

# Inappropriate Use of H<sub>2</sub> Receptor Antagonists & PPIs in Geriatric Patients Admitted to Tertiary Hospital

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| Received: 11.01.2019 | Accepted: 21.01.2019 | Published: 30.01.2019

DOI: [10.36348/sjm.2019.v04i01.015](https://doi.org/10.36348/sjm.2019.v04i01.015)

## Abstract

**Introduction:** Since the introduction of H<sub>2</sub> blockers and PPIs they have become one of the most commonly prescribed classes of medications in the world. These drugs are often misused and overused, which may have significant implications in the elderly. **Aim:** To study prevalence of irrational use of H<sub>2</sub> blockers and PPIs in geriatric population. **Methods:** A retrospective study over six months period was conducted from February 2017 to August 2017 at a tertiary care hospital. The clinical data of total 137 patients admitted for one or more concurrent disease are included in the study. **Results:** In this study out of 137 patients, 102(74.4%) cases were on H<sub>2</sub> receptors antagonist and 34(24.8%) were on PPIs which were irrationally prescribed. Mean age of the patients was 68.9 ± 11.9 years. Out of 137 patients 103(75.1%) were male and 34(24.4%) female. Concurrent drugs prescribed were Antiplatelets 19(13.8%) cases, CCBs 12(10.4%), ferrous sulphate 13 (8.7%), steroids 10(7.2%), Digoxin 4(2.9%), Warfarin 2(1.4%), phenytoin 2 (2.9%). **Conclusion:** Irrational use of H<sub>2</sub> receptor antagonists and PPIs in elderly increased with advanced age, increase in number of medications, multiple diagnoses and increased length of hospitalization. Effects and interactions were commonly encountered in many cases. Acid suppression drugs are initiated or continued for prolonged periods of time, without sufficient evaluation of the need for therapy. Proper Guidelines for physicians and counseling for the patients is required in order to reduce overuse and to prevent long term adverse effects of the drugs.

**Keywords:** H<sub>2</sub> receptor antagonists, Proton pump inhibitors, Geriatric.

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## INTRODUCTION

Since the introduction of H<sub>2</sub> blockers and PPIs they have become one of the most commonly prescribed classes of medications in the world [1]. These drugs are often misused and overused, which may have significant implications in elderly [2]. While their long-term safety and efficacy have no doubt been proven over many years, they are not completely devoid of side effects – the most notable being an increased risk of pneumonia<sup>2</sup> and hip fractures which are major causes of mortality and morbidity in the elderly [3]. Through hypochlorhydria, PPIs may also interfere with absorption of drugs such as ketoconazole, ampicillin, iron, and digoxin. Hepatic cytochrome P450 can be inhibited by the earlier PPIs (omeprazole, lansoprazole). PPIs increased risk of toxicity, not only from the PPI itself, but also from the raised levels of potentially lethal drugs like warfarin and phenytoin. Similar to PPIs, H<sub>2</sub>-receptor antagonists are associated with similar side effects from acid suppression, such as a possible increased risk of pneumonia in hospitalized patients and interference with drug absorption [3]. Rare, reversible systemic toxicities reported with H<sub>2</sub>-receptor

antagonists include pancytopenia, neutropenia, anemia, and thrombocytopenia, with a prevalence rate varying from 0.01 to 0.2% [4]. Previous studies have reported mixed results regarding the use of histamine receptor antagonist use and cognitive function [5]. The interaction that occurs with theophylline and warfarin when the cytochrome P-450 enzyme system is inhibited by cimetidine and ranitidine requires monitoring [6]. The failure of clinicians to adhere to accepted guidelines on the use of acid suppressants likely arises from an underestimation of the potential dangerous side effects of these drugs.

### Aim of study

To study irrational use of H<sub>2</sub> receptor antagonists and PPIs in geriatric population.

