



# An Investigation Performed in A Bangladeshi General Hospital on The Use of Proton Pump Inhibitors Drugs By Patients

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## SUMMARY

**Introduction:** Proton pump inhibitors (PPIs) are anti-ulcer drugs that have reportedly been used inappropriately in therapeutic settings, raising the risk of adverse effects, drug interactions, and costs.

**Aim:** This study aimed to evaluate the inappropriate use of PPI medication and which category of PPIs frequently was used for patients in Bangladeshi hospitals.

**Material and Methods:** A one month cross-sectional study was carried out in a tertiary care hospital to evaluate the kinds of PPI prescriptions, their appropriateness, and their tendency to be utilized among patients.

**Results:** Among 298 patients interviewed, 140 patients used PPIs inappropriately. The most common reasons for inappropriate use included gastric appetite (29.59%, 29 individuals) and nausea. Other reasons included (15%) no clear indication, (20%) gastric discomfort, (13.57%) asthma, and (8.57%) infections. Esomeprazole was the most prescribed PPI, used by 41% of patients, followed by omeprazole at 32%. Nearly 44% of the 140 patients exhibited a strong tendency to use PPIs.

**Conclusion:** Important steps must be taken to ensure that PPIs are used properly, to increase knowledge, and implement educational TV programs that can reduce the risk of drug interactions, side effects, and unnecessary expenses.

**Keywords:** PPIs, Medication, Esomeprazole, Overuse, Awareness, Gastric Discomfort, Morbidity, Tendency, Indication

## INTRODUCTION

Proton pump inhibitors (PPIs) are well-researched medications used to treat various upper gastrointestinal disorders by effectively reducing stomach acid [1]. These drugs permanently inhibit the gastric H<sup>+</sup>, K<sup>+</sup> ATPase pump, leading to a decrease in both basal and stimulated stomach acid output [2]. It has been shown that they are effective in treating peptic ulcers, dyspepsia, and gastro-esophageal re-

flux disease (GERD) [3-6]. The National Institute for Health and Clinical Excellence (NICE) issued recommendations for proton pump inhibitors in 2000 [7]. It offers advice about the use of specific pharmaceuticals that are fairly selective, particularly when it comes to long-term use. The rise in PPI use is far higher than the change in morbidity, even with limited prescribing guidelines [8]. Frequently admin-

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istered for longer than recommended, these have no clear indication. Despite the common belief that overprescribing occurs mainly in primary care, secondary care also frequently misuses PPIs [7].

In Australia [9], Ireland [10], and the UK [11], proton pump inhibitor use among hospital inpatients accounted for 63%, 33%, and 67% of patients, respectively, who did not meet the country's prescription medication requirements. It seemed clear that many patients visiting the hospital's in-patient and out-patient departments were regularly obtaining PPI medication for diseases for which PPIs have not been proven to be helpful, or for poorly defined reasons. These unapproved or inappropriate indications include co-prescriptions of aspirin, NSAIDs, or corticosteroids in patients who are asymptomatic, non-specific abdominal symptoms without features related to acid reflux, and most frequently, long-term repeat prescriptions for previously diagnosed but resolved conditions. The available data indicates that PPIs are frequently abused [12-16]. A study conducted in New Zealand discovered that 40% of hospital inpatients were not taking proton pump inhibitors as prescribed [17]. A recent study conducted in Bangladesh found that 87.2% of patients who were discharged from a tertiary hospital had taken PPIs, whereas 71.5% of patients had no medical reason for doing so [18].

Because PPIs are often prescribed in general practice, doctors often assume that using PPIs for long periods of time poses no risks. Healthcare practitioners must regularly evaluate the indication and duration of PPI usage in order to prevent abuse and the associated bad effects. Moreover, the overuse of PPIs has a significant financial impact on patient care and public health spending [19].

## AIM

This study also aimed to identify the type of PPI that is regularly prescribed to these people and the usage-related characteristics that are highly associated with inappropriate PPI usage.

## MATERIAL AND METHODS

During (January 2024), this study was conducted at Filaria and General Hospital in Savar, Dhaka, Bangladesh. About 298 hospital-

ized patients were interviewed, among them 140 patients taking PPI medication improperly were found mainly assessed in this study. We reviewed their medications, age, and past medical history in addition to their current medical information. Using the demographic data, PPI agent used, PPI usage pattern, etc., a pro forma was developed. The appropriateness of PPI use was evaluated based on indications outlined by the Food and Drug Administration (FDA) and National Institute for Clinical Excellence (NICE).

Indications for use of PPIs by (FDA and NICE) [27, 28]:

- GERD and its clinical manifestations (including non-erosive disease, symptomatic control\*, esophageal strictures, Barrett's esophagus;
- HP eradication in combination with antibiotics;
- Short-term treatment of HP-negative peptic ulcers and maintenance Therapy;
- Treatment of gastric ulcers associated with NSAIDs;
- NSAID-induced dyspepsia;
- Erosive esophagitis – healing and maintenance therapy;
- Reduction of risk of gastric ulcers in NSAID users with a high risk\*\* of gastrointestinal complications or COX-2 inhibitor users with previous history of upper gastrointestinal bleeding;
- Gastric pathological hyper-secretion (Zollinger-Ellison disease);
- Critically ill patients, under prolonged mechanical ventilation;
- Short-term treatment\* of patients with functional dyspepsia.

