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Original Research Paper

Gastroenterology

EVALUATING THE APPREHENSIONS ABOUT THE EXCESSIVE UTILIZATION OF ANTI-SECRETORY MEDICATION CONSUMPTION

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ABSTRACT

Prescription usage research studies are valuable instruments for assessing prescription prescribing patterns and the efficacy of hospital formularies. The use of gastroprotective medications has been increasing significantly, and several research on drug utilization have shown excessive use of proton pump inhibitors (PPIs) in various centers, particularly in industrialized nations. The purpose of this study is to ascertain and pinpoint these issues. ***Methods:*** A six-month prospective observational medication use study was undertaken on inpatients in a tertiary care hospital to assess the use of gastroprotective drugs. The case records of the patients were examined to assess the prescription of gastroprotective medications and relevant data was collected. The Validated Frequency Scale for the Symptoms of GERD Questionnaire (FSSG), consisting of 12 questions related to gastrointestinal symptoms, was utilized to measure the symptoms score and evaluate the efficacy of anti-ulcer medications in patients with gastrointestinal symptoms. ***Result:*** Pantoprazole was administered in the majority of instances, accounting for 68.5%, followed by Ranitidine at 31.5%. The prevalence of polypharmacy was substantial, with an average of 6.35 medicines per prescription. Just 36% of the prescriptions provided a sufficient justification for the use of these medications. 33% of the patients experienced gastrointestinal symptoms with an FSSG score more than 8, whereas the average overall FSSG score for all patients was 6.35. The simultaneous use of antimicrobials and NSAIDs was prevalent. NSAIDs were incorrectly administered in 90% of patients, whereas antibacterial medicines were wrongly prescribed in 53.5% of patients. There were 21 prescriptions that have the potential for medication interaction. ***Conclusion:*** Hospital practice still frequently involves the improper utilization of PPI. The potential hazards linked to prolonged usage of PPIs, such as hindrance of vitamin B absorption, heightened susceptibility to super-infections, and higher risk of osteoporosis, should be weighed against the advantages.

KEYWORDS : Anti-secretory Medications, Proton pump inhibitors, H2 blockers, Drug utilization

INTRODUCTION

Drug utilization research studies conducted in the inpatient settings are effective tools that help in evaluating the drug prescribing trends, efficiency of hospital formularies[1].

Drug utilization refers to the patterns, extent, and purpose of drug use within a population or a specific group over a defined period. It involves the analysis of various aspects of drug consumption, including the frequency, dosage, duration, and route of administration. The study of drug utilization is essential for understanding how medications are prescribed, dispensed, and consumed in real-world settings[2]

Key components of drug utilization research include:

Prescribing Patterns: Examining how healthcare providers prescribe medications, including the choice of drugs, dosage, and frequency.

Dispensing Practices: Investigating how pharmacists provide medications to patients, ensuring that the prescribed drugs are available and accurately dispensed.

Patient Adherence: Assessing how well patients follow the prescribed regimen, including factors that may influence their adherence to medication.

Drug Expenditure: Analyzing the economic aspects of drug use, including costs incurred by both individuals and healthcare systems.

Safety and Efficacy: Evaluating the outcomes and side effects associated with drug use, with a focus on patient safety and the effectiveness of treatments.

Health Outcomes: Studying the impact of drug utilization on health outcomes, such as disease management, quality of life, and overall patient well-being.

Comparative Effectiveness: Comparing different drugs or treatment strategies to identify the most effective and efficient options for specific conditions[3].

Gastroprotective medicines are a class of medications that effectively reduce and sustainably decrease the production of stomach acid. 25% of prescriptions in the outpatient and inpatient departments include an anti-secretory medication[4]. The advent of potent acid-suppressing medications, such as H2 antagonists, Proton Pump Inhibitors, Cytoprotective medicines, and Prostaglandin Analogues, has drastically transformed the treatment of acid-related upper gastrointestinal issues[5]. These treatments have been expanded for use in treating additional disorders and symptoms, including as non-ulcer dyspepsia, heartburn, and preventing adverse effects caused by other medications[6]. There is now a growing concern about the imprudent use of several medications on a global scale. Notable examples include Antimicrobials, Corticosteroids, Analgesics, Antacids, Acid lowering drugs, vitamins, and the utilization of several illogical pharmacological combinations[7].

Undoubtedly, there is a prevalent tendency to excessively utilize anti-secretory pharmaceuticals, which is seen in all medical fields, especially among practitioners who frequently administer antiplatelet agents, non-steroidal anti-inflammatory drugs (NSAIDs), steroids, and anticoagulant treatments[8].

