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Assessment of Acid Suppressants Use in Hospitalized Patients

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AISHWARYA CHAKRABORTHY*, FARZAN KAMALIHAGHIGHISHIRAZI, MUHAMMED ZEEDAN NK, NISAR AHMED, MAHENDRA KUMAR BJ, SHAHID ASHRAFUL TALUKDAR

DEPARATMENT OF PHARMACY PRACTICE, FAROOQIA COLLEGE OF PHARMACY, TILAK NAGAR, MYSURU, KARNATAKA

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ABSTRACT

Most of the hospitalized patients are prescribed with acid suppressants several reports have suggested that acid suppressants are being overused in hospitalized patients. Inappropriate prescription can have a very negative effect. Clinician awareness on appropriate acid suppressants prescription will lead to better patient outcome at lower cost. **Objective:** To evaluate the usage of acid suppressants in hospitalized patients. **Methodology:** A prospective observational and interventional study was conducted in the inpatient wards of a tertiary care hospital over a period of 6 months. All necessary data were collected in a well-designed data collection form, from patients treatment chart and assessed. Necessary corrections or interventions were suggested. **Result: A total of 647 patients treatment chart were studied. It was identified that acid suppressants were prescribed between the age group of 1 month to 95 years old.** 330 were male and 317 were female. 511 (79%) patients were prescribed with acid suppressants, out of which 74 (14%) H2RA's. Among that 17 (23%) PO and 57 (77%) were IV. Around 427 (84%) PPI's were prescribed among that 62 (15%) PO and 365 (85%) were IV. Around 10 (2%) Antacids were prescribed. Around 472 (73%) prescriptions were rational (indicated/ required) and 175 (27%) prescriptions were not rational or irrational (not indicated/ not required) with respect to the use of acid suppressants. The average amount spent by hospitalized patients on acid suppressants was found to be 115.14 rupees. It was found the 133 (20%) prescriptions showed Not-mandatory (not indicated, but prescribed) and 42 (7%) prescriptions showed Unused (indicated, but not prescribed). Feedbacks from the PG doctors were obtained. **Conclusion:** "Assessment of Acid Suppressants use in Hospitalized patients" is the need of the hour topic. Our study suggested that the appropriateness of acid suppressants prescriptions in CSI hospital were the study was conducted is 73%. Use of acid suppressants should be individualized with respect to each patient's diagnosis, signs and symptoms and treatment to avoid irrationality, promote the rational use and avoid errors like not-mandatory use and non-use of acid suppressants.

INTRODUCTION

- A milestone in understanding the gastric physiology occurred in the 19th century when Camillo Golgi discovered that parietal cells were the source of acid secretions in the stomach. Parietal cell stimulation occurs as a response to humoral, neural, and paracrine release of various ligands including histamine, acetylcholine, and gastrin. When parietal cells are stimulated, the proton pump H+/K+ ATPase gets relocated from the cytoplasmic membrane to the canalicular membrane.

- Before the introduction of histamine 2 receptor antagonists (H2RAs), very little was available outside of acid neutralization compounds and anticholinergics. Surgery was considered the mainstay of therapy. Yet, with the development of H2RAs in the 1970s and proton pump inhibitors (PPIs) in the 1980s, pharmacologic therapy quickly became the mainstay of treatment2. The acid-peptic diseases are those disorders in which gastric acid and pepsin are necessary, but not sufficient due to pathogenic factors. The treatment and prevention of these acid-related disorders are accomplished by acid suppressant drugs which neutralize gastric acid and are used to treat ulcers. Acid Suppressant drugs are those drugs which neutralize gastric acid and are used to treat ulcer pain and heal the ulcer. The success of acid-suppressing agents in a variety of conditions is critically dependent upon their ability to keep intragastric pH above a certain target, generally pH 3 to 5; this target varies to some extent with the disease being treated. Drugs used to inhibit gastric acidity include proton pump inhibitors (PPIs), histamine H2 receptor antagonists (H2 blockers), and other antacid medications including bicarbonate containing preparations and preparations containing aluminum and magnesium along with agents with specific effects on prostaglandin synthesis. H2RAs are limited in their ability to inhibit postprandial gastric acid secretion and are ineffective in controlling reflux symptoms and healing esophagitis. In contrast to H2RAs, proton pump inhibitors block the final step of acid secretion, resulting in a profound and long-lasting acid suppression regardless of the stimulus.

- Clinical advantages or pearls of acid suppressants:

Antacids: Neutralize acid in the oesophagus, which can provide transient heartburn relief, do not significantly affect gastric pH or prevent subsequent heartburn episodes. Are not recommended as a primary therapy for frequent heartburn.

