

Original Research Article

Inappropriate use of proton pump inhibitors in non-critical indoor patients in a tertiary care teaching hospital in Eastern India

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ABSTRACT

Background: Proton pump inhibitors are one of the most commonly used drugs worldwide. Often they are used for inappropriate indications too, imposing economic burden to patients and governments. Many studies have showed equipotent efficacy of oral and intravenous proton pump inhibitor therapy. Despite that, most of the hospitalized patients receive intravenous proton pump inhibitor without appropriate indications. This study aimed to assess use of proton pump inhibitors in government hospital.

Methods: It was an observational cross-sectional study done in the general medicine department of a tertiary care teaching hospital in Eastern India, including 800 noncritical patients. Objective was to assess the use of proton pump inhibitors (indications, route of administration, dosing frequency).

Results: 100% patient received intravenous proton pump inhibitor irrespective of diagnosis. 80% of them received it twice daily and 18% received it once daily. Majority of the patients received intravenous proton pump inhibitor despite taking other drugs by oral route.

Conclusions: Most of the PPI administration was done without appropriate indication. All patients received Intravenous proton pump inhibitors, which may impose economic burden on a government hospital. Majority of the patients received proton pump inhibitors twice daily. These approaches are not cost effective and need to be rectified.

Keywords: Indoor patients, Intravenous, Once daily, Oral, Proton pump inhibitor, Twice daily

INTRODUCTION

Proton-Pump Inhibitors (PPIs) is the most commonly used evidence-based therapy for upper gastrointestinal disorders, including gastroesophageal reflux disease, dyspepsia, and peptic ulcer disease. The effectiveness of PPIs has led to overutilization often, exposing patients to an increasing number of potential risks. The overutilization of PPIs in ambulatory care settings is often a result of failure to re-evaluate the need for continuation of therapy, or insufficient use of on-demand and step-down therapy. PPI overutilization in the inpatient setting is often a result of inappropriate stress ulcer prophylaxis in non-intensive care unit patients.¹

Reducing inappropriate prescribing of PPIs in the inpatient and outpatient settings can minimize potential for adverse events and foster controllable cost expenditure. A cross-sectional web-based survey in a university-affiliated tertiary care hospital in Massachusetts found that 69% of physicians prescribed SUP to over 25% of patients in the non-ICU setting, on account of fear of upper GI bleeding.²

A retrospective review of pharmacy claims data in 29,348 commercial and Medicare patients with an acute care hospital admission and subsequent discharge on a PPI determined that 69% were prescribed a PPI inappropriately at discharge. Rates of inappropriate PPI

utilization were statistically equivalent for ICU and non-ICU patients (68.7% versus 68.9%, respectively).³

A study conducted in an Ann Arbor, MI Veterans' Administration hospital determined that of 946 patients, only 35% were prescribed PPI therapy for an appropriate documented upper GI diagnosis, 10% received PPIs empirically for symptomatic treatment based on extraesophageal symptoms, 18% received PPIs for gastroprotection, and 36% had no documented appropriate indication for PPI therapy.⁴

Multiple studies have shown overuse of proton pump inhibitors in intravenous route in hospitalized patients (both ICU and non-ICU) have significantly increased the cost of therapy.^{5,6} Also, studies have confirmed that oral and intravenous pantoprazole are equivalent in their ability to suppress gastric acid secretion in patients with gastroesophageal reflux disease.⁷

Thus, Judicious surveillance of prescription refills in the outpatient setting with re-evaluation of justification for continued treatment, as well as elimination of stress ulcer prophylaxis in non-ICU patients who do not meet evidence-based criteria, can minimize cost expenditure and potential risk of adverse effects.

In this study, author have evaluated use of proton pump inhibitor in noncritical patients admitted in medicine department of a government hospital in eastern India.

METHODS

The study was observational cross-sectional study done in the general medicine department of a tertiary care teaching hospital in Eastern India.

The study population of male and female patients admitted in General medicine department. Study period was 3 months (July 2019 to September 2019). Study area was Department of General Medicine, College of Medicine and JNM Hospital, Kalyani

Objectives to assess the use of proton pump inhibitors (indications, route of administration, dosing frequency)

- Whether it was used for proper indications
- Whether Intravenous route was used when patient was able to swallow.
- Whether it was used once daily or twice daily.

Inclusion criteria

- All the patients admitted in general ward of Medicine department of the hospital during the study period.

Exclusion criteria

- Patients admitted in ICU/HDU

- Patients who did not or could not give the consent to participate in the study
- After getting clearance from the Institutional ethics committee and getting informed consent from the patients, data collection was started. Bed head tickets of 400 male and 400 female patients were analyzed to see the use of proton pump inhibitors. Data collection was done during discharge of the patient from hospital and data was collected for 2 months in July and August 2019.

