

Prescribing pattern of proton pump inhibitors among patients visiting the outpatient general medicine clinic in a tertiary care teaching hospital in Nepal

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Abstract

Purpose – The purpose of this study is to evaluate the prescribing pattern of proton pump inhibitors (PPIs) in patients visiting the outpatient general medical clinic in a Tertiary Care Teaching Hospital.

Design/methodology/approach – A hospital-based cross-sectional study was conducted in 419 patients aged ≥ 18 years, visiting the outpatient general medicine clinic of a tertiary hospital and prescribed with at least one PPI, from July to September 2016 using a purposive sampling technique. Descriptive statistics were performed using IBM-SPSS 20.0 (IBM Corporation, Armonk, NY, USA).

Findings – Patients were mostly less than 30 years (30.78%) and female (58.95%). Pantoprazole was the most frequently prescribed PPIs (57.04%). The majority of PPIs were prescribed for acid peptic disorder (APD) (33.65%), followed by non-steroidal anti-inflammatory drugs (NSAIDs) prophylaxis (30.79%). Most of the PPIs were prescribed for twice-daily administration (68.26%). Nearly one-fourth (21.72%) of the patients presented with at least one additional medical condition, and almost all (99%) patients were receiving at least one additional drug along with PPIs.

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Originality/value – The study suggests that PPIs are frequently prescribed and their use has been extended to other conditions that in fact do not require acid anti-secretory therapy. Result has highlighted the need for an interdisciplinary collaboration between pharmacists and medical professionals for the rational use of PPIs and promotion of PPIs prescription from the National List of Essential Medicines.

Keywords General medicine clinic, Outpatient, Prescription pattern, Proton pump inhibitors, Tertiary care teaching hospital, Nepal

Paper type Research paper

Introduction

Proton pump inhibitors (PPIs) are a group of drugs that are most effective at suppressing gastric acid secretion. Omeprazole, Esomeprazole, Dexlansoprazole, Lansoprazole, Pantoprazole and Rabeprazole fall under this group of drugs, and at comparable doses, these have equivalent efficacies [1]. The United States Food and Drug Administration (USFDA) has approved the use of PPIs in adults for the healing of erosive esophagitis (EE), gastroesophageal reflux disease (GERD), Zollinger-Ellison Syndrome (ZES), duodenal ulcer (DUs), maintenance of healed EE, risk reduction of gastric ulcer associated with non-steroidal anti-inflammatory drugs (NSAIDs) and *H. pylori* eradication to reduce the risk of (DU) recurrence in combination with antibiotics. However, not all PPIs are approved for each indication [1]. For most of these indications, the recommended maximum duration of therapy is 4 to 8 weeks [2]. Other indications, considered as the appropriate off-label use of PPIs are heartburn/regurgitation, refractory heartburn, Barrett's esophagus, non-variceal gastrointestinal (GI) bleeding, bleeding ulcers, prophylaxis of upper GI bleeding in critically ill, dyspepsia and esophageal strictures [3]. According to the International Classification of Disease, Ninth Edition, Clinical Modification (ICD-9-CM), epigastric and periumbilical abdominal pain are acceptable symptoms for PPI therapy for the possible minimal duration without continuation [4]. These conditions are being common medical problems, and PPIs have become the most widely prescribed medications globally [5].

The worldwide scenario of PPI prescription shows increasing use in both primary and secondary care. In the United Kingdom, the prescription for PPIs has doubled within five years [6]. In the year 2005, PPIs were the third most widely sold drug class in the United States, with annual sales of \$13.9 billion [7]. A consistent increase in the volume of prescriptions for PPIs was also reported in Australia [8], Germany [9] and the United States [10]. In 2006, global expenditure on PPIs was £7 billion, whereas England itself comprised £425 million [6]. There is no clear reason for the increased utilization and cost of PPIs. It is not explainable solely by increased morbidity, new indications, or a decrease in alternative medication [9].

In Nepal, Omeprazole has been enlisted in the National List of Essential Medicines [11]. Other PPIs, which are relatively safer than Omeprazole with non-differentiable efficacy, are also being marketed and used in Nepal. Developing countries like Nepal should utilize the drugs optimally from the National List of Essential Medicines, which eventually results in reduced healthcare cost of the country along with enhanced rational use of medicine. Hence, the study of the extent of Omeprazole use can also suggest and help the responsible authorized body to develop and implement policies regarding the effective utilization of essential medicines. Furthermore, there is a dearth of literature explaining the extent and pattern of PPI utilization in Nepal, which necessitates the determination of the rationality of PPI use. Therefore, this study aimed to evaluate the prescription pattern of PPIs among patients visiting the outpatient general medical clinic of a tertiary care teaching hospital.

