosage, might jeopardize organ function. Evaluating drug utilization patterns is crucial for patient care, as it gauges the effectiveness of the treatments given to patients (Destiani et al., 2016; Enato & Chima, 2011).

Gastroesophageal reflux disease (GERD) is a chronic gastrointestinal condition characterized by the regurgitation of gastric contents into the esophagus the esophagus, oropharynx, and/or respiratory

tract due to abnormal reflux, causing disturbing symptoms and/or complications (Perkumpulan Gastroenterologi Indonesia, 2022; Shaqran et al., 2023). Patients may experience symptoms that involve heartburn, a burning sensation in the chest; regurgitation, a sensation of stomach contents moving upward; chest discomfort; dental erosions; persistent cough; asthma; and laryngitis. (Shaqran et al., 2023; Syam et al., 2016). GERD symptoms impact the quality of life, especially when they occur at night, including decreased productivity, sleep disturbances, increased anxiety, and high medical costs (Perkumpulan Gastroenterologi Indonesia, 2022).

Gastroesophageal reflux disease (GERD) has become among the most prevalent gastrointestinal (GI) diagnoses in patients (Eusebi et al., 2017; Kamangar et al., 2020; Kazakova et al., 2023; Peery et al., 2020). Data indicates that the largest frequency of GERD occurs in Central America (19.6%), whereas the lowest is observed in Asia (10.0%), particularly in Southeast Asian nations (7.4%) (Eusebi et al., 2017; Kamangar et al., 2020). Gastroenterological illnesses tend to pose major health problems in Indonesia (Simadibrata & Adiwinata, 2017). The incidence of gastroesophageal reflux disease (GERD) in Indonesia has risen recently; a research from Cipto Mangunkusumo National Referral Hospital reported an increase from 5.7% in 1997 to 25.18% in 2002 (Simadibrata & Adiwinata, 2017). Age over 50 years old, obesity (BMI > 30 kg/m²), and smoking habit were the risk factors of GERD in Indonesian medical doctors (Syam et al., 2016). Existing research related to the prevalence of GERD around Cimahi was conducted by Suherman et al. (2021) which stated that the highest prevalence was in women at 53.66%, and the highest prevalence based on age was in the 26-35 year age group at 29.26% (Suherman et al., 2021). Based on data on increasing prevalence in Jakarta, therefore, a new study is needed on the prevalence of GERD in Jakarta to evaluate whether there is an increase or not.

Research into drug usage patterns in West Java have been carried out in Hospital in Karawang Friyanto et al., (2002) and Hospital in Bandung Suherman et al., (2021). The study Friyanto et al., (2002) identified 68 GERD patients at RSUD Karawang, with a predominance of female patients at 51.5%. The research revealed an average of 64% correct dosage, 59.3% correct medication, 80.4% correct indication, and 89.7% correct patient identification. The administration of medication in GERD patients in Cimahi was judicious, with a 100% rate of appropriate drug use, 97.56% for correct dosage, 97.56% for correct timing, and 100% for the correct method of administration (Suherman et al. (2021)).

Based on the description from the background, which indicates that a study on the rationality of drug use in hospitalized GERD patients at Dustira Hospital in Cimahi is important to conduct periodically. There are not many studies in Indonesia that discuss the use of medication in GERD patients based on the level of rationality. This research aims to analyze the profile and rationale of drug utilization among GERD patients at a hospital in Cimahi

2. Methods

This research is a descriptive observational study using a cross-sectional design with a retrospective methodology. We collected retrospective data by examining the medical records of hospitalized patients diagnosed with gastroesophageal reflux disease (GERD) at the Inpatient Unit of Hospital TK.II 03.05.01 Dustira Cimahi from January to June 2003, provided they met the inclusion criteria. The study's inclusion criteria encompassed individuals aged over 18, of both genders, diagnosed with non-esophagitis GERD, with or without accompanied conditions, and in possession of comprehensive and clear medical records. The exclusion criteria included patients with diseases other than GERD and those missing complete and clear medical records. The assessment of the rationality of drug use refers to the guidelines of the Indonesian Ministry of Health (Kementerian Kesehatan RI, 2011), with drug information (indications, dosage, and frequency of administration) adjusted according to the British National Formulary 73rd edition, 2017 (BNF, 2017) and National Consensus on the Management of Gastroesophageal Reflux Disease in Indonesia (Perkumpulan Gastroenterologi Indonesia, 2022). The analysis focuses on variables such as patient gender, age, medication type and classification, and the appropriateness of medication usage, which includes the correct medication, dosage, administration

