

Research Article



Prospective Assessment of Prescribing Pattern of Proton Pump Inhibitors in A Tertiary Care Hospital in Chennai

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ABSTRACT

The aim of our study was to assess the prescription pattern in patients prescribed with Proton Pump Inhibitors. Our objectives were to analyze the overall use of Proton Pump Inhibitors with regard to Indication, Dose, dosage and Duration of therapy and to assess the changeover of therapy from an oral Proton Pump Inhibitors to IV Proton Pump Inhibitors and vice versa. The Prospective Observational study was conducted in Vijaya hospital, Chennai for 6 months period in patients who were prescribed with PPIs. Demographic details, co-morbidities as well as the prescription details were analyzed. A total of 300 patients were enrolled in the study. PPI were prescribed for drug related conditions in 67% of patients, 9.6% were prescribed for GI disorders. Pantoprazole was the most common choice of PPI. About 23% of the study populations were prescribed with PPI without any indication. The knowledge of prescribing pattern can lead us towards the rational use of drugs and can help us in improving patients quality of life as well as economic burden.

Keywords: PPI, Prescribing pattern, Changeover.

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INTRODUCTION

Proton pump inhibitors (PPIs) are among the most frequently prescribed drugs globally. Although they are cost effective when used appropriately, studies show that they are prescribed without a clear indication in up to 70% of cases. Even though the absolute risk of harm to individuals from PPIs is low, their wide spread, long-term use can cause adverse effects that contribute to significant negative impacts at a population level. Action is required to limit inappropriate prescribing of PPIs and support deprescribing in patients on long-term therapy for whom the original indications no longer apply¹.

Proton pump inhibitor (PPI) is a prodrug which is activated in the presence of acid. Activated drug (PPI) binds covalently to the gastric H⁺, K⁺ -ATPase via disulfide bond. Omeprazole was the first PPI introduced followed by pantoprazole, lansoprazole and rabeprazole. Though these PPIs share the core structures benzimidazole and pyridine, their pharmacokinetics and pharmacodynamics are a little different².

Proton pump inhibitors are used mainly to promote healing of gastric and duodenal ulcers and to treat gastroesophageal reflux disease (GERD), including erosive esophagitis, which is either complicated or unresponsive to treatment with H₂-receptor antagonists. Proton pump inhibitors are also used as first line treatment for pathological hypersecretory conditions, including the Zollinger-Ellison syndrome³.

Available evidences suggest that PPI use is associated with an increased risk of both acute and chronic kidney disease, hypomagnesemia, C difficile infection, and osteoporotic fractures. Caution in prescribing Proton Pump Inhibitors should be used in patients at high risk for any of these conditions. Given the association with kidney disease and low magnesium levels, serum creatinine and magnesium levels should probably be monitored in patients using PPIs, especially those using high doses⁴.

All proton pump inhibitors are metabolized by hepatic P450 cytochromes, including CYP2C19 and CYP3A4. Because of short half-lives of proton pump inhibitors, clinically significant drug interactions are rare. The FDA has issued a warning about a potentially important adverse interaction between clopidogrel and proton pump inhibitors⁵.

However, supported by its excellent effectiveness and safety profile, there has been an expansion of its use in inappropriate clinical contexts, such as the prophylaxis of gastrointestinal bleeding in low-risk patients and usage for longer than indicated. This increased prescription of PPI, allied to its growing accessibility due to the



emergence of generics and over-the-counter availability, places PPI amongst the most selling drugs in the world⁶.

Drug utilization studies are continuous programs which help us to review, to analyze and to interpret the trends of drug used against pre-determined standards at various levels of the healthcare system⁷. Prescription writing requires regular updating of knowledge and skill, as it reflects the clinical judgments and prescribing pattern. For rational prescription updated knowledge and adherence of prescribing policies is must, while irrational prescription leads to unproductive and risky treatment⁸. Rational use of medicine is defined by the WHO as, 'Patients receive medications appropriate to their clinical needs, in doses that meet their own individual requirements, for adequate period of time and at lowest cost to them and their community'⁹⁻¹⁰.

Several guidelines have been published related to appropriate use of PPIs, known as US Food and Drug Administration (USFDA) guideline, American College of Gastroenterological Association (ACG) and the American Gastroenterological Association (AGA) guideline, and National Institute of Clinical Excellence (NICE)¹¹.

MATERIALS AND METHODS

Study Design

The study is a Prospective Observational study.

Study Site

The study was conducted in a 750 bedded multispecialty hospital located at Vadapalani Chennai.