Methodology

Design

This was a hospital-based cross-sectional study.

Population

Patients aged ≥ 18 years of age of either gender visiting the outpatient general medicine clinic of Chitwan Medical College (Chitwan, Nepal) between July and September 2016, prescribed with at least one PPI were eligible to be included in the study. Pregnant or lactating mothers, patients with a psychiatric disorder, from other departments, and those unable to communicate and understand the Nepali language were excluded.

Sample size

A sample size of 419 was taken to study prescription patterns of PPIs using a purposive sampling method.

Data collection

The eligibility of patients consenting to participate in this study was assessed. All information was collected in a well-designed proforma, which included age, sex and diagnosis/chief complaints, prescribed PPIs along with dose, frequency, duration, quantity, any comorbidities and other co-prescribed medicines. Personal identifiable information about patients or prescribers was not collected.

Data analysis

Descriptive statistics were performed using IBM-SPSS 20.0 (IBM Corporation, Armonk, NY, USA). The variables were presented as the mean, standard deviation, frequency and their respective percentage.

Ethics issue

This study was approved by the institutional review committee of Chitwan Medical College (CMC/IRC/42).

Results

Of the total of 419 patients, more than half (247; 58.95%) were female. The age of the patients ranged from 18 to 86 years, with the Mean \pm Standard deviation age 41.99 ± 17.58 years. The majority of patients were in age groups of less than 30 (129; 30.78) while 9 (2.14) were above 80 years, as shown in [Table 1](#).

Of the 419 patients, the majority of PPIs were prescribed for acid peptic disorder (APD) (141, 33.65%), followed by NSAIDs prophylaxis (129, 30.79%). Likewise, 46 (10.98%) PPIs were prescribed for epigastric/periumbilical pain, and 103 (25.06%) PPIs were prescribed

Characteristics	Categories	n (%)
Gender	Male	172 (41.05)
	Female	247 (58.95)
Age (years)	<30	129 (30.78)
	(30–39)	88 (21.00)
	(40–49)	74 (17.66)
	(50–59)	39 (9.30)
	(60–69)	45 (10.73)
	70–79	35 (8.35)
	80+	9 (2.14)

Table 1.
Demographic characteristics of patients (n = 419)

neither with NSAIDs nor in patients having any symptoms related to APD, as shown in Table 2.

Pantoprazole was the most commonly prescribed PPI (239, 57.04%) followed by Esomeprazole (92, 21.96%) and Rabeprazole (85, 20.29%) while Lansoprazole was the least frequently prescribed PPI (3, 0.72%). Omeprazole, which was listed in the National List of Essential Medicines, was not prescribed in the study population. The doses of PPIs used in the study were 40 mg for Esomeprazole and Pantoprazole, 30 mg for Lansoprazole and 20 mg for Rabeprazole as shown in Table 3.

The majority of patients were prescribed to take PPIs twice-daily (286, 68.26%) followed by 109 (26.01%) once-daily while 24 (5.73%) once daily administrations for continuous therapy after completion of the twice-daily regimen. The frequency of daily PPI administration on different conditions requiring PPI therapy as per the prescription is shown in Table 4.

Of the 419 patients, only 4 (1.0%) patients were receiving a PPI exclusively, while 111 (26.5%) received two additional drugs besides PPI, followed by three (94, 22.4%), four (70, 16.7%), five (46, 11.0%) and six to eight (36, 8.6%), respectively, as shown in Table 5.

Among the patients enrolled in this study, 415 (99%) were concomitantly receiving one or more groups of drugs, as shown in Figure 1.

Discussion

Our study evaluated the prescribing pattern of PPIs in the outpatient general medicine clinic of tertiary care hospitals of Nepal over a period of three months among 419 patients. Most of the patients were female with an average age of ~42 years. Interestingly, female patients were found to be at higher risk of receiving an unjustified prescription of PPIs. This may be because women tend to consult physicians more often and sooner than men.