H2RAs: Competitively inhibit one source of stomach acid stimulation. Can be effective for infrequent heartburn as a single, isolated dose, but rapidly develop tolerance (reduced acid control) that is unresponsive to higher doses. Have an analgesic effect, which may provide heartburn relief while leaving the oesophagus exposed to acid.

PPIs: Block acid production at the final step (proton pump) for all sources of stimulation. Superior to H2RAs for control of gastric acid and treatment of frequent heartburn. Optimal PPI dose for empirical treatment of frequent heartburn is 20 mg. higher doses do not provide additional benefit for frequent heartburn.

- "Assessment of Acid Suppressants use in Hospitalized patients" is the need of the hour topic. Several reports have suggested that PPI's and H2RA are being overused in hospitalized patients. The appropriateness of PPI prescription in some hospitals is just 19%. GI prophylaxis for low risk patients is the leading indication accounting for maximum of non-compliant inhibitor prescription. Inappropriate prescription can have a very negative effect and it should be used only when all the acid suppressing agents have failed. In a developing country like India, where more than five hundred brands of PPI's and H2RA's are available. PPI should be used only when there is documented evidence of a GI disorder that cannot be treated with an H2-receptor antagonist, and where a PPI use is clinically justified. Increased Clinician awareness on appropriate PPI or H2RA prescription will lead to better patient outcome at lower cost.

METHODOLOGY

Study site: The study was conducted at all the wards of CSI Holdsworth Memorial (Mission) Hospital, Mysore which is a 320 bed tertiary care teaching hospital with different specialties and provides health care facilities to the people residing in and around Mysore district since 1906.

Study design: Prospective, Observational and Interventional study design.

Study period: The study was conducted over a period of 6 months from November 2018 to April 2019.

Ethical approval: This study was approved by the Institutional Ethics Committee of Farooqia College of Pharmacy, Mysore. (Annexure 5).

Study Procedure:

1. Preparation of data collection form

A specially designed data collection form (Annexure 1) was devised for the study. The data collection form had provision for collecting key information like demographic details (name, age, gender, family history, height, weight, body surface area), clinical data like (reason for admission, past medical history, diagnosis, comorbidities), treatment chart (name of the drug, dose, frequency, route, duration of administration.

2. Data collection and documentation

All relevant details of the patients were obtained from various data source and documented in the data collection form. If any change made in the in-patients drug therapy during the follow up, information was noted and the data was updated as appropriate.

3. Identification and Assessment of Rationality in prescription and the cost

Treatment chart and all the prescriptions were reviewed to identify the rational prescription of acid suppressants based on the past studies, standard guidelines and patients signs and symptoms. Cost was also calculated of each patient.

4. Computerization of data collection forms

The data collection and assessment form designed for use in this study was computerized using Microsoft access 2016 and Microsoft excel 2016 (annexure-2) for easy storage, accessibility, retrieval and analysis of data. We designed an app for easy entering of data (annexure-5). The android application was created to enter the data by mobile phone, this app ease the entering of the data and keep the data safe in the Google database by using Google data sheets as a database, it decreases the chances of missing the data due to electricity or internet disconnection or due to hardware problems. For designing the application the Platform which created by Massachusetts university was used, all the data entered by the use of application without any fail or error.

5. Providing the interventions

Using the assessed data, the interventions or the necessary correction was provided by the clinical pharmacists to the residents, whenever necessary.

RESULTS AND DISCUSSION

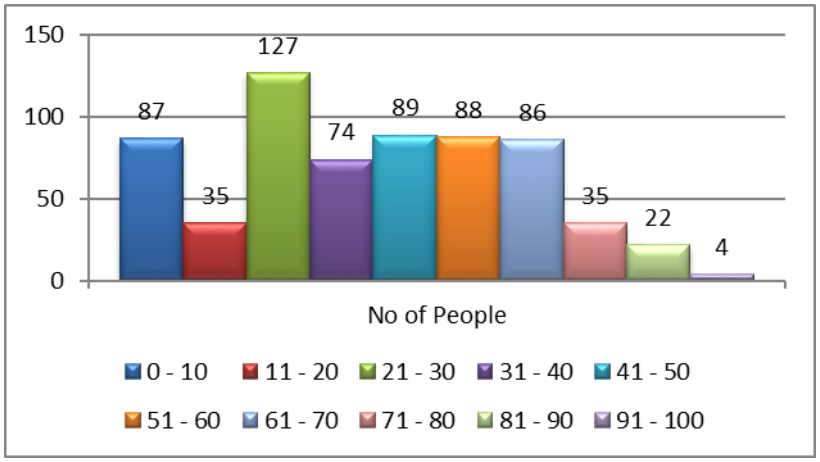
The present study was focused on identifying documenting, analyzing use of acid suppressants in hospitalized patients. The study conducted was a Prospective, Observational and Interventional study.