Study Period and Ethical Clearance

The study was approved (Ref No: 7938/KKCP/2019 dated 04/Mar/2019) by Institutional Ethics Committee of Vijaya Hospital. The study was carried out for the period of 6 months from April 2019 to September 2019.

Study Population Size

300 inpatients prescribed with Proton Pump Inhibitors were included in the study based on the inclusion and exclusion criteria after getting the patient consent and the required data was collected in specially designed data entry form.

Inclusion criteria

- Patients of either sex and aged >18 years
- All In-Patients prescribed with Proton Pump Inhibitors
- Patients who are willing to give consent.

Exclusion criteria

- Patients of either sex and aged 18 or < 18 years
- Patients who are not willing to give consent.
- Patients who are not prescribed with proton pump inhibitors.

Statistical Analysis

The obtained data was entered into Microsoft excel. The demographic descriptive data was reported in terms of mean median and mode.

RESULTS AND DISCUSSION

A total number of 300 patients based on the sample size were included in the study based on the inclusion and exclusion criteria. The demographic details, clinical data and prescription details were collected from the patients for the study.

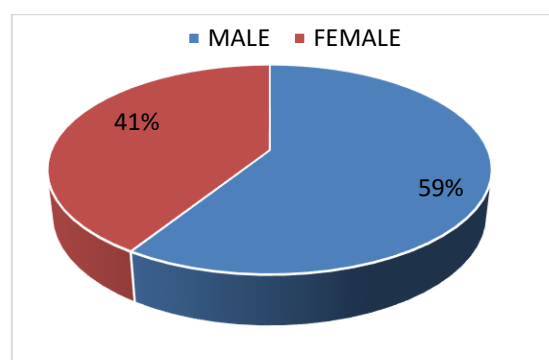


Figure 1: Gender wise distribution

Our study indicates that the majority of patients within the study population were males (59%) compared to females (41%). In a study conducted by D. G. N Craig et al.,¹² reported similar finding in which males were predominant than females. (Fig.1)

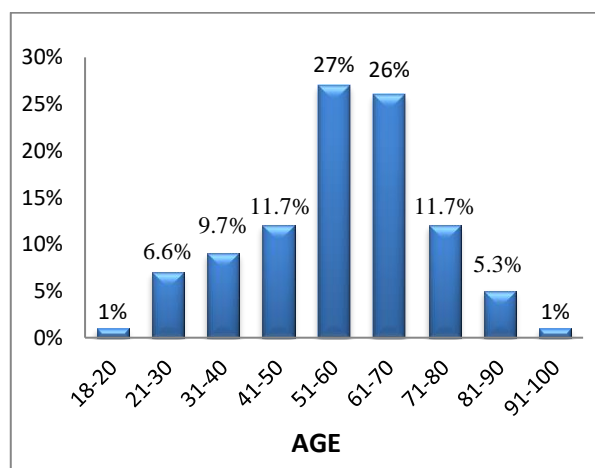


Figure 2: Age wise distribution

In our study the incidence of PPI use was found more in the age group of 51 – 60 years (27%) followed by 61 – 70 years (26%). In a similar study conducted by Jemi Elza et al.,¹³ most of the patients were observed from the age group between 40 – 60 years, 60 – 80 years and 20 – 40 years. (Fig.2)

The most common co-morbidity among the study population was found to be CVS disorder 26.04% which included 66 hypertensive patients. 14.6% were having endocrine disorders in which majority were having

Diabetes Mellitus. A similar finding was observed by Mohamed Hassan Elnaem et al.,¹⁴ in his study.

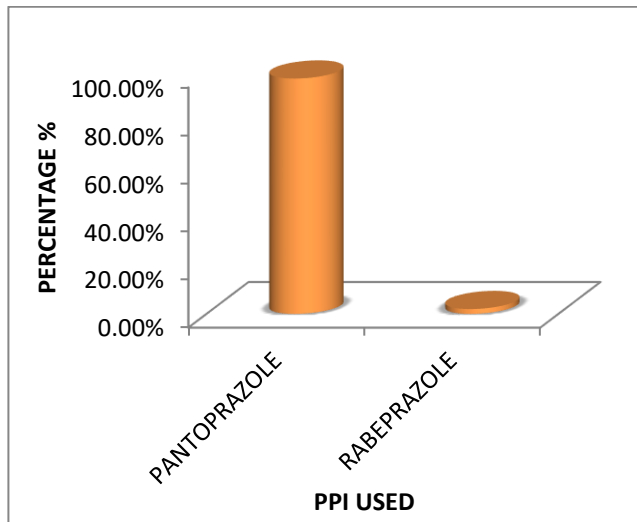


Figure 3: PPI Used

In our study, Pantoprazole was the most commonly prescribed PPI among the study population i.e. 97.97% followed by Rabeprazole 2.03%, in accordance to the study conducted by Saurav Khanal et al.,¹⁶ in which most of the patients were prescribed with Pantoprazole, followed by Rabeprazole. (Fig.3)