interval, and route of administration. The Research and Ethics Committee of Dustira Hospital has granted permission for the study under reference number RSD/014/III/2024. No. RSD/014/III/2024.

3. Results and Discussion

This study used a descriptive observational study using a cross-sectional design with a retrospective methodology. Cross-sectional studies have been thought to be effective for estimating the prevalence of an illness, hence the name "prevalence studies". They can, however, also assess the relationship between two or more variables, indicating that they are analytical in nature. This is an appealing option for exploring associations in advance or in settings with restricted resources (Cvetkovic-Vega et al., 2021). Retrospective data acquisition was implemented. The fundamental advantage of retrospective data is that it allows for the study of large samples and is useful for evaluating unusual events at a cheap cost. The disadvantage of this strategy is that there is little control over the data collection process, which means that key variables may be absent and the data is untrustworthy (Alarkawi et al., 2018). On the other hand, a spillover impact is anticipated based on the retrospective data collected. Spillover effects are the potential for us to communicate with prescribers in order to alert them to the care of future patients (Hennesy et al., 2003)

A total number of 200 patients records from inpatients unit were used for assessment of drug evaluation patterns for patients with GERD. Prevalence of Gastroesophageal Reflux Disease (GERD) the patient data in this study is categorized into three age groups: 18-45 years, 46-59 years, and 60 years and above. The research findings indicate that most GERD patients range within the 18-45 age demographic. Table 1 displays the distribution of GERD patients by age. Gastroesophageal reflux disease (GERD) predominantly affects individuals aged 18 to 45 years. The risk of GERD will increase with various work commitments and other activities that have a high potential to cause an unhealthy lifestyle and stress. Therefore, the incidence rate of GERD is most commonly found in the productive age group (Patala et al., 2021; Setiawan et al., 2021; Yamasaki et al., 2018). The incidence of GERD is rising among the productive-age population due to multifactorial factors (Yamasaki et al., 2018). Lifestyle choices can significantly influence the development of GERD. The American College of Gastroenterology (ACG) identifies several lifestyle habits that may contribute to GERD, including eating immediately before sleep, reclining right after meals, consuming food rapidly, and ingesting trigger foods such as those high in fat, chocolate, and caffeine (Setiawan et al., 2021).

Table 1. Demographic characteristics of GERD patients

Characteristics	Number Of Patients (n=200)	%
Age		
18 - 45	127	63,5
46- 59	47	23,5
>60	26	13
Gender		
Male	53	26,5
Female	147	73,5

Based on gender, female patients suffering from GERD with or without comorbidities numbered 147 (73.5%), while male patients suffering from GERD with or without comorbidities numbered 53 (26.5%). From this data, it can be concluded that women are more likely to experience GERD. This research is in line with other research at hospitals in Bandung and Serang (West Java, Indonesia) which states that the highest prevalence of GERD is in female patients. (10.36423/pharmacoscript.v4i2.713, 10.37311/jsscr.v6i1.24847). Yamasaki dkk., (2018) described that GERD patients were consistently slightly higher in females than males. There is no significant difference

between patients' gender (Yamasaki et al., 2018). A study by Kim dkk., (2019), indicated a considerably greater frequency of GERD in males; however, GERD symptoms were more prevalent in females.