## MATERIALS AND METHODS

This study was conducted at Dr Prabhakar kore's KLE Hospital and Medical research center Belgaum. It's a retrospective study of 6 months period from February 2017 to August 2017. 137 patients were included in the study, who were admitted to the

medicine wards. The detail history, examination, drug chart, investigations and treatment on discharge was recorded from the medical records. Basic routine investigation was done in all patients. USG abdomen and upper GI scopy was done in required patients. NICE Guidelines was used to exclude the patients on PPIs.

**Inclusion criteria**

- All patients > 60 years admitted to Medical wards for any disease.

**Exclusion criterias**

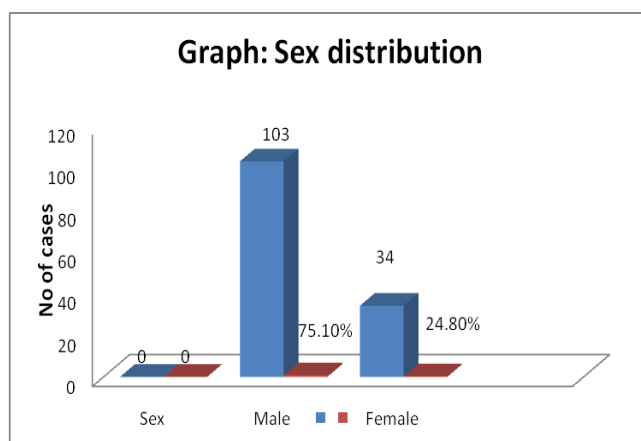
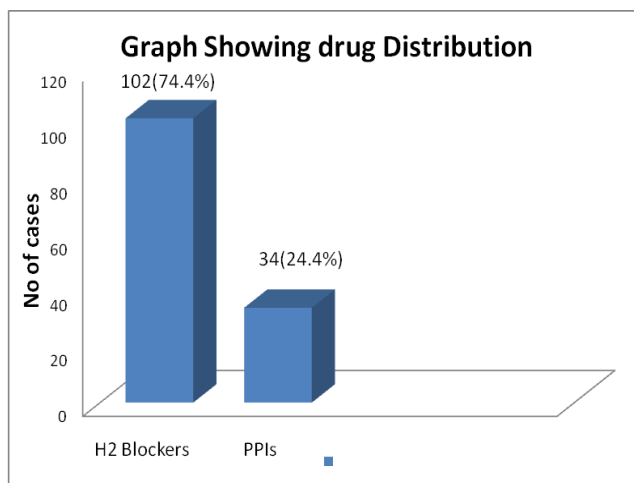
- History suggestive of Dyspepsia
- Acute gastric and duodenal ulcer
- Symptomatic GERD
- Erosive esophagitis
- Zollinger-Ellison syndrome
- NSAID-induced gastric ulcer prophylaxis
- NSAID-induced gastric ulcer
- Critically ill patient
- Patients already taking H2 Receptor antagonists and PPIs

**RESULTS**

In this study out of 137 patients, 102(74.4%) cases were on H2 receptors antagonist and 34(24.8%) were on PPIs which were irrationally prescribed. Mean age was 68.9 ±11.9 years. Out of 137 patients 103(75.1%) were males and 34(24.4%) females. Among 103(75.5%) cases, 92(90%) were taking oral H2 receptor antagonist and 10(9.8%) were on iv H2 receptor antagonist. 34(24.8%) patient were on oral PPIs and 3 (2.1%) on iv PPIs. One patient was put on both these group of drugs and 1 patient was on double PPIs.

