International Journal of Medical and Pharmaceutical Research

Online ISSN-2958-3683 | Print ISSN-2958-3675
Frequency: Bi-Monthly
Available online on: https://ijmpr.in/

Case Series

Decline in Peptic Ulcer Disease-Role of Overuse of PPI Needs Evaluation

Parveen Malhotra[1], Vani Malhotra[1], Pranav Malhotra[1], Rahul Siwach[1], Ankit Chahal[1], Avani Sharma[1]

[1]Department of Medical Gastroenterology, Obstetrics & Gynecology and Psychiatry, PGIMS, Rohtak, Haryana, India

OPEN ACCESS

Corresponding Author:

Parveen Malhotra
Department of Medical Gastroenterology, Obstetrics & Gynecology and Psychiatry, PGIMS, Rohtak, Haryana, India

Received: 28-04-2026
Accepted: 19-05-2026
Available online: 31-05-2026

ABSTRACT

Introduction- Proton Pump Inhibitors (PPI) like Pantoprazole, Omeprazole, Lansaprazole and Rabeprazole that decrease gastric acid secretion in stomach and are primarily used to treat gastroesophageal reflux disease, gastric and duodenal ulcers, and Zollinger-Ellison syndrome. Every speciality and super-speciality use PPI and in most of cases, it is overused and even where not indicated. Moreover, they are used for prolonged periods, despite being indicated for 4-8 weeks. It leads to side effects, of which common one headache, nausea, vomiting, diarrhea, constipation, pain in stomach or excessive gas formation, dizziness. The uncommon and serious side effects include severe allergic & skin reactions**,** renal and hepatic derangement. There can be no justification for overuse of PPI. In last 16 years of gastroenterology practice and being a high flow center where uptill now 33,000 endoscopies have been done, that to free of cost and without any waiting list. Moreover, all have been done single handed, thereby no misinterpretation of results can occur. There is strong decline, over last few years, in diagnosis of gastric and duodenal ulcers on endoscopy. It can be most likely attributed to overuse of PPI.

Case Series- On analysing 33,000 endoscopies done in last sixteen years at our center on yearly basis, we calculated prevalence on yearly basis of patient having gastric ulcers and duodenal ulcers. In first year, the prevalence of gastric ulcer was 4 % and duodenal ulcer was 3.5% and now in the sixteenth year, the prevalence has decreased substantially to 2.9% for gastric ulcer and 2.2% for duodenal ulcer. As expected, the decline is more prominent for duodenal ulcer. The age variation for endoscopic procedures was 10- 100 yrs with median of 52 yrs. Around 60 % were males and 40 % were females. The 62% patient belonged to rural area and 38% resided in urban areas. Moreover, with time, the percentage of dangerous peptic ulcers (Forrest classification Type 1) has declined and now majority of peptic ulcers are Forrest type 2 & 3 which requires less endoscopic treatment. It proves not only number of ulcers is decreasing but also their severity is decreasing.

Conclusion- PPI being a potent long-acting acid suppressor requires once daily dosage but its overuse and non-indicated prescription cannot be justified. No doubt, there are indirect evidences that its overuse in last few decades may have led to decrease in GU and DU but we have to work on decreasing risk factors for developing GU and DU. It includes, improvement in hygienic conditions, improvement in standard of living, dietary modifications for optimizing body mass index (BMI), and deceasing intake of alcohol and smoking.

Keywords*: Gastric ulcer, Duodenal ulcer, Proton-Pump inhibitors, Overuse, Pantaprazole.*

INTRODUCTION

Proton Pump Inhibitors (PPIs) are antisecretory agents that are used widely to diminish acid secretion and are used widely to manage many gastric acid-related conditions such as gastroesophageal disease, gastritis, esophagitis, Barrett's oesophagus, Zollinger-Ellison syndrome, peptic ulcer disease, nonsteroidal anti-inflammatory drug-associated ulcers, and *Helicobacter pylori* eradication, around the globe. **[1]** The overall rates of both gastric and duodenal ulcers are on a declining trend globally. Age-adjusted incidence and prevalence rates for Peptic Ulcer Disease (PUD) have dropped

significantly over the past few decades due to advancements in medical care, though absolute numbers continue to shift due to aging populations. The discovery of Helicobacter pylori and the widespread use of targeted antibiotic regimens have drastically reduced ulcer-causing infections. Proton Pump Inhibitors are potent acid-suppressing medications which effectively heal existing ulcers and prevent them from returning. The better living conditions has led to improved hygiene and sanitation which has led to better living conditions and has significantly lowered the transmission of H. pylori. Duodenal ulcers have experienced a steeper decline, leading to gastric ulcers becoming more common relative to duodenal ulcers in many regions. While ulcer trends from infections are dropping, cases tied to Non-Steroidal Anti-Inflammatory Drugs (NSAIDs) (e.g., ibuprofen, naproxen) and aspirin use are rising. These are primary drivers for gastric ulcers, particularly in aging and arthritic populations. While highly developed nations have seen dramatic drops, regions with lower socio-demographic indices—like South Asia—still hold the highest prevalence rates, driven largely by limited access to H. pylori screening and treatment. India is a developing country and thus still facing poor hygienic and living conditions in majority of residents, thus decrease in gastric ad duodenal ulcers cannot be selectively attributed to improved sanitation conditions. Moreover, Indian residents are still having strong risk factors for developing GU and DU, like obesity which is upward trend on similar lines of metabolic syndrome. Approximately 25-30% are having Metabolic disease associated steatotic liver disease (MASLD). The culture of eating fast foods with lots of spices and oil has increased in India which has substantially increased obesity percentage in children also. The sedentary life style in India has increased. All these factors directly or indirectly can cause increase in GU and DU but still their incidence and prevalence are decreasing. Hence, overuse of PPI leading to decrease in their prevalence should must be thought and considered.