Conditions	No. of patients	Patient %	
Acid peptic disorders (APD)	Duodenal ulcer	2	0.48
	Duodenitis	1	0.24
	Gastric ulcer	5	1.19
	Gastritis	37	8.83
	Gastroduodenitis	4	0.95
	Gastroesophageal reflux disease (GERD)	9	2.15
	Upper gastrointestinal (UGI) bleeding	1	0.24
	Unspecified in prescription	82	19.57
Sub-total	141	33.65	
Epigastric/periumbilical pain	46	10.98	
NSAIDs prophylaxis	129	30.79	
Not specified in the prescription	103	24.58	
Total	419	100.00	

Table 2.
Indication of PPIs
therapy

Drug name	Anatomical therapeutic classification (ATC) code	Dose(mg)	n (%)
Pantoprazole	A02BC02	40	239 (57.04)
Esomeprazole	A02BC05	40	92 (21.96)
Rabeprazole	A02BC04	20	85 (20.29)
Lansoprazole	A02BC03	30	3 (0.72)

Table 3.
PPI utilization

Table 4.
Frequency of daily PPIs administration on different conditions requiring PPI prescription as per the prescription

Frequency of PPI administration	Conditions	Number of patients	Percent (%)	
Once-daily	Acid peptic disorders (APD)	5	1.2	
	Gastritis Unspecified in prescription	14	3.3	
	Epigastric/periumbilical pain	11	2.6	
	NSAIDs prophylaxis	38	9.1	
	Not specified in the prescription	41	9.8	
	Twice daily	Duodenal ulcer	2	0.5
		Duodenitis	1	0.2
		Gastric ulcer	2	0.5
		Acid peptic disorders (APD)	19	4.5
		Gastroduodenitis	1	0.2
Gastroesophageal reflux disease (GERD)		9	2.1	
Upper gastrointestinal (UGI) bleeding		1	0.2	
Unspecified in prescription		64	15.3	
Epigastric/periumbilical pain		35	8.4	
NSAIDs prophylaxis		91	21.7	
Both*	Not specified in the prescription	61	14.6	
	Acid peptic disorders (APD)	3	0.7	
	Gastric ulcer	13	3.1	
	Gastritis	3	0.7	
Total	Gastroduodenitis Unspecified in prescription	4	1.0	
	Not specified in the prescription	1	0.2	
		419	100.0	

Note(s): *This includes once-daily administration of PPI after completion of twice-daily administration of PPI

Table 5.
Number of additional medicines per prescription

Additional drugs	No. of patients	Percentage (%)
0	4	1.0
1	58	13.8
2	111	26.5
3	94	22.4
4	70	16.7
5	46	11.0
6 or more	36	8.6
Total	419	100.00

The study revealed that most of the frequent correct indications for PPIs were APD (33.65%) followed by NSAIDs prophylaxis (30.79%). The effective use of PPI in APDs is evidence-based, for which there is a well-defined duration of therapy with a specified dose [1]. Any NSAIDs may increase the risk of bleeding, but effects are not cumulative and decrease quickly after discontinuation of the treatment. PPIs have been indicated for long-term preventive treatment and have proven useful for short NSAID courses, and acetylsalicylic acid therapy, mainly in aged patients [6]. In this study, PPI was prescribed for neither definitive nor prophylaxis and symptomatic treatment in 24.58% of patients. The reason for the inadequate use of PPIs could be co-morbidities and co-medication. The indication of PPIs in this situation is unclear. The findings of this study are consistent with the findings of another study [12], which showed that 29.4% of patients received a prescription for treatment

