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# EVALUATION OF USE OF ANTI-ULCER MEDICATIONS IN A TERTIARY CARE TEACHING HOSPITAL

M. Durga Bhavani*[1], P.Sudha[1], Sastha Ram V. Kishore[2], G. Divya[2], Diviti Ranganayakulu[3]

[1]Pharm D (PB) Intern, Department of Pharmacy Practice, Sri Padmavathi School of Pharmacy, Tiruchanoor, Tirupati

[2]Assistant professor, Department of Pharmacy Practice, Sri Padmavathi School of Pharmacy, Tiruchanoor, Tirupati.

[3]Principal, Department of Pharmacology, Sri Padmavathi School of Pharmacy, Tiruchanoor, Tirupati.

**Keywords:**

Gastric ulcers, Leaflets, orthodox drugs, Prospective Observational study

**For Correspondence:**

**M. Durga Bhavani**

Pharm D (PB) Intern, Department of Pharmacy Practice, Sri Padmavathi School of Pharmacy, Tiruchanoor, Tirupati

**E-mail:**

paddu.bhavani18@gmail.com

## ABSTRACT

**Background:**
Gastric ulcer is among the most serious gastrointestinal diseases in the world. There are several etiological factors which cause gastric ulcers & several orthodox drugs are employed for the treatment of the disease. Although these drugs are effective, their inappropriate use drags their effectiveness. Hence, this prospective observational study is carried out to evaluate the appropriate use of anti-ulcer medications.

**Objective:**
To evaluate and enhance the appropriate usage of anti-ulcer medications among inpatients in tertiary care teaching hospital.

**Method:**
A prospective observational study was conducted on the evaluation of use of anti-ulcer medications among the patients in a tertiary care teaching hospital during the period of March 2014 to September 2014.

**Results:**
A total of 350 cases were collected during our study period. In those, 282 prescriptions containing anti-ulcer medications and categorized them based on appropriate and inappropriate usage.The inappropriate use of anti-ulcer agents are more i.e., 60 patients (84.50%) than the appropriate use 11 patients (15.49%) during march to may& from June to September the appropriate use was more i.e., 202 patients (95.73%) than the inappropriate use by 9 patients (4.26%).

**Conclusion:**
The appropriate use of anti-ulcer agents has been enhanced by the end of the study period. Patients have been educated regarding the rational use of anti-ulcer medications through the patient information leaflets provided to them.

## INTRODUCTION

Proton pump inhibitors (PPIs) are one of the most commonly prescribed classes of medications[1,2] which is used to treat Gastro-oesophageal reflux disease (GORD), peptic ulcer disease, functional Dyspepsia[3,20] Prophylaxis is routinely provided for critically ill patients admitted to intensive care units (ICUs) who are at high risk for stress-related mucosal damage (SRMD)[8,15]. Proton pump inhibitors work effectively at reducing symptoms without many immediate side effects that would influence against patients from using them. Short term usage of PPIs reduce the formation of gastric acid in the stomach by inhibiting H+,K+-ATPase in parietal cells[13,21]. As gastric acid is essential for the release of vitamin B12 from food, PPI use may lead to vitamin B12 deficiency[7,18]. The chronic use of PPIs has been exposed to induce both short-term and long-term elevations in chromogranin A (CGA) [5,17]. Heartburn and acid regurgitation are common complaints in the pharmacy, where patients frequently seek relief through medication and advice[6,20]. The growing number of proton-pump inhibitors available in the over-the-counter setting provides an efficacious choice to patients experiencing frequent heartburn[15,16,19]. Pharmacists can assist patients in their treatment decisions at the same time as interested about alarm symptoms that should prompt a physician referral [6,7,25].

Due to lack of knowledge on how to use medicines, patients endures with other side effects which leads to an expensive clinical problem due to repeated utilisation of healthcare resources such as clinic visits, diagnostic tests and prescription medications[8,9,10]. It can also be a significant financial saddle on society through the cost of long-term reduced work efficiency and increased work malingering, Proton pump inhibitor therapy remains an important, expensive and safe intervention in patients with an appropriate indication[11,12,22]. However, overuse of the drug may expose patients to serious adverse effects and generate significant financial burden on the healthcare system[13,14,23]. Therefore, clinicians should make active efforts to minimise the redundant use of PPIs, warn patients about the potential adverse effects of PPI therapy, and identify and correct these Effects[4,25].Usually, most of the patients take the anti-ulcer medications after food due to lack of knowledge and / or due to ignorance, which is considered to be inappropriate usage of the medication. Although the drugs are effective, their inappropriate use drags their effectiveness. Hence, this prospective observational study is carried out to evaluate the effective and appropriate use of the anti-ulcer medications.