Cases were collected in random matter from all the wards of the hospital. We mainly focused on the prescribing pattern of Acid Suppressants (rational/ irrational).

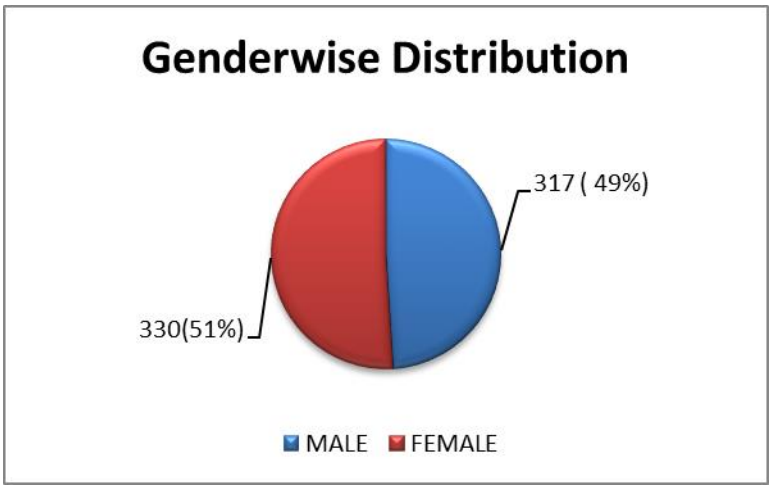
A total of 647 patient's case sheets were followed at CSI Holdsworth Memorial Mission Hospital for a period of six months; from Nov 2018- April 2019.

Majority of patients prescribed with acid suppressants were found in the age group of 21-30 (20%), followed by the age group of 41-50, 0.1-10, 51-60 (14%) and the least number of prescription of acid suppressants were found in the age group of 91-100 (0.6%).

Age range	No of People
0 - 10	87
11 - 20	35
21 - 30	127
31 - 40	74
41 - 50	89
51 - 60	88
61 - 70	86
71 - 80	35
81 - 90	22
91 - 100	4



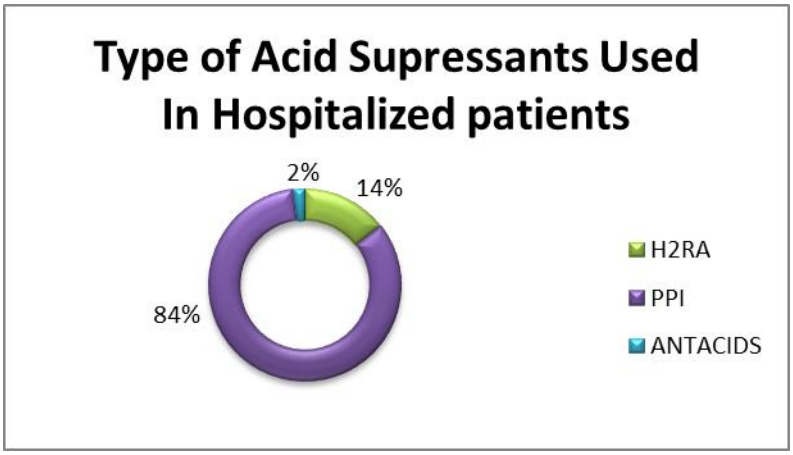
Acid suppressants were found to be prescribed slightly more in men (51%) than in women (49%).



Out of the total 647 patients that were followed, irrespective of rationality we found that 511 (79%) were prescribed with acid suppressants and 136 (21%) patients were not prescribed with any acid suppressants.

Prescription	No. of patients
With acid suppressants	511 (79%)
Without acid suppressants	136 (21%)

PPI's were found to be prescribed in majority of the prescriptions (84%), followed by H2RA's (14%) and antacids were prescribed in least number of prescriptions (2%).



Based on the literature review, patient's signs and symptoms, diagnosis and drugs administrated that is:

a) Literature review: Most of the articles that we read highlight that there is being an excessive use of ASD in non-critically ill patients and majority of non-critically ill patients do not require acid suppressants, like patients with fever, headache, ache and so on.

b) Signs and Symptoms like heartburn, dyspepsia, acid reflux, nausea, or regurgitation, bitter taste, discomfort in upper abdomen, or dry cough demand the use of acid suppressants.