Table 2. Analysis of Rational Drugs Uses

Drugs	Freq	Accuracy (%)			
		Selection	Dosage	Interval	Indication
Monotherapy					
Omeprazole	47	100	100	100	100
Ranitidine	2	100	100	100	100
Pantoprazole	3	100	100	100	100
Esomeprazole	1	100	100	100	100
Combination 2 drugs					
Omeprazole + Sucralfat	62	100	100	100	100
Lansoprazole +Sucralfate	8	100	100	100	100
Pantoprazol + Sucralfate	8	100	100	100	100
Omeprazol + Domperidone	11	100	100	100	100
Lansoprazole+Metaklopramide	1	100	100	100	100
Pantoprazole + Domperidone	2	100	100	100	100
Lansoprazole +Domperidone	1	100	100	100	100
Esomerpazole +Domperidone	1	100	100	100	100
Omeprazole + Ranitidin	1	100	100	100	100
Ranitidin + Sucralfate	2	100	100	100	100
Combination 3 drugs					
Omeprazole+Domperidone+Sucralfate	25	100	100	100	100
Lansoprazole+Domperidone+Sucralfate	3	100	100	100	100
Lansoprazole+Pantoprazole+Domperidone	1	100	100	100	100
Pantoprazole+Domperidone+Sucralfate	1	100	100	100	100
Pantoprazole+Lansoprazole+Sucralfate	3	100	100	100	100
Pantoprazole+Metaclopramide+Sucralfate	2	100	100	100	100
Pantoprazole+Lansoprazole+Sucralfate	3	100	100	100	100
Esomeprazole+Domperidone+Sucralfate	1	100	100	100	100
Ranitidine+Sucralfate+Domperidone	3	100	100	100	100
Omeprazole+Ranitidine+Sucralfate	3	0	100	100	100
Combination 4 drugs					
Lansoprazole + Sucralfate + Domperidone Metaklopramide	2	100	100	100	100
Combination 5 drugs					
Pantoprazole + Sucralfat + + Ranitidine + Antasida+Domperidone	1	0	100	100	100
Omeprazole + Domperidone + Sucralfate + Ranitidine + Antasida	1	0	100	100	100

In table 2, PPI was the most commonly used in single use among 52 patients, consisting of Omeprazole used in 48 patients, Pantoprazole used in 3 patients, and Esomeprazole used in 1 patient. In the combinations of two medications, omeprazole was the most prevalent, utilised by 74 patients, followed by lansoprazole and pantoprazole, each used by 10 individuals, but the combination of ranitidine with sucralfate was administered to 2 patients. Among the three-drug combinations, omeprazole was the most prevalent, used by 25 patients, whereas in the four-drug combination, lansoprazole was the predominant medication. Proton pump inhibitors (PPIs) reduce gastric acid secretion and are among the most frequently employed acid-suppressing pharmaceuticals globally. PPI is the first-line therapy for GERD (Perkumpulan Gastroenterologi Indonesia, 2022). Omeprazole was the most frequently administered proton pump inhibitor (Guruge dkk., 2023), although the current study demonstrates that the treatment of reflux esophagitis with esomeprazole, lansoprazole, pantoprazole, and rabeprazole is more cost-effective than omeprazole during an 8-week period. (Plumb dan Edwards,

2002). Esomeprazole is the first choice for GERD because esomeprazole is more effective than other PPI drugs (Perkumpulan Gastroenterologi Indonesia, 2022). Esomeprazole is the second most popular PPI (Guruge dkk., 2023).

The study demonstrates the precision of indications in the management of Gastroesophageal Reflux Disease (GERD) within the Inpatient Unit of Hospital TK.II 03.05.01. In Dustira, the indications were already completely accurate (100%). The diagnosis code for GERD at Dustira Hospital is K21.9. When the administered drug matches the patient's documented diagnosis in the medical records, the indication is considered accurate (Kementerian Kesehatan RI, 2011). The diagnosis of GERD is characterized by particular symptoms, namely heartburn and/or regurgitation that manifest postprandially (Perkumpulan Gastroenterologi Indonesia, 2022). Issuing prescriptions without explicit indications or requisite criteria may result in the dispensation of medications that are incongruent with the symptoms and diagnosis, potentially leading to adverse effects on patients. Consequently, suitable indications are essential for the rational use of medicines (Pratiwi dkk., 2014).