There are already worries about the possibility of negative consequences occurring as a result of prolonged acid suppression. The prevalent side effects associated with H2 blockers encompass headache, dizziness, diarrhea, tiredness, and disorientation.PPIs are correlated with several

negative outcomes that are mechanistically connected to hypochlorhydria, such as clostridium difficile-associated diarrhea, community-acquired pneumonia, bone fracture, vitamin B12 deficiency, and antiplatelet interactions. Several recent studies have indicated a correlation between the use of PPIs and the development of dementia and renal failure[9].

Despite the aforementioned problems of anti-secretory treatments, they have been widely prescribed medications globally. A recent study conducted in a hospital setting found that 63% of the patients were prescribed proton pump inhibitors (PPIs) without a legitimate medical reason, leading to a substantial rise in healthcare costs[10].

The importance of rational drug use can be explained by the definition provided by the World Health Organization (WHO). According to the WHO, rational drug use entails ensuring that patients receive medications that are suitable for their clinical needs, in doses that meet their individual requirements, for a sufficient duration, and at the lowest possible cost to both the patients and their community[11].

MATERIALS AND METHODS

This study was a prospective observational study on medication utilization done from July 19, 2010 to January 2011 in a tertiary care institution, after approval from the Institutional Ethics Committee. The study was done over a duration of six months, with a sample size of 200. The research comprised patients over 18 years old who were admitted to the tertiary care hospital and provided anti-secretory medicines, after obtaining their written informed permission. Information was gathered using the case report sheet, and patients were questioned using the FSSG questionnaire on the initial day of admission and again after a seven-day follow-up period.

The severity of gastrointestinal symptoms was evaluated using the Frequency Scale for the Symptoms of GERD (FSSG) questionnaire. This questionnaire is designed specifically for GERD and consists of 12 questions. There are seven questions to assess the severity of reflux and five questions to evaluate dysmotility. A FSSG score more than 8 was deemed important for stomach symptoms.The user's text is incomplete and does not provide any information[12].

QUANTITATIVE ANALYSIS

The results were presented as a percentage, and the utilization of anti-peptic ulcer drugs was assessed based on the current recommendations and guidelines.

RESULTS

In our analysis, we discovered that out of a total of 200 prescriptions, 104 were for males while the remaining prescriptions were for girls. Among the age range of 18-39 years, the biggest number of prescriptions (106 out of 200) were for anti-secretory drugs. Additionally, 75% of the patients had a varied diet. [Table 1].

Table 1: Characteristics Of The Study Population (n=200)

Age group	No. of Patients
18-39	106
40-64	72
65 and above	22
Sex	
Male	104
Female	96
Diet	
Vegetarian	51
Mix	149

The greatest indications for the use of anti-secretory medications were found to be in combination with NSAIDs and antimicrobials. These indications were followed by antimicrobials alone, NSAIDs alone, acute gastritis, and GERD. [Table 2].

Table 2: Indication For Using Antisecretory Drugs

Indications	No of patients
Acute gastritis	5
GERD	2
With NSAIDS	21
With antimicrobials	39
With anti-microbials+NSAIDS	106
Other	25

The FSSG scores shown significant changes in the before and post assessments across all departments. The average pre-FSSG score was shown to be 6.35, but the post-score reduced to 1.87. [Table 3].

Table 3: Pre And Post Intervention FSSG Score In Patients (50 patients/ward)

Frequency scale for the Symptoms of GERD Questionnaire						
Ward	Reflux Score		Dysmotility Score		Total Score	
	Pre	Post	Pre	Post	Pre	Post
Ortho	1.56	0.34	1.12	0.4	2.68	0.74
Sur	2.92	0.51	3.02	1.06	5.94	1.57
Gynac	1.32	0.6	1.88	1	3.2	1.62
Med	6.74	1.58	6.84	2	13.58	3.58
Avg	3.13	0.75	3.21	1.11	6.35	1.87

Of the total 200 prescriptions, only 36% (72 prescriptions) were found to have linked risk factors. The most prevalent risk factor identified for the use of Anti-secretory medication in conjunction with NSAIDs was an FSSG score over 8. [Table 4].

Table 4: Risk Factors For Using Anti-secretory With NSAIDs

No	Risk factors for using Anti-secretory drugs with NSAIDs	No. of patients
1	Age>65	17
2	Present GI SYM (FSSG>8)	45
3	Diagnosed GERD/Gastritis	7
4	Concomitant steroids/anticoagulant/antiplatelet	3

The indications were classified as Adequate Documented Indications and uncertain/NO documented indications. Only 36% of the prescriptions had established indications, such as being for those over the age of 65 or for those experiencing signs of acid peptic illness. There is a lack of documented reasons in 64% of cases for the use of NSAIDs in patients who are not at risk, as well as for the use of antimicrobials, NSAIDs with antimicrobials, and other treatments. [Table 5].