CASE SERIES

On analysing 33,000 endoscopies done in last sixteen years at our center on yearly basis, we calculated prevalence on yearly basis of patient having gastric ulcers and duodenal ulcers. In first year, the prevalence of gastric ulcer was 4 % and duodenal ulcer was 3.5% and now in the sixteenth year, the prevalence has decreased substantially to 2.9% for gastric ulcer and 2.2% for duodenal ulcer. As expected, the decline is more prominent for duodenal ulcer. The age variation for endoscopic procedures was 10- 100 yrs with median of 52 yrs. Around 60 % were males and 40 % were females. The 62% patient belonged to rural area and 38% resided in urban areas. Moreover, with time, the percentage of dangerous peptic ulcers (Forrest classification Type 1) has declined and now majority of peptic ulcers are Forrest type 2 & 3 which requires less endoscopic treatment. It proves not only number of ulcers is decreasing but also their severity is decreasing.

DISCUSSION

PPI is a first-line treatment for acid-related disorders such as gastroesophageal reflux disease (GERD), peptic ulcers, and Zollinger-Ellison syndrome **[2]**. Its therapeutic effects are achieved by irreversibly blocking the H+/K+ ATPase enzymes in gastric parietal cells, resulting in sustained acid suppression **[3]**. Since its introduction in the late 1980s, it has become a cornerstone of acid-suppression therapy due to its superior efficacy and longer duration of action compared to histamine H2-receptor antagonists. This drug is formulated as a delayed-release capsule to protect it from stomach acid, ensuring optimal absorption in the small intestine **[4,5]**. The use of PPI has increased drastically in last few decades, making it reach in first ten drugs being prescribed in world. In majority of cases, it is being over and wrongly used. **[6-9]** Peptic ulcer disease (PUD) is characterized by disruptions in the gastrointestinal mucosa caused by gastric acid secretion or pepsin **[10]**. Most PUD cases are attributed to Helicobacter pylori (H. pylori)-associated PUD and nonsteroidal anti-inflammatory drug (NSAID)-associated PUD **[11]**. Over 90% of duodenal ulcers are closely linked to H. pylori infection **[12]**. The development of infection-related PUD is a complex process involving H. pylori infection, subsequent inflammation, and mucosal damage. Numerous studies have confirmed the negative impact of COX-1 inhibitors on the gastrointestinal tract, leading to damage in the stomach and small intestine. **[13]** Additionally, a retrospective meta-analysis by Ciociola et al. **[14]** found that approximately 27% of ulcer patients had neither H. pylori infection nor NSAID-induced ulcers, referred to as “idiopathic ulcers.” The occurrence of idiopathic ulcers is believed to result from the interaction of multiple pathogenic factors, including stress, hypersecretion of acid, and gastrinomas. **[15]** Contemporary issues, such as poor lifestyle habits, stress, and urbanization, are also closely related to PUD occurrence **[16]**, making it a significant challenge to control the burden of peptic ulcer disease. Reducing H. pylori infection and managing NSAID or aspirin use remain key strategies for lowering the risk of gastric and duodenal ulcers. **[17,18]** Hek K etal emphasized the need for continued focus on preventive measures and healthcare optimization to further reduce the global burden of gastrointestinal ulcers. The projected decline highlights the potential effectiveness of current strategies and offers a positive outlook for future management. **[19]** PPI are OTC (on the counter) drugs which are easily available to the patients without any prescription of medical practitioner. Many chemists in India also treat patients on their own and PPI are most common drug prescribed by them. Moreover, PPI are prescribed by wide range of doctors of different specialities, some of like cardiologist, Pain physicians and orthopaedician prescribe them with their anti-platelet and analgesic drugs, for counter-acting the side effects of their basic prescription. Hence, due to all the PPI are used, overused and sometimes unwarranted used in every kind of pain abdomen. This may have led to decrease in incidence and prevalence of Peptic ulcer disease because other risk factors in India for PUD still strongly persist.

CONFLICT OF INTEREST

None and no funding was taken for this case report.