At the Inpatient unit of TK.II 03.05.01 Dustira Hospital, the analysis of medicine selection suitability for patients with Gastroesophageal Reflux Disease (GERD) revealed that this disease affected 195 patients (98.5%). Within the cohort of patients diagnosed with gastroesophageal reflux disease (GERD) at the Inpatient Installation of Dustira Hospital, 5 patients (2.5%) utilized combination medications incorrectly. Forty-seven patients utilized omeprazole, a proton pump inhibitor (PPI), as their predominant monotherapy medicine. In table 2, PPI was the most commonly used in single use among 52 patients, consisting of Omeprazole used in 48 patients. Proton pump inhibitors (PPIs) reduce gastric acid secretion and are among the most frequently employed acid-suppressing pharmaceuticals globally. PPI is the first-line therapy for GERD (Perkumpulan Gastroenterologi Indonesia, 2022). PPI is the most effective drug in eradicating symptoms and Of all the recovering esophagitis lesion in GERD has been proven providing more rapid recovery on esophagitis lesion as well as eradicating GERD symptoms compared to the H₂ receptor antagonists and prokinetics. If PPI is not available, H₂RA can be administered (Perkumpulan Gastroenterologi Indonesia, 2022). Omeprazole was the most frequently administered proton pump inhibitor (Guruge et al., 2023), although the current study demonstrates that the treatment of reflux esophagitis with esomeprazole, lansoprazole, pantoprazole, and rabeprazole is more cost-effective than omeprazole during an 8-week period (Plumb dan Edwards, 2002). Esomeprazole is the first choice for GERD because esomeprazole is more effective than other PPI drugs. (Perkumpulan Gastroenterologi Indonesia, 2022). Esomeprazole is the second most popular PP (Guruge et al., 2023). The predominant medicine combination for Gastroesophageal Reflux Disease (GERD) is Omeprazole and Sucralfate, utilized by 61 individuals. Administering mucosal-protective agents alongside PPI therapy may expedite the healing of ulcers induced by ESD. (Nishizawa et al., 2015). The combined action of these two medications may enhance efficacy, expediting recovery relative to monotherapy (DiPiro et al., 2020). Combination therapy can provide a recovery rate of 80–90% for peptic ulcers in the elderly. Combination therapy in geriatric peptic ulcer patients can reduce the incidence of ulcer complications. (Santika et al., 2019). Cytoprotective medicines safeguard the gastric mucosa from excessive gastric acid, while proton pump inhibitors (PPIs) diminish the activity of the hydrogen-potassium adenosine triphosphatase enzyme. Sucralfate contributes to the enhancement of bicarbonate synthesis, therefore reducing recurrence (Rahman et al., 2018). The most commonly used combination of 3 drugs for gastroesophageal reflux disease (GERD) is the combination of omeprazole, domperidone, and sucralfate, with 25 patients. The PPI group works by reducing acid production in the stomach and thereby preventing the erosion of the stomach lining. Meanwhile, sucralfate will coat the inflamed area, which can accelerate healing. Domperidone is a prokinetic group that increases esophageal and stomach motility. Thus, it can shorten the gastric emptying rate, increase the pressure on the lower esophageal sphincter, and reduce the symptoms of vomiting and regurgitation (Rahman et al., 2018). Two patients utilized a combination of four medications—metoclopramide, lansoprazole, domperidone, and sucralfate—as an antiemetic for gastroesophageal reflux disease (GERD). One patient utilized a combination of five medications for gastroesophageal reflux disease (GERD): domperidone, sucralfate, pantoprazole, ranitidine, and an antacid. Combination therapy, like H₂

receptor antagonists with sucralfate or H₂ receptor antagonists with proton pump inhibitors, is not recommended because it may make treatment more expensive without improving how well it works (DiPiro et al., 2020; Santika et al., 2019).