## METHODOLOGY

**Study Design:** Prospective Observational study

**Study Place:** Government General Hospital, Tirupathi.

**Study Duration:**March'14– September'14.

**Study Population**:350 patients

**Method:**

A specially designed proforma was used for collecting data which includes patient demographics, past medical history, past medication history, family and surgical history, co-morbidities, diagnosis and present medications prescribed for each patient. The data were obtained by direct patient interview and from patient case profiles.

All the prescriptions have been analyzed and evaluate the appropriateness of antiulcer drugs in the prescription. Data was analyzed for prescribing patterns of anti ulcer drugs, follow up, patient complaints (Adverse drug reactions and drug therapy problems).

The evaluation of use of anti-ulcer agents was done regarding:

- ✓ Age-wise distribution,
- ✓ Gender-wise distribution,
- ✓ Category-wise distribution,
- ✓ Route-wise distribution,
- ✓ Frequency-wise distribution,
- ✓ Duration-wise distribution,
- ✓ Dose-wise distribution,
- ✓ Dosage form wise distribution,
- ✓ Department-wise distribution,
- ✓ Month-wise distribution,
- ✓ Pre-counseling wise distribution,
- ✓ Post-counseling wise distribution,
- ✓ Appropriateness of prescription,
- ✓ Appropriateness of usage.

- By the above evaluation process, the status of appropriateness of prescribing and effective use of anti-ulcer medications has been assessed.

## RESULTS

A total of 350 cases were collected. In these 282 prescriptions contains Anti-ulcer drugs.

Table no.1 shows the gender wise distribution; in that 61%(173) were females & remaining 39% (109) were males.Inage-wise distribution, maximum number of patients were in the age group of 51-60 which was presented in table 2. According to the month-wise distribution, the enrollment of patients is more in the month of July shown in table 3.

Table 4 represents that Utilization of anti-ulcer agents is morein the general medicinedepartment when compared to the other departments. Proton pump inhibitors are mostly utilized than the other category of anti-ulcer medications correspond to table 5.Among the two drugs combinations, antacids + PPIs are utilized more when compared to the other two drugs combinations shows in table 6.

The three drugs combinations of $H_2$RBs + PPIs + antacids are utilized more when compared to the other three drugs combinations presented in table 7.By observing the dosage form-wise distribution, it has been noticed that, injection form of Pantoprazole is mostly administered when compared to the other dosage forms of Pantoprazole prescribed. In case of ranitidine, tablets are administered mostly than the other dosage forms.IV route of Pantoprazole is mostly utilized when compared to the other available routes of Pantoprazole. In case of ranitidine, oral route is mostly observed which represents table 8. Frequency of one time a day (od) of Pantoprazole is mostly observed when compared to the other frequencies. According to the above representation, ranitidine with frequency two times a day (bd) has been observed mostly when compared to the other frequencies which shown in Table 9. The appropriateness of anti-ulcer medications shows that majority of prescriptions containing anti-ulcer medication with indications when compared to that of without indications observed in table 10.The percentage of patients taking anti-ulcer agents before food during pre-counseling session is very less when compared to those who take anti-ulcer agents after food which indicates table 11.

Table 12 shows that the percentage of patients during the post-counseling session who take the anti-ulcer drugs before food is more than that of the patients who take the anti-ulcers after food.Percentage of prescribing mono therapy is higher when compared to the dual therapy and switchover of the anti-ulcer medications shows table 13.