Following data were collected in case record form-

- Age and sex of patients
- Disease suffering from
- Presence of abdominal pain
- Presence of nausea vomiting
- Route of administration of other drugs
- Proton pump inhibitor used
- Dose of proton pump inhibitor
- Route of administration
- Frequency of giving proton pump inhibitors

Then appropriate statistical analysis was done by MS Excel.

RESULTS

Among the patients admitted in general medicine department in the hospital, prescription in the bed head tickets of 400 male and 400 female patients were analyzed to see the use of proton pump inhibitors.

Proton pump inhibitor was used in all patients irrespective of diagnosis and all received it by intravenous route.

It was seen that all 800 patients received intravenous pantoprazole (40 mg per vial) during their stay in hospital. Among them, 144 patients (86 male and 58 female) received it once daily and 640 patients (301 male and 339 female) received IV pantoprazole twice daily. In few patients (16) who were having hematemesis/ malena, IV pantoprazole was given 3 or 4 times daily.

So, among 800 patients, 18% received IV pantoprazole once daily, 80% received it twice daily and 2% received it more frequently (Figure 1).

During their stay in hospital, it was not switched to oral proton pump inhibitors though some other drugs may be received by oral route by patients.

Among the 800 patients, 108 patients (13.5%) received all drugs by intravenous route, among the rest, few were oral medicine, but all received proton pump inhibitors by intravenous route. Among the patients, 108 patients had pain abdomen, 73 had nausea vomiting and in 186 patients it was given for stress ulcer prevention like in patients of cerebrovascular accident, infections. In rest 433 patients

(56.62%), indication was not clear. Different common indications for PPI use in the study population has been shown in (Figure 2).

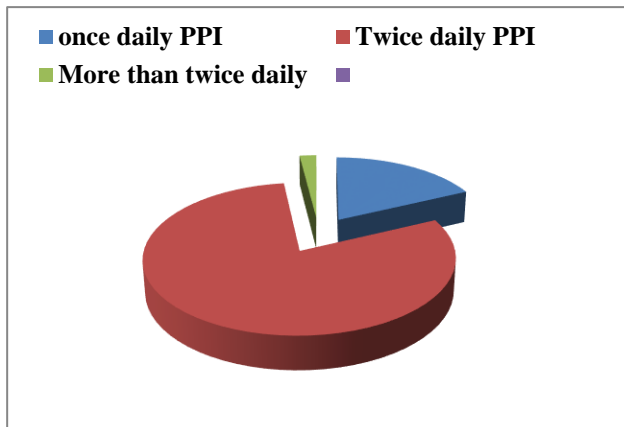


Figure 1: Frequency of administration of PPI.

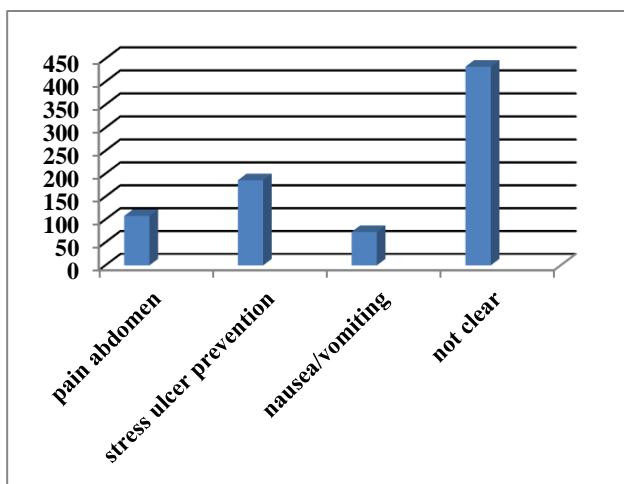


Figure 2: Indications for PPI use.

DISCUSSION

Oral and intravenous pantoprazole are equipotent in raising gastric pH.

A literature search using MEDLINE, EMBASE and the Cochrane Library, between 1990 and February 2016, to identify all Randomized Controlled Trials (RCTs) that assessed the efficacy of PPIs administered by different routes. Nine RCTs, involving 1036 patients, were analysed. It showed that oral and IV PPIs have a similar efficacy after endoscopic treatment in controlling recurrent bleeding, the requirement for surgery and mortality in patients with peptic ulcer bleeding from different stigmata. Oral PPIs probably present a cost saving approach in hospital administration.⁸

In a prospective study on 276 hospitalized patients in USA, the majority (75.4%) of IV PPI prescriptions were

deemed inappropriate in terms of either indication for use, dose or duration of therapy.⁹

In this study, 100 percent patient received intravenous pantoprazole, which is almost 8-10 times more costly than oral tablets. This practice is not cost effective and thus may create burden on government as this was a government hospital and treatment are completely free of cost.