The evaluation of dosage accuracy in patients diagnosed with gastro-oesophageal reflux disease (GERD) at the Inpatient Unit Dustira Hospital revealed that the dosage was entirely accurate, involving 200 patients (100%). The dosage of PPI medicine adheres to the National Consensus on the Management of Gastro-oesophageal Reflux Disease in Indonesia (Perkumpulan Gastroenterologi Indonesia, 2022). The treatment is deemed appropriate if the dosage of the peptic ulcer medication conforms to the guidelines set by the British National Formulary 73 (BNF, 2017). Subtherapeutic dosages may lead to insufficient drug concentrations in the bloodstream, culminating in an inadequate reaction and failure to attain the intended therapeutic effect. Dosing inaccuracies may arise from an inadequate dose that is not suitable (Santika et al., 2019).

The analysis results indicate that the administered dosage of sucralfate was 3x1 g/day. The recommended dosage of sucralfate is 4 grams per day, administered as 1 gram four times daily (BNF, 2017). The data indicated a dosage modification of 3x1 gr/day, as the therapy administered to the patient with gastro-oesophageal reflux disease (GERD) was a combined therapy, rendering 3x1 gr adequate daily throughout the treatment duration (Vermeijden et al., 1992). The dose of omeprazole to the hospitalised patients in this case is 40 mg every 24 hours, consistent with the guideline dosage for GERD, which ranges from 20 to 40 mg every 24 hours (BNF, 2017; Perkumpulan Gastroenterologi Indonesia, 2022) The predominant length for omeprazole was 4 weeks (32 arms), with a range spanning from 10 days to 8 weeks. In one treatment, omeprazole was administered for 4 weeks for duodenal ulcers and 6 weeks for stomach ulcers (Vg et al., 2024).

The research shows that the analyze of appropriate administration route for patients with Gastroesophageal Reflux Disease (GERD) at the inpatient unit of Dustira Hospital is 100% effective. The severity of the patient's illness modifies the routes of drug administration, whether oral or intravenous. Oral delivery results in systemic effects as the medication circulates throughout the body's bloodstream, whereas intravenous treatment can cause both systemic and localized effects. The appropriate administration method must align with safety factors and the patient's condition. Consequently, the formulation at the time of administration, the dosage, and the administration route will significantly impact the medication's therapeutic efficacy. (Kementerian Kesehatan RI, 2011).

The assessment of the precision of medicine administration intervals for patients with Gastroesophageal reflux disease (GERD) at the Inpatient Unit of Dustira Hospital reveals that 200 patients received their medications at the appropriate intervals, with 100% compliance. The literature recommends administering sucralfate every 6 hours, or 4 times a day, at a dosage of 1 gram per day (BNF, 2017)... The study found that the daily dosage of sucralfate was 3 grams. The study shows that a dose of 4 grammes of sucralfate per day was suggested for people with gastro-oesophageal reflux disease (GERD). However, the dose was changed to 3x1 gr/day, which was enough for each day of the treatment (Vermeijden et al., 1992). The specified time interval is 8 hours daily. We should assess the specified time interval based on the maximum administered dosage to ensure that the administration frequency does not exceed the maximum daily dosage. The administration interval can modify The administration interval can modify based on the severity of the patient's condition (BNF, 2017).

4. Conclusion

The study shows an increase in the prevalence of GERD in women account for 73.5% of cases of GERD, while men account for approximately 26.5%. The predominant age group is 18 to 45 years, at 63.5%, followed by the 46 to 59 years group at 23.5%. 61 patients received a combination of two pharmaceuticals, specifically omeprazole and sucralfate, as the predominant treatment. The analysis of rational drug use shows 100% accuracy in indication, 97.5% accuracy in drug selection, and 100% accuracy in dosage, mode of administration, and administration interval. It can be concluded that the treatment carried out on inpatients is still in accordance with existing management, but further research is needed

regarding drug usage patterns among outpatients with GERD at Dustira Hospital's, emphasizing treatment duration and pharmaceutical efficacy. In addition, based on data on increasing prevalence in women, further research is needed in other hospitals to see changes in prevalence and/or treatment management.

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