**Table No. 1: Gender-wise distribution of patients**

| S.no | Gender | No. of Prescriptions(n=282) | Percentage (%) |
|---|---|---|---|
| 1. | Female | 173 | 61.34 |
| 2. | Male | 109 | 38.65 |

**Table no. 2: Age-wise distribution of patients.**

| S.no | Age (years) | No.of Prescriptions (n=282) | Percentage (%) |
|---|---|---|---|
| 1. | <10 | 10 | 3.54 |
| 2. | 11-20 | 29 | 10.28 |
| 3. | 21-30 | 31 | 10.99 |
| 4. | 31-40 | 39 | 13.82 |
| 5. | 41-50 | 51 | 18.08 |
| 6. | 51-60 | 58 | 20.56 |
| 7. | 61-70 | 44 | 15.60 |
| 8. | 71-80 | 17 | 6.02 |
| 9. | >80 | 3 | 1.06 |

**Table no. 3: Month-wise distribution of patients included in the study.**

| S.no | Month | No.of Prescriptions | Percentage (%) |
|---|---|---|---|
| 1. | March | 24 | 8.51 |
| 2. | April | 24 | 8.51 |
| 3. | May | 23 | 8.15 |
| 4. | June | 41 | 14.53 |
| 5. | July | 68 | 24.11 |
| 6. | August | 53 | 18.79 |
| 7. | September | 49 | 17.37 |

**Table no. 4: Utilization of anti-ulcer agents in various departments.**

| S.no | Department | No.of Prescriptions | Percentage (%) |
|---|---|---|---|
| 1. | General medicine | 186 | 65.95 |
| 2. | Surgery | 47 | 16.66 |
| 3. | Orthopedic | 17 | 6.02 |
| 4. | Dermatology | 14 | 4.96 |
| 5. | Pediatrics | 11 | 3.90 |
| 6. | ENT, Ophthalmology | 7 | 2.47 |

**Table no. 5: Category-wise distribution**

| S.No. | Category | No. of Prescriptions (n = 282) | Percentage (%) |
|---|---|---|---|
| 1. | Antacids | 8 | 2.83 |
| 2. | Histamine(H2) receptor blockers | 46 | 16.31 |
| 3. | Protonpump inhibitors | 153 | 54.25 |
| 4. | Switch over | 75 | 26.59 |

**Table no. 6: Switchover Wise Distribution**

| S.no | Switchover | Categories | No. of prescriptions (n = 75) | Percentage (%) |
|---|---|---|---|---|
| **1.** | **2 drugs** | PPI + H2RB's | 32 | 11.34 |
| | | PPI's + Antacids | 19 | 6.73 |
| | | PPI + ulcer protective | 8 | 2.83 |
| **2.** | **3 drugs** | PPI+Antacids+ulcer protective | 7 | 2.48 |
| | | PPI+H2RB's+Antacids | 9 | 3.19 |

**Table no. 7: Individual Dosage form-wise distribution**

| S.no | Prescribed drug | Dosage form | No.of prescriptions | Percentage(%) |
|---|---|---|---|---|
| 1. | Pantoprazole | Injection | 97 | 42.54 |
| | | Tablet | 83 | 36.40 |
| | | Switch over | 48 | 21.05 |
| 2. | Ranitidine | Injection | 26 | 29.88 |
| | | Tablet | 38 | 43.67 |
| | | Switch over | 23 | 26.43 |
| 3. | Gelusil | Syrup | 43 | 100 |
| 4. | Sucralfate | Syrup | 15 | 100 |

**Table no. 8: Drug Route-wise distribution**

| S.no | Prescribed drug | Route | No.of prescriptions | Percentage(%) |
|---|---|---|---|---|
| 1. | Pantoprazole | IV | 97 | 42.54 |
| | | P/O | 83 | 36.40 |
| | | Switch over | 48 | 21.05 |
| 2. | Ranitidine | IV | 26 | 29.88 |
| | | P/O | 38 | 43.67 |
| | | Switch over | 23 | 26.43 |
| 3. | Gelusil | P/O | 43 | 100 |
| 4. | Sucralfate | P/O | 15 | 100 |

**Table no. 9: Individual Drug Frequency-wise distribution**

| S.no | Prescribed drug | Route | No.of prescriptions | Percentage(%) |
|---|---|---|---|---|
| 1. | Pantoprazole | OD | 118 | 51.75 |
| | | BD | 57 | 25.00 |
| | | Switch over | 53 | 23.24 |
| 2. | Ranitidine | OD | 22 | 25.28 |
| | | BD | 48 | 55.17 |
| | | Switch over | 17 | 19.54 |
| 3. | Gelusil | TID | 43 | 100 |
| 4. | Sucralfate | TID | 15 | 100 |

**Table no. 10: Prescribing-wise distribution:**

| Type of prescription | No.of prescriptions (n=282) | Percentage(%) |
|---|---|---|
| Appropriate (with indication) | 206 | 73.07 |
| Inappropriate (without indication) | 76 | 26.95 |