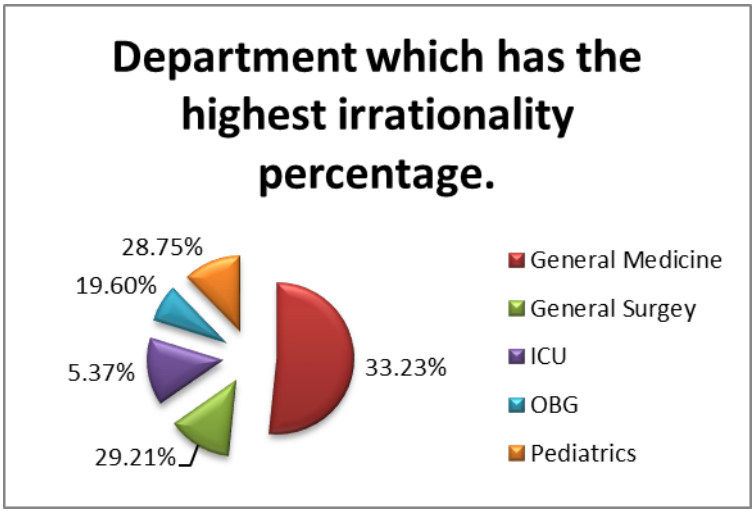
c) Diagnosis like GERD, Acute Gastritis. Critically ill patients, Zollinger-Ellison Syndrome, Patients on Mechanical Ventilation, History of GI ulcer, Shock, Respiratory Failure, Head trauma, Thermal Injury, Liver disease, Coagulopathy. Require the use of ASD.

d) Drugs Administered like High dose corticosteroids, High dose NSAID's, Anticoagulants and Antiplatelets.

We found out the total number of rational (the patients who were indicated or required the use of acid suppressants) were 73% and the total number of irrational (the patients who were not indicated or did not required the use of acid suppressants) was 27%.

Total no. of prescriptions	647
rational	irrational
472	175

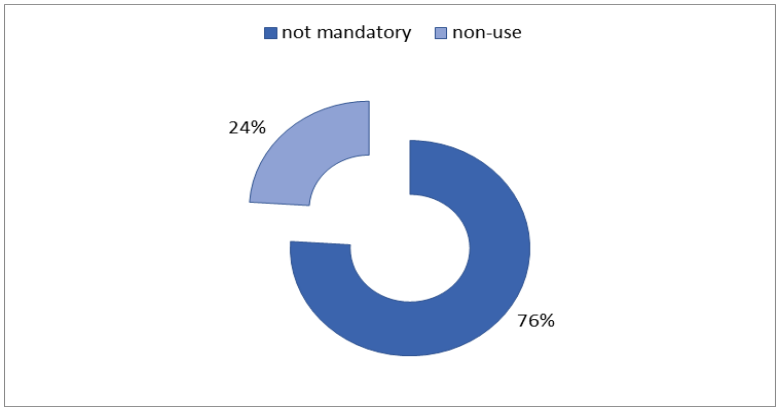
Department wise results showed that highest percentage of irrational prescriptions were found in the General Medicine department 33%, followed by General Surgery, Paediatrics, OBG and ICU being the least 6%.



The average amount of money spent on acid suppressants by hospitalized patients was found to be 115.14 rupees. The range of amount spent on acid suppressants by the hospitalized patients was found to be between 1.5 rupees to 838.8 rupees.

Cost range	No. of Patients
0-50	133
50-100	55
100-150	74
150-200	111
200-250	65
250-300	32
300-350	14
350-400	12
400-450	2
450-500	8
above 500	5

Among the total number of patients followed, it was found the 133 (20%) prescriptions showed an Not-mandatory (not indicated, but prescribed) of acid suppressants and 42 (7%) prescriptions showed an Unused (indicated, but not prescribed) of acid suppressants.



CONCLUSION

The appropriateness of acid suppressants prescriptions in the hospitals where the study was conducted is 73%. Inappropriate prescription can have a very negative effect; like not mandatory use of ASD's was seen in 133 patients and unutilized use ASD's was seen in 42 patients. The remaining 27% of the hospitalized patients were found to have an irrational use of acid suppressants and which leads to unnecessary financial burden on the patient. In a developing country like India, where more than five hundred bands of PPI's and H2RA's are available. PPI should be used only when there is documented evidence of a GI disorder that cannot be treated with an H2-receptor antagonist, and where a PPI use is clinically justified. Increased Clinician awareness on appropriate PPI or H2RA prescription will lead to better patient outcome at lower cost. The main highlight of our study is that use of acid suppressants should be individualized with respect to each patient's diagnosis, signs and symptoms and treatment to avoid irrationality, not-mandatory use and non-use of acid suppressant drugs.

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