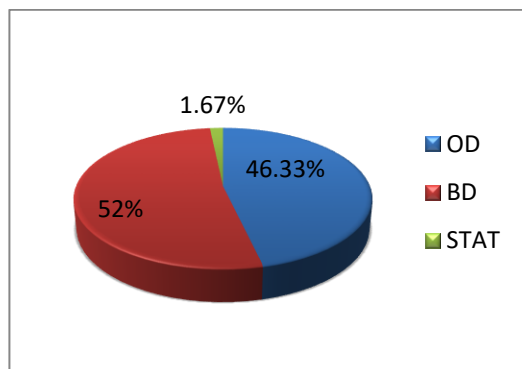


Figure 4: Frequency

Within the study population, 52% patients received PPI twice daily, followed by 46.33% received PPI once daily in contradiction to the study conducted by Niranjana Kunwar et al.¹⁷, where PPIs were more prescribed as OD than BD.(Fig.4)

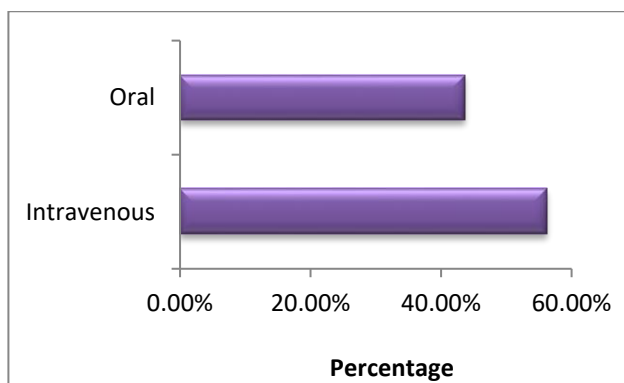


Figure 5: Route of administration

PPI treatment was given mostly as intravenous preparations, because patients in this study were treated as inpatients. 56.33% patients received PPIs by IV route followed by 43.67% oral route, similar to the study conducted by Saurav Khanal et al.,¹⁶ where IV route of administration was found to be the most common route of administration (Fig.5).

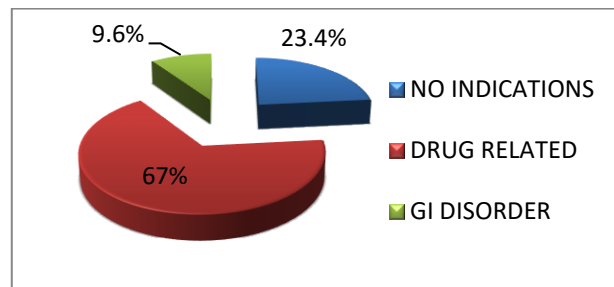


Figure 6: Indications

Our study shows that among the 300 patients, only 23.4% of PPIs prescribed for our patients had no relevant indications. For 9.6% patients PPIs were prescribed for GI disorders and in 67% PPIs were prescribed for drug related indications. This was consistent with the study conducted by Meutia Anindita et al.,¹⁵ in which the prevalence of PPI usage with appropriate indication was found in 77.78%.(Fig.6)

Use of PPI in patients with abdominal pain or vomiting was considered inappropriate unless the patient had another valid reason for PPI use¹². Out of 70 patients, 94.3% of PPIs were prescribed without any indication and 5.7% were prescribed for abdominal pain, nausea and bloody stools

Changeover Therapy

The ideal route of administration for any medication is one that achieves serum concentration sufficient to produce the desired effect without producing undesired effects. Patients are switched to oral (PO) therapy to continue treatment after an already adequate course of intravenous therapy being administered. It is not uncommon to convert a patient to oral therapy as part of initial treatment course.