\*4–8 weeks of treatment, followed by minimum effective dose or use on demand, if symptoms persist.

\*\*Age >65 years or concomitant use of corticosteroids, anti-platelet agents, or anticoagulants or previous history of peptic ulcer disease.

This academic study was reviewed by ethical approval committee of Jahangirnagar University with ref. no. BBEC, JU/2024(18). Participants gave their consent to share any personal information, and they did so voluntarily, understanding that the information would be used appropriately. The Declaration of Helsinki and Good clinical standards were adhered to throughout the study's execution. Written informed consent was obtained from every research participant.

Statistical analysis was performed us-

**Table 1.** Demography of population

Variable	Number N=140	Percent (%)	
Age group (year)	25 - 35	50	35.71
	36 - 45	38	27.14
	46 - 60	52	37.14
Gender	Male	78	55.71
	Female	62	44.28

**Table 2.** Use of PPI with inappropriate indication

Variable	Number	Percent (%)
To increase appetite	30	21.42
Gastric discomfort	28	20.00
Infection	12	8.57
No clear indication	21	15.00
Asthma	19	13.57
Nausea	30	21.42
Total N=140		100.00

**Table 3.** Tendency to use PPI among respondents

Variable	Number	Percent (%)
Strong tendency	62	44.28
Moderate tendency	52	37.14
Less tendency	15	10.71
Feeling doubt	11	7.86
Total N=140		100.00

ing MS Excel software.

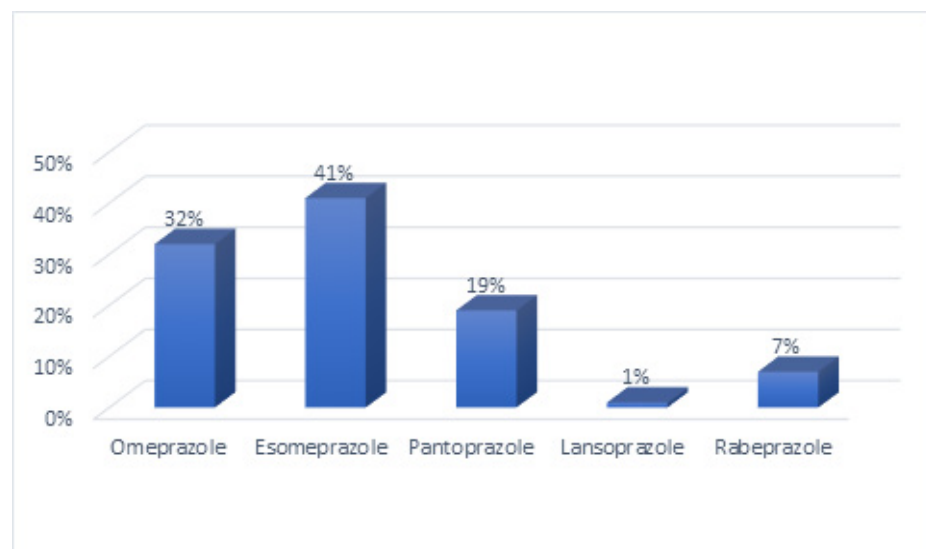
## RESULTS

During the study period, a total of 298 PPI-prescribed patients were interviewed. According to FDA and NICE guidelines it was found that 140 patients consume PPIs in unsuitable condition. All of 140 patients were in the age

between 25-60 years. Among the 140 PPI users, 78 were male and 62 were female. Different age group with number of individuals were 25-35 years (35.71%), 36-45 years (27.14%), 46-60 years (37.11%) (Table 1).

## DISCUSSIONS

A total of 298 patients who were prescribed

**Figure 1.** Percentage of different PPIs used by respondents

PPIs were interviewed during the research period. In accordance with NICE and FDA standards, 140 people were discovered to be using PPIs when they ought not to be. After performing this study it was found that, most of the users who used PPI inappropriately constitutes 29 individuals (29.59%) for the reason to gastric appetite and for nausea feeling among the total population. Other percentage including (15%) for no clear reason, (20%) for gastric discomfort, (13.57%) for asthma and (8.57%) for infections (Table 2). After talking with every respondent, it was discovered that the majority of respondents (44.28%) had a strong inclination to take PPI drugs; only 10.71 percent of all respondents showed a less desire to use PPI, 37.14% showed a moderate inclination to use PPI agents, and 7.86 percent of respondents were unsure if taking PPIs was safe (Table 3). Esomeprazole was prescribed and used in the majority of patients (41%) out of the different PPI formulations; 32% of patients received omeprazole, 19% received pantoprazole, and 7% and 1% received rabeprazole and lansoprazole, respectively (Figure 1).