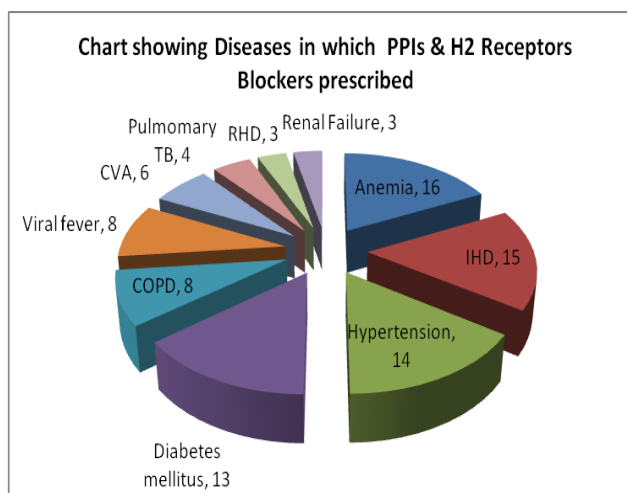
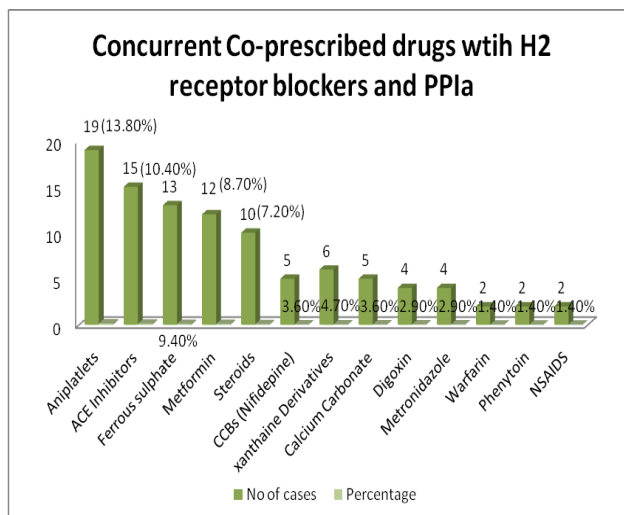
The most common condition where these drugs were prescribed were Anemia 16(11.5%) followed by IHD15(10.9%), Diabetes 13(9.4%), Hypertension 14(10.2%), viral fever 8(5.8%), COPD 8(5.8%), CVA 4(2.9%),RHD 3 (2.1%), renal failure 3(2.1%).

Concurrent drugs prescribed were Antiplatelets 19(13.8%), ACE inhibitors 15(10.4%), CCBs 12(10.4%), ferrous sulphate 13(8.7%), steroids10 (7.2%), Theophylline 6(4.7%), Calcium carbonate 5(3.%) Digoxin 4(2.9%), Metronidazole 4(2.9%), Warfarin 2(1.4%), phenytoin 2 (2.9%), and NSAIDS 2(2.9%).



**Table-1: Number of patients Distribution in different Diseases**

Diagnosis	No of cases	Percentages
Anemia	16	11.60%
IHD	15	10.80%
Hypertension	14	10.20%
Diabetes mellitus	13	9.40%
COPD	8	5.80%
Viral fever	8	5.80%
CVA	6	4.30%
Pulmonary TB	4	2.90%
RHD	3	2.10%
Renal Failure	3	2.10%
Other Conditions		



## DISCUSSION

In our study of patients admitted in the medicine wards of a tertiary care hospital serving mainly the rural population were receiving treatment with H2 receptor antagonists and PPIs at the time of admission. We observed seventy-five percent of patients on H2 receptors antagonists and twenty-five percent of patients on PPIs were inappropriately prescribed medications. In this study H2 receptor antagonist was more prescribed compared to PPIs because many patients had financial issues. PPIs were

frequently prescribed for non-dyspeptic symptoms in the community, and the prescription is generally continued for prolonged periods.

In a study from Gloucester, educational intervention was shown to reduce the practice of prescribing PPIs, an attempt to modify dyspepsia management in primary care in Greater Manchester suggested that educational outreach was more effective than passive guideline dissemination.