CONCLUSION- PPI being a potent long-acting acid suppressor requires once daily dosage but its overuse and non-indicated prescription cannot be justified. No doubt, there are indirect evidences that its overuse in last few decades may have led to decrease in GU and DU but we have to work on decreasing risk factors for developing GU and DU. It includes, improvement in hygienic conditions, improvement in standard of living, dietary modifications for optimizing body mass index (BMI), and deceasing intake of alcohol and smoking.

REFERENCES

1. Maideen NMP. Adverse Effects Associated with Long-Term Use of Proton Pump Inhibitors. Chonnam Med J. 2023 May;59(2):115-127. doi: 10.4068/ cmj. 2023. 59.2.115. Epub 2023 May 25. PMID: 37303818; PMCID: PMC10248387
2. Shin, J. M., & Kim, N. (2013). Pharmacokinetics and pharmacodynamics of the proton pump inhibitors. World Journal of Gastroenterology, 19(42), 7256-7266.https://doi.org/10.3748/wjg.v19.i42.72562.
3. Andersson, T., Cederberg, C., Edvardsson, G., Heggelund, A., & Lundborg, P. (1990). Effect of omeprazole treatment on diazepam plasma levels in slow versus normal rapid metabolizers of omeprazole. Gut, 31(7), 799-806.
4. Walan, A., et al. (1989). Effect of omeprazole and ranitidine on ulcer healing and relapse rates in patients with benign gastric ulcer. New England Journal of Medicine, 320(2), 69-75.
5. Grandhi et. al., Am. J. Pharm Tech Res. 2025;15(04) ISSN: 2249-3387www.ajptr.com 1524. Pilbrant, Å., & Cederberg, C. (1985). Development of an oral formulation of omeprazole. Scandinavian Journal of Gastroenterology, 20(suppl 108), 113-120.5.
6. Savarino V, Dulbecco P, de Bortoli N, Ottonello A, Savarino E. The appropriate use of proton pump inhibitors (PPIs): need for a reappraisal. Eur J Intern Med. 2017; 37:19–24. doi: 10.1016/j.ejim.2016.10.007.
7. Al-Aly Z, Maddukuri G, Xie Y. Proton pump inhibitors and the kidney: implications of current evidence for clinical practice and when and how to deprescribe. Am J Kidney Dis. 2020; 75:497–507. doi: 10.1053/j.ajkd.2019.07.012
8. Nguyen PV, Tamaz R. Inappropriate prescription of proton pump inhibitors in a community setting. Can J Hosp Pharm. 2018; 71:267–271.
9. Sattayalertyanyong O, Thitilertdecha P, Auesomwang C. The inappropriate use of proton pump inhibitors during admission and after discharge: a prospective cross-sectional study. Int J Clin Pharm. 2020; 42:174–183. doi: 10.1007/s11096-019-00955-8.
10. Malik TF, Gnanapandithan K, Singh K. Peptic ulcer disease. Treasure Island: StatPearls Publishing; (2025).
11. Narayanan M, Reddy KM, Marsicano E. Peptic ulcer disease and Helicobacter pylori infection. Mo Med. (2018) 115:219–24.
12. Sverdén E, Agréus L, Dunn JM, Lagergren J. Peptic ulcer disease. BMJ. (2019) 367: l5495. doi: 10.1136/bmj. l5495
13. Bjarnason I, Scarpignato C, Holmgren E, Olszewski M, Rainsford KD, Lanas A. Mechanisms of damage to the gastrointestinal tract from nonsteroidal anti-inflammatory drugs. Gastroenterology. (2018) 154:500–14. doi: 10.1053/j.gastro.2017.10.049
14. Quan C, Talley NJ. Management of peptic ulcer disease not related To helicobacter pylori or NSAIDs. Am J Gastroenterol. (2002) 97:2950–61. doi: 10.1111/j.1572-0241.2002. 07068.x,
15. Spiro H. Peptic ulcer is not a disease, only a sign! —stress is a factor in more than a few dyspeptics. Psychosom Med. (2000) 62:186–7. doi: 10.1097/00006842-200003000-00004
16. Sugimoto M, Yamaoka Y. The association of vacA genotype and Helicobacter pylori-related disease in Latin American and African populations. Clin Microbiol Infect. (2009) 15:835–42. doi: 10.1111/j.1469-0691.2009. 02769.x,
17. Huang J-Q, Sridhar S, Hunt RH. Role of Helicobacter pylori infection and non-steroidal anti-inflammatory drugs in peptic-ulcer disease: a meta-analysis. Lancet. (2002) 359:14–22. doi: 10.1016/S0140-6736(02)07273-2, PMID:
18. Lanas A, Chan FK. Peptic ulcer disease. Lancet. (2017) 390:613–24. doi: 10.1016/S0140-6736(16)32404-7
19. He K, Ye S, Kou Y, Du S, Yuan W, Ge L, Tian Y, Luo B, Ha Y, Zhan L, Ye R, Huang Y, Li B, Nie B, Yang Y. Global trends and future predictions of gastrointestinal ulcers in youth. Front Public Health. 2025 Jul 18; 13:1511050. doi: 10.3389/fpubh.2025.1511050.