The results of this analysis are consistent with previous research, highlighting that incorrect prescriptions and excessive PPI use occur across various countries and healthcare systems [30]. Among the 298 patients, 46.98% (140 patients) were found to be taking PPIs without a valid reason, a figure similar to the 54.1% reported by Osama et al. [29]. The indications for appropriate PPI use that were taken into consideration in this analysis comprised a set of well-established indications (FDA and NICE) as well as other indications that are emerging but for which there is currently insufficient scientific evidence, necessitating additional research.

The overuse of PPIs in hospitals has not been fully understood or looked into. Due to insufficient or incorrect understanding about the risk of ulcer development during hospitalization, clinicians may give PPIs with the good purpose of preventing ulcer development, even in violation of current PPI recommendations. Some clinicians regularly give PPIs because they think they are long-term, safe medications, without considering the benefits and drawbacks of long-term therapy [20]. More recent studies have shown that physicians often neglect to track and document PPI prescriptions, which frequently results in the continuous or permanent use of these drugs

[21, 22]. PPI prescription errors are a serious problem for a number of reasons. First, giving unimportant medicine causes poly-pharmacy, which can have negative consequences and interact with other medications. Second, it has been discovered that the use of PPIs is strongly linked to both diarrhea and community-acquired pneumonia [31].

While proton pump inhibitors are effective drugs with minimal adverse effects, there are relatively few situations where long-term use is warranted. Alarming, a high proportion of healthcare providers continue to prescribe these medications, frequently disregarding established indications [23]. Long-term PPI use is thought to be associated with an increased risk of hip fracture [24]. A large-scale study that was published in the Journal of the American Medical Association in 2016 revealed a strong correlation between long-term PPI use and a higher risk of chronic kidney disease (CKD). Long-term PPI users had a 20–50% higher risk of developing chronic kidney disease [25]. It is well recognized that chronic conditions, polypharmacy, and inappropriate medicines are more common in the elderly [26]. These variables increase the risk that any medicine, including PPIs, will have negative side effects for older adults.

To mitigate the inappropriate use of PPIs, it is essential to ensure that prescriptions are well-documented and justified upon patient discharge. Raising awareness among the general population can also help reduce the misuse of PPIs and subsequent adverse events.

## CONCLUSION

In summary, less than half of the research participants were taking PPIs for inappropriate reasons. To address this trend, implementing educational programs for physicians on rational prescribing practices, following official guidelines, and adhering to PPI use guidelines may be beneficial. It is necessary to take proactive measures to enhance PPI usage while sticking to recognized and approved indications and regularly reevaluating the necessity of its prescription in order to promote ethical prescribing practices. Thus, it is imperative to take important initiatives aimed at proper PPI utilization, raising awareness, and implementing TV programs that can reduce potential drug interactions, adverse effects, and avoidable financial costs.

## LIMITATIONS OF STUDY

The current study's design has few intrinsic flaws, including missing data of patients. Due to this constraint, a number of patients may have been prescribed PPIs for a defined use that was not disclosed, and a small number of patients were included in this study.

## CONFLICTS OF INTEREST

All authors declare no conflict of interest.

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# Ispitivanje upotrebe inhibitora protonске pumpe među pacijentima Opšte bolnice u Bangladešu

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## KRATAK SADRŽAJ

**Uvod:** Inhibitori protonске pumpe (PPI) su lekovi protiv čira koji su navodno korišćeni na neodgovarajući način u terapijskim okruženjima, što povećava rizik od neželjenih efekata, interakcija lekova i troškova.

**Cilj:** Ova studija je imala za cilj da proceni neodgovarajuću upotrebu IPP lekova i koja kategorija PPI se često koristila za pacijente u bolnicama u Bangladešu.

**Materijal i metode:** Jednomesečna studija preseka sprovedena je u bolnici tercijarne nege da bi se procenile vrste recepata za PPI, njihovu prikladnost i njihovu sklonost da se koriste među pacijentima.

**Rezultati:** Među 298 intervjuisanih pacijenata, 140 pacijenata je neprikladno koristilo PPI. Najčešći razlozi za neodgovarajuću upotrebu bili su gastrični apetit (29,59%, 29 osoba) i mučnina. Ostali razlozi su uključivali (15%) bez jasne indikacije, (20%) nelagodnost u želucu, (13,57%) astmu i (8,57%) infekcije. Esomeprazol je bio najčešće propisivani PPI, koji je koristilo 41% pacijenata, a zatim omeprazol sa 32%. Skoro 44% od 140 pacijenata pokazalo je jaku tendenciju da koriste PPI.

**Zaključak:** Moraju se preduzeti važni koraci kako bi se osiguralo da se PPI pravilno koriste, kako bi se povećalo znanje i implementirali obrazovni TV programi koji mogu smanjiti rizik od interakcija sa lekovima, neželjenih efekata i nepotrebnih troškova.

**Ključne reči:** PPI, lekovi, esomeprazol, prekomerna upotreba, svest, gastrična nelagodnost, morbiditet, tendencija, indikacije

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