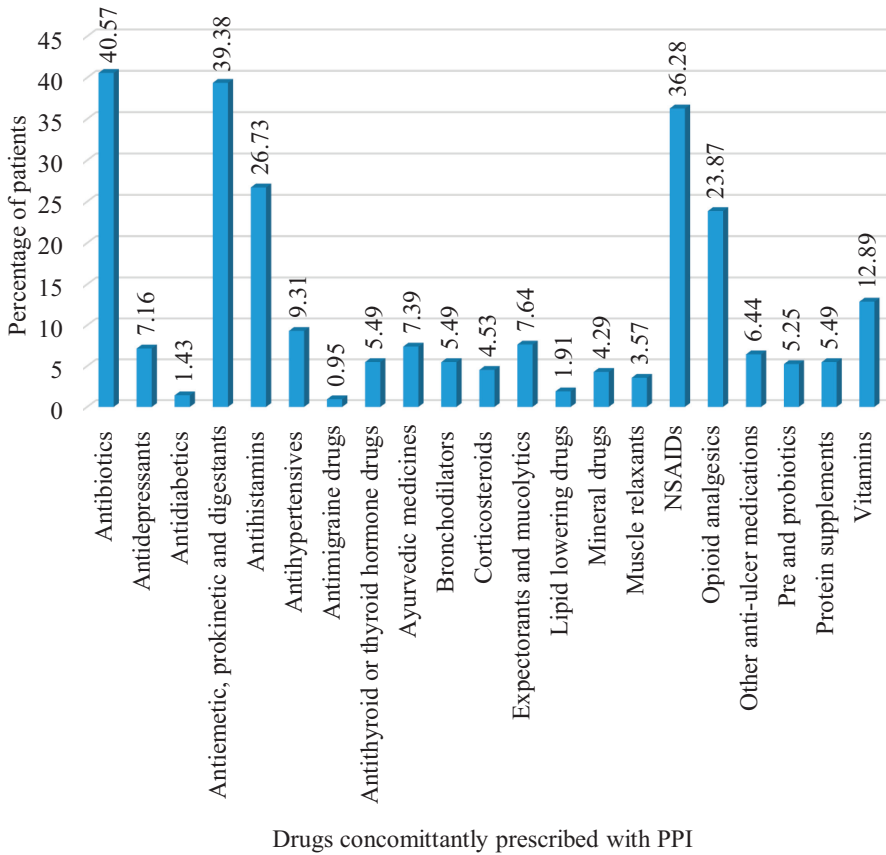


Figure 1. Drugs concomitantly prescribed with PPIs

of APD, 11.4% of patients received symptomatic relief, and 49.8% of patients received NSAIDs prophylaxis, while 9.4% of prescriptions were for other reasons, which are less than that of our study.

All five PPIs are effective and safe; however, there are differences in PPIs pharmacokinetic and pharmacodynamics profiles that might influence their clinical efficacy [8]. Our study revealed that more than half of the patients (57.04%) were treated with Pantoprazole, while about the same number (21.96% and 20.29%, respectively) received Esomeprazole and Rabeprazole, and only a few received Lansoprazole. Although Omeprazole is listed in the National List of Essential Medicines of Nepal, no one in the studied population was prescribed Omeprazole. In contrast to these findings, different studies reported that the majority of patients were treated with Omeprazole, while only a small group received other PPIs [4, 13].

Our study showed that the majority of patients (68.25%) were prescribed PPIs for twice-daily administration, while among this 5.73% of the patients were recommended to switch twice-daily therapy to once-daily therapy after completion of twice-daily therapy for a certain period. In (4.53%) patients, once-daily therapy was continued for maintenance of healed condition after completion of triple-drug therapy used for *H. pylori* eradication. A study from India showed that the frequency of PPI administration was once daily in most of the patients

[14]. The duration of therapy with PPI cannot be commented on since the duration of therapy varied between the patients with the same diagnosed condition.

Our study revealed a high prevalence of patients receiving multiple medications prescribed PPIs, except in only 1% of the patients. In most of the patients (26.5%), two additional drugs were prescribed along with a PPI. Up to three additional drugs were prescribed for 62.7% of patients, which explains the use of multiple drugs in patients, with approximately one-third (36.3%) of patients being prescribed more than three additional drugs. The pattern of concomitant prescription of drugs with PPI in this study differs from that of another study [14], where PPIs were prescribed exclusively in 21.2% of patients and most of the patients (31.9%) received a prescription with one additional drug with the use of more than three additional drugs in 6.1% of the patients.

There are some limitations to our study. This was a single-centered study conducted in a single center of the central part of Nepal in a relatively small sample size. Therefore, the generalizability of the findings remains to be explored. Ideally, patients should have to undergo an endoscopy to verify the diagnosis, but this study could not cover it, which is the other major limitation of the study. Determining indication depending on the prescription alone was a potential bias because it is possible that sometimes the prescription might have been justified by the physician during the patient assessment but was not documented in the prescription. However, the data on PPI use could be particularly useful for policy formulation of PPIs in Nepal.

Conclusion

Our study suggests that PPIs are frequently prescribed in patients visiting the outpatient general medicine clinic of central Nepal. The use of PPIs has been extended to other conditions that generally do not require acid anti-secretory therapy. These should be used only when there is documented evidence of a GI disorder that cannot be treated with an H₂-receptor antagonist and where a PPI use is clinically justified. Moreover, there should be increased interdisciplinary collaboration between pharmacists and medical professionals for the rational use of PPIs, and prescribing PPIs from the National List of Essential Medicines should also be promoted.

Conflicts of Interest: None

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