**Table-2: Concomitant Co-prescribed Drugs with H2 Receptors antagonists and PPIs**

DRUGS	No of cases	Percentage
Antiplatelets	19	13.80%
ACE Inhibitors	15	10.40%
Ferrous sulphate	13	9.40%
Metformin	12	8.70%
Steroids	10	7.20%
CCBs (Nifedipine)	5	3.60%
xanthenes Derivatives	6	4.70%
Calcium Carbonate	5	3.60%
Digoxin	4	2.90%
Metronidazole	4	2.90%
Warfarin	2	1.40%
Phenytoin	2	1.40%
NSAIDS	2	1.40%

Too often PPIs are prescribed as a harmless and relatively inexpensive remedy for any digestive problem or as essential protection against possible or theoretical drug related gastric problems which a patient has yet to encounter. Acid-suppressing drugs and anticoagulants are used increasingly in general practice. Some acid-suppressing drugs, notably cimetidine and omeprazole, through interference of the cytochrome P450 system, potentiate warfarin.

In our study it was found that PPIs were irrationally prescribed in 37(27%) cases and H2 receptor antagonist in 102(74.4%). Similarly in other study conducted in inpatients taking proton pump inhibitors in Australia [7], Ireland [8], and UK [9], 63%, 33%, and 67% of patients did not meet their country's criteria for taking the drug. In a series of hospital inpatients in Michigan USA, 20% of patients were taking a proton pump inhibitor on admission and another 40% were prescribed the drug during their hospital stay (mostly for prophylaxis). At discharge, half the patients were taking a proton pump inhibitor—more than double the number who were taking the drug when admitted [10]. In this study, 90% of patients did not need to take these drugs unless having gastro-esophageal reflux at some time in the past. A study from New Zealand [11-13] found that 40% of hospital inpatients were taking proton pump inhibitors inappropriately. Two thirds of these patients were still taking the drugs on discharge and most continued taking them for six months later. A prospective audit of a series of patients admitted as a medical emergency to a hospital in Wales<sup>13</sup> found that a quarter of patients were taking a proton pump inhibitor. Only half of the patients had appropriate indication for the drug. The audit was repeated six months after the NICE guidelines were disseminated to local practitioners. This repeat audit found that the same proportion of admitted patients were taking a proton pump inhibitor and again that only half of these had a recommended indication.

Among 137 patients in our study, 16(11.6%) had anemia. 8 (5.8%) had Dimorphic anemia and 8(5.8%) Iron deficiency anemia. In the previous study it

has been observed that long term treatment with PPIs is associated with cognitive impairment and vitamin B12 deficiency<sup>14</sup>. Researchers found that concurrent use of acid-suppression therapy for at least 12 months was associated with a significant increase in risk of vitamin B12 deficiency (OR 4.45; 95% CI, 1.47-13.34) [14]. Absorption of iron requires acidic media and by prescribing acid suppression drugs reduces iron absorption. In this study 13(9.4%) patients were co prescribed with H2 blocker. Digoxin 4(2.9%) was prescribed with PPIs. concurrent prescription of digoxin increases absorption and is associated with increase in digoxin levels and digoxin-associated toxicity [15].

Similarly warfarin metabolism is decreased by PPIs resulting in elevation of INR and risk of bleeding [15]. In this study we observed 2(1.4%) patients on Warfarin, 10(7.2%) on steroids, were prescribed with H2 receptor antagonists & PPIs for short-term durations, which was irrational. In previous studies mentioned, use of medication for prophylactic acid suppression in hospitalized patients in a non-critical care setting unless they have additional risk factors was found to be irrational. According to Beer's criteria 2012 Benzodiazepines should not be used, but in our study 2(1.4%) were on BZDs.

## CONCLUSION

This was a retrospective study and we need a large prospective study to find out the true incidence and correlation of the drugs and adverse outcome to formulate the guidelines. Irrational use of medication in elderly increases with advanced age, increase in number of medications, number of diagnoses and length of hospitalization. Effects and interactions are commonly encountered in many cases. Acid suppression drugs are initiated and continued for prolonged periods of time, without sufficient evaluation of the need for therapy. Proper Guidelines are required for physicians and counselling for the patients in order to avoid overuse and prevent long term adverse effects of these drugs.

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