Among the 300 patients, during hospitalization and discharge 48.7% patients had a change-over and 51.3% had no changeover. This result was not in coherence with a prospective study conducted by Shobha Churi et al.¹⁸ (Fig.7)

Among the 139 patients who had a change-over from IV PPI to Oral PPI, 95.65% were from IV Pantoprazole to Oral Pantoprazole followed by 3.55% which were from IV Pantoprazole to Oral Esomeprazole and only 1 patient had a change-over from IV Pantoprazole to Oral Rabeprazole.

Among the 47 patients who had a changeover during hospitalization, 91.6% had a change-over from IV Pantoprazole to Oral Pantoprazole. Among the 103

patients who had a change-over during discharge, 90.4% had a change-over from IV Pantoprazole to Oral Pantoprazole followed by 3.9% from IV Pantoprazole to Oral Ranitidine.

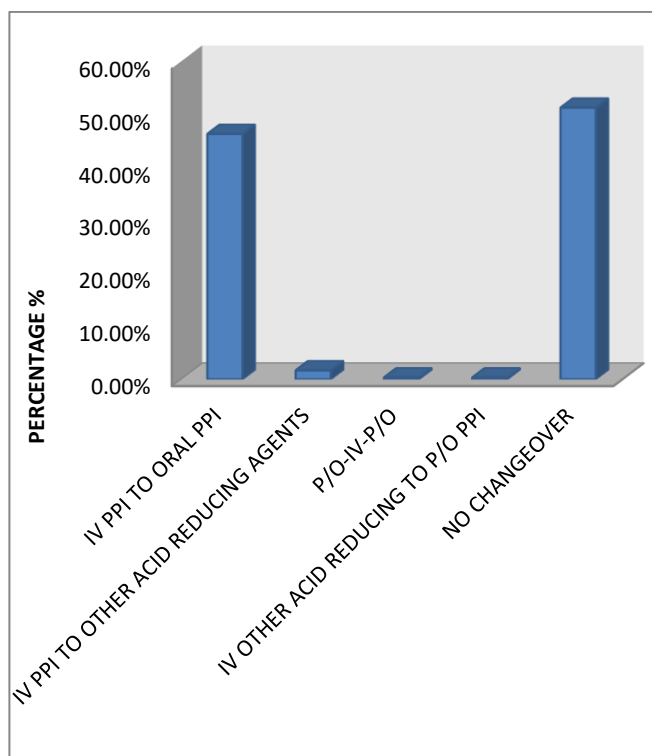


Figure 7: Changeover

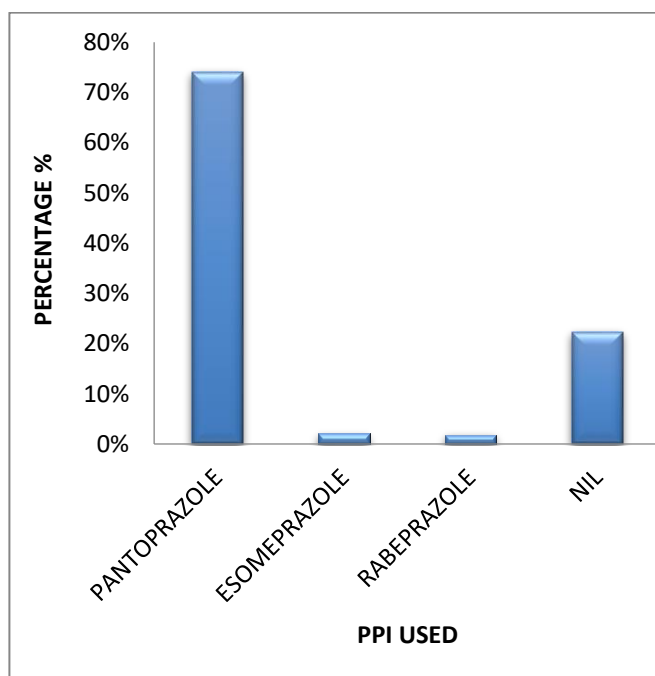


Figure 8: PPI after discharge

Our study shows that among the study population, 74% of patients were prescribed with Pantoprazole even after discharge and 22.3% were not prescribed with any PPIs. (Fig.8).

CONCLUSION

This large prospective observational study confirms that the majority of PPI prescription within the hospital comprise/consists of Pantoprazole. In our study about 70 patients (23.4%) were prescribed with PPIs without any valid indication which increased the patient therapeutic burden and their treatment cost. Monitoring and evaluating the long-term PPI use in the hospital setting should be performed for attaining a proper outcome and bringing down interaction and other possible issues related to PPI use. The knowledge of prescribing pattern can lead us towards the rational use of drugs and can help us in improving patients quality of life.

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