Table 5: Rating Of Indications And Results Of Use Of Gastro-protective Agents

Indications	Prescriptions (n=200)	Total%
Adequate documented indications		
NSAIDs/ Aspirin in high risk patients	20	72(36%)
Acid peptic disease symptoms	52	
Uncertain/ No documented indications		
NSAIDS in no risk	12	
Antimicrobials	18	128(64%)
NSAIDs with Antimicrobials	89	
Others	9	

Out of a total of 70 prescriptions, drug-drug interactions were expected in 70 of them. The largest incidence of drug-drug interactions was seen between Vitamin B12 and gastroprotective drugs, as evidenced by 40 prescriptions. This was followed by interactions between calcium and antacid preparations. Additionally, we noted a significant prevalence

of polypharmacy, with an average of 6.5 medicines per prescription out of a total of 200 pharmaceuticals across 40 prescriptions. The prescription had a total of 7 medications, which is the maximum number of pills per prescription.

Table 6: Anticipated Drug-drug Interactions With Anti-secretory Drugs

Anticipated drug-drug interactions	No. of prescriptions
Antacids+PPI	8
Antacid+H2 blocker	1
PPI+sucralfate	2
Vit B12+Gastro-protective agent	40
Calcium+Gastro-protective agent	12
Aspirin/Clopidogrel+H2 blocker/PPI	7

DISCUSSION

In India, the most often given medications are proton pump inhibitors[13]. We have found comparable outcomes. The current study reveals that, among the chosen patients, 65% of the prescriptions during their hospitalization were for PPI, while ranitidine accounted for 30.5%. The findings are consistent with a previous study conducted by Ramirez et al., which indicated that the utilization of PPIs ranged from 28.65% to 82.65%. Additionally, Sandozi T observed a PPI usage rate of 45% among hospitalized patients[14].

Pantoprazole was the predominant medication prescribed in the surgery, medicine, and orthopaedics ward, accounting for 127 out of 150 prescriptions. Out of the total prescriptions, Ranitidine was predominantly prescribed in the Gynaecology department, accounting for 47 out of 50 cases. Ranitidine is a widely recognized medication that has a superior safety record when used during pregnancy.This might perhaps explain the increased utilization of ranitidine in the gynecology ward. Previous research conducted by Mayet and Nousheen et al. indicated that the utilization of PPI was higher in males compared to females. This study yielded similar results.

PPIs have demonstrated a high level of safety and tolerability, with little short-term negative effects. This might be attributed to the over application of PPIs in recent years. However, several indications fall beyond the parameters set by the existing prescription recommendations.The CDSCO publication National Formulary of India-2011 provides guidelines for the use of PPIs in various medical conditions, including benign gastric and duodenal ulcers, Zollinger-Ellison syndrome, gastric acid reduction during surgery, GERD, NSAIDs-induced ulcers, prophylaxis during NSAID treatment in high-risk patients for peptic ulceration, preoperative medication, eradication of H. pylori, systemic mastocytosis, and in patients who do not respond to H2 blockers[15].

Remarkably, our findings indicate that only 45 people exhibit noteworthy gastrointestinal symptoms, as evidenced by an FSSG score over eight. It is important to note that this count excludes patients diagnosed with GERD or gastritis, as determined by the FSSG questionnaire. The mean FSSG score across all patients was 6.35, indicating that anti-secretory medications were not necessary. The patients from the Medicine department have a higher score of 13.58, since it comprises patients with conditions such as Acute gastritis, GERD, Acute liver disease, etc., which have a high baseline score. The average FSSG score in the remaining three departments is below 6. In a prior research done by Nousheen et al., they utilized the Reflux Disease Diagnostic Questionnaire (RDQ) to determine that only 12% of patients had notable symptoms.The user's text is incomplete and does not provide any information[16].

Out of the total number of patients, only 45 had gastrointestinal symptoms (FSSG score>8), which was the primary risk factor for taking anti-secretory drugs in combination with NSAIDs. Kumar et al. and Raghavendra's studies have found a significant occurrence of prescribing both PPI and NSAID together, however they did not utilize any criteria to evaluate gastrointestinal symptoms.

Drug interactions are most likely to occur in the presence of acid suppression. The gastrointestinal pH is modified, hence affecting the pharmacokinetics of several medicines. The most likely effect when anti-secretory medicines are administered alongside aspirin, Vitamin B12, and calcium supplements[17]. The expected medication interaction was most pronounced between vitamin B12 and PPI in 11 participants in our research. To prevent these interactions, provide the medications with a minimum gap of 2 hours. It is necessary to explicitly state this instruction on the case paper. The absorption of PPI also necessitates a low gastric environment in the parietal cells and canaliculi for its activation. In our current investigation, proton pump inhibitors (PPIs) were administered alongside antacids in a total of 8 prescriptions. The concurrent administration of these substances may modify the speed at which medications are absorbed and their capacity to be used by the body. It is important to consider the CYP 450 related interaction between PPIs and other medications, such as Clopidogrel, as this interaction might potentially decrease the efficiency of clopidogrel.Due to the nature of our medication utilization research, we were unable to provide any assessment on the effectiveness of the anti-secretory medicine. This is because our study was non-interventional, and the length and purpose of therapy with PPIs differed among the patients.