**Table no. 11: Usage-wise distribution:**

| Appropriate usage | No. of prescriptions (n=282) | Percentage (%) |
|---|---|---|
| Ante-cibum | 213 | 75.53 |
| Post-cibum | 69 | 24.46 |

**Table no. 12: Counseling-wise distribution:**

| Counseling | Administration | No.of prescriptions | Percentage (%) |
|---|---|---|---|
| Pre-counseling | Ante-cibum | 60 | 84.50 |
| | Post-cibum | 11 | 15.49 |
| Post-counseling | Ante-cibum | 202 | 95.53 |
| | Post-cibum | 9 | 4.26 |

**Table No. 13: Therapy-Wise Distribution**

| S.No. | Therapy Provided | No. of Drugs |
|---|---|---|
| 1 | Mono Therapy | 282 |
| 2 | Dual Therapy | 5 |
| 3 | Switch Over | 71 |
| Total | | 358 |

**DISCUSSION**

The educational status play an important role in the health conditions among many factors, such as access to health system, level of information, and treatment comprehension in the socioeconomic characteristics. Our study demonstrates the inappropriate use of anti-ulcer medications among the inpatient population due to their lack of knowledge &/or ignorance towards the medication usage before counseling and a drastic change in the appropriate use of anti-ulcer medications after the information provided to them through the patient information leaflets & educating them through the counseling given to them(patients & their care takers).

This prospective observation study evaluated the usage of anti-ulcer medications and assessed the change from percentage of inappropriate usage of anti-ulcer agents to % of appropriate usage of anti-ulcer agents in the study period from March 2014 to September 2014.A total of 350 cases were collected. In these 282 prescriptions contains Anti-ulcer drugs. When gender-wise distribution is evaluated, females were more in the terms of anti-ulcer drugs usage than that of males which was similar to the Jameson et al., study.

While performing the evaluation of age-wise distribution, it has been revealed that patients of age-group 51-60 are using more anti-ulcer drugs this was contrast to Jameson et al., study. In month-wise distribution, it is observed that in the month of july, there is more usage of anti-ulcer drugs.In the department of general medicine, there is more utilization of anti-ulcer agents when compared to the other departments(inpatients wards).

In this study, the proton pump inhibitors are mostly utilized than the other category of anti-ulcer medications. Our evaluation study also shows that among the two drugs combinations, antacids + PPIs are utilized more when compared to the other two drugs combinations of anti-ulcer medications.The result also shows that the three drugs combinations of H2RBs + PPIs + antacids are utilized more when compared to the other three drugs combinations.

By observing the dosage form-wise distribution, it has been noticed that, injection form of pantoprazole is mostly administered when compared to the other dosage forms of pantoprazole prescribed. Ranitidine tablets forms are administered mostly than the other dosage forms.The IV route of pantoprazole is mostly utilized when compared to the other available routes of pantoprazole. In case of ranitidine, oral route is mostly observed.

Frequency of one time a day (od) of pantoprazole is mostly observed when compared to the other frequencies. According to the above representation, ranitidine with frequency two times a day (bd) has been observed mostly when compared to the other frequencies. The appropriateness of anti-ulcer medications shows the majority of prescriptions containing anti-

ulcer medication with indications when compared to that of without indications and the more percentage of patients taking anti-ulcer drugs before food when compared to that of taking medications after food. The percentage of patients taking anti-ulcer agents before food during pre-counseling session is very less when compared to those who take anti-ulcer agents after food.

It also shows that the percentage of patients during the post-counseling session who take the anti-ulcer drugs before food is more than that of the patients who take the anti-ulcers after food. This study aim was to promote the appropriate use of anti-ulcer medications that has to be taken before food, has been achieved, which is clearly demonstrated in the results as mentioned above.

## CONCLUSION

Prescribing pattern is towards generic anti-ulcer medications restricted to pantoprazole, ranitidine, gelusil and sucralfate alone.Anti-ulcer medications were partially prescribed in appropriately and the usage was earlier not taken at right time but after pharmacist intervention made after observation like provision of counseling, it became effective. Patients have been educated regarding the rational use of anti-ulcer medications through the patient information leaflets provided to them.Over-the-counter proton-pump inhibitors have a valuable role in the treatment of frequent heartburn. Pharmacists have the opportunity to guide patients through selection of the best treatment option for their symptoms.

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