Also, when author assessed whether once daily or twice daily pantoprazole has any difference in the efficacy of gastric acid secretion, a study done on 233 patients revealed that once daily oral PPI dosing at hospital discharge was not inferior compared to twice daily dosing. A meta-analysis done by Zhang et al, showed that patients with GERD respond to pantoprazole twice daily treatment better than once daily therapy in terms of endoscopic healing rate at 8 weeks, however there was no significant difference in symptom relief and 24 hr pH status.¹⁰

In a previous study from India, 58% hospitalized patients received PPI for inappropriate indication.¹¹ In this study, it was 56.62%. so increased awareness must be created among the clinicians to make the use of PPI more rational and cost effective,

Well-designed RCTs are needed to be conducted with a larger quantity of participants to more effectively determine the efficacy and safety profiles of PPI twice daily treatment for GERD.

In this study, 80 percent patient received twice daily pantoprazole therapy. Most of them are given in absence of reflux symptoms. So, this twice daily PPI therapy is also not cost effective in government hospital setting.

Another observation was that though patients were receiving many drugs by oral route, still the route of PPI administration were not changed to oral.

CONCLUSION

- Proton pump inhibitors have been overused across the world for long time.
- This study also showed overuse of proton pump inhibitors in non-critical indoor patients.
- Most of the PPI administration was done without appropriate indications.
- All patients received Intravenous proton pump inhibitors, which may impose economic burden on a government hospital.
- Majority of the patients received proton pump inhibitors twice daily.
- These approaches are not cost effective and need to be rectified.

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Conflict of interest: None declared

Ethical approval: The study was approved by the Institutional Ethics Committee

REFERENCES

1. Heidelbaugh JJ, Kim AH, Chang R, Walker PC. Overutilization of proton-pump inhibitors: what the clinician needs to know. *Therapeutic advances in gastroenterol.* 2012;5(4):219-32.
2. Hussain S, Stefan M, Visintainer P, Rothberg M. Why do physicians prescribe stress ulcer prophylaxis to general medicine patients?. *Southern med J.* 2010;103(11):1103.
3. Thomas L, Culley EJ, Gladowski P, Goff V, Fong J, Marche SM. Longitudinal analysis of the costs associated with inpatient initiation and subsequent outpatient continuation of proton pump inhibitor therapy for stress ulcer prophylaxis in a large managed care organization. *J managed care pharm.* 2010;16(2):122-9.
4. Heidelbaugh JJ, Goldberg KL, Inadomi JM. Magnitude and economic effect of overuse of antisecretory therapy in the ambulatory care setting. *The Am J managed care.* 2010;16(9):e228-34.
5. Erstad BL, Camamo JM, Miller MJ, Webber AM, Fortune J. Impacting cost and appropriateness of stress ulcer prophylaxis at a university medical center. *Critical care med.* 1997;25(10):1678-84.
6. Nasser SC, Nassif JG, Dimassi HI. Clinical and cost impact of intravenous proton pump inhibitor use in non-ICU patients. *World J Gastroenterology: WJG.* 2010;16(8):982.
7. Metz DC, Pratha V, Martin P, Paul J, Maton PN, Lew E, Pisegna JR. Oral and intravenous dosage forms of pantoprazole are equivalent in their ability to suppress gastric acid secretion in patients with gastroesophageal reflux disease. *The Am J gastroenterol.* 2000;95(3):626.
8. Tringali A, Manta R, Sica M, Bassotti G, Marmo R, Mutignani M. Comparing intravenous and oral proton pump inhibitor therapy for bleeding peptic ulcers following endoscopic management: a systematic review and meta-analysis. *British J clin pharmacol.* 2017;83(8):1619-35.
9. Craig DG, Thimappa R, Anand V, Sebastian S. Inappropriate utilization of intravenous proton pump inhibitors in hospital practice—a prospective study of the extent of the problem and predictive factors. *QJM: An Intern J Med.* 2010;103(5):327-35.
10. Zhang H, Yang Z, Ni Z, Shi Y. A meta-analysis and systematic review of the efficacy of twice daily PPIs versus once daily for treatment of gastroesophageal reflux disease. *Gastroenterol res practice.* 2017;2017.
11. Tadv NA, Shareef SM. Use of proton pump inhibitors in general practice: Is it rationale?. *Intern J Med Res Health Sci.* 2014;3(1):37-42.

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