CONCLUSION

In our current investigation, we noticed that 64% of patients were administered anti-secretory medicines inappropriately, without a valid justification. Clinicians should be more cognizant of the prolonged negative consequences of anti-secretory medicines and the financial burden associated with their use. Clinicians should adhere to a logical approach while prescribing PPI's.

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REFERENCES

1. Kaur S, Rajagopalan S, Kaur N, Shafiq N, Bhalla A, Pandhi P, Malhotra S. Drug utilization study in medical emergency unit of a tertiary care hospital in north India. Emerg Med Int. 2014;2014:973578. doi: 10.1155/2014/973578. Epub 2014 May 5. PMID: 24883208; PMCID: PMC4026969.
2. Ayad K. Ali, Abraham G. Hartzema; Study Designs for Post-Authorization Safety Studies; Post-Authorization Safety Studies of Medicinal Products,Academic Press,2018,Pages 107-163,ISB9780128092170;https://doi.org/10.1016/B978-0-12-809217-0.00004-0.
3. Monique Elseviers, et al: Drug Utilization Research: Methods and Applications; ISBN: 978-1-118-94978-8 May 2016 Wiley-Blackwell 536 Pages
4. Ravi Shankar P, Partha P, Nagesh S. Prescribing patterns in medical outpatients. Int J Clin Pract 2002;56:549-51.
5. Mejia A, Kraft WK. Acid peptic diseases: pharmacological approach to treatment. Expert Rev Clin Pharmacol. 2009 May;2(3):295-314. doi: 10.1586/ecp.09.8. PMID: 21822447; PMCID: PMC3149864.
6. Madisch A, Andresen V, Enck P, Labenz J, Frieling T, Schemann M. The Diagnosis and Treatment of Functional Dyspepsia. Dtsch Arztebl Int. 2018 Mar 30;115(13):222-232. doi: 10.3238/arztebl.2018.0222. PMID: 29669681; PMCID: PMC5938438.
7. Das BP, Sethi A, Rauniar GP, Sharma SK. Antimicrobial utilization pattern in outpatient services of ENT department of tertiary care hospital of Eastern Nepal. Kathmandu University Medical Journal. 2005;3(12).370-5
8. Bindu S, Mazumder S, Bandyopadhyay U. Non-steroidal anti-inflammatory drugs (NSAIDs) and organ damage: A current perspective. Biochem Pharmacol. 2020 Oct;180:114147. doi: 10.1016/j.bcp.2020.114147. Epub 2020 Jul 10. PMID: 32653589; PMCID: PMC7347500.
9. Dhar A, Maw F, Dallal HJ, Attwood S. Side effects of drug treatments for gastro-oesophageal reflux disease: current controversies. Frontline Gastroenterol. 2020 Aug 12;13(1):45-49. doi: 10.1136/flgastro-2019-101386. PMID: 34966532; PMCID: PMC8666855.
10. Haroon M, Yasin F, Gardezi SK, Adeeb F, Walker F. Inappropriate use of proton pump inhibitors among medical inpatients: a questionnaire-based observational study. JRSM Short Rep. 2013 Jun 25;4(8):2042533313497183. doi: 10.1177/2042533313497183. PMID: 24040498; PMCID: PMC3767067.

11. WHO. The rational use of drugs. Report of the Conference of Experts, Nairobi, November 1985. Geneva, World Health Organization. 1987; 25-29.
12. Kusano M, Shimoyama Y, Sugimoto S. Development and evaluation of FSSG: frequency scale for the symptoms of GERD. J Gastroenterol 2004;39:888-91.
13. Ramirez E, Lei S, Borobia A. Overuse of PPIs in patients at admission, during treatment, and at discharge in a tertiary Spanish hospital. Current Clinical Pharmacol 2010;5:288-97.
14. Sandozi T. A Comparative Study of Cost Analysis of H2 Antagonists and Proton Pump Inhibitors in a Tertiary Care Hospital. Res J Pharma, Biol and Chem Sci 2013;4:888-97.
15. Kumar A, Dalai CK, Ghosh AK. Drug utilization study of co-administration of Non-steroidal anti-inflammatory drugs and gastro protective agents in an orthopaedics Out-patients department of a tertiary care hospital in West Bengal. IJBCP 2013;2:199-202.
16. Brandhagen DJ, Phaley AM, Onstad GR. Omeprazole use at an urban county teaching hospital. J Gen Intern Med 1995;10:513-5.
17. www.fda.gov/Drugs/DrugSafety/ [Last Accessed on 22/09/2015].