

## A Descriptive Observational Study on Assessment of Prevalence, Risk Factors and Prescription Trends in the Management of Peptic Ulcer Disease

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### ABSTRACT

**Aim:** The present study was aimed to assess the prevalence, risk factors and the treatment pattern of peptic ulcer among the patients attending department of gastroenterology in a tertiary care hospital.

**Methods:** A descriptive observational study was carried out prospectively for a period of 6 months by assessing all peptic ulcer patients attending gastroenterology department by direct interview and also extracting relevant data from their computerized medical records and prescriptions. The data obtained from 52 patients were recorded in a pre-designed data collection form prepared for the same.

**Results:** This study showed that 50% of the peptic ulcer patients belong to the age group 21 – 40 years, with mean age of 41.45 and peptic ulcer disease (PUD) was more prevalent among males (80.77%) than females (19.23%). 25% of the participant had a habit of smoking which independently predict the development of PUD. 57.6% of patients received treatment with H. pylori kit, followed by Proton pump inhibitors (PPIs) treatment for 38.5%. Among PPIs esomeprazole was the more frequently prescribed drug and esomeprazole-based H. Pylori kit for eradication.

**Conclusion:** The prevalence of peptic ulcer among the entire patient attending for endoscopic examination was found to be 13.4%. Out of them 75% were duodenal ulcer patients and 57.70% were H. pylori infected. Thus, this study identified that the predominant reason for the development of peptic ulcer was H. Pylori infection, followed by smoking. Physician chooses esomeprazole more frequently than other PPIs due to its greater efficiency. But from the economic point of view it is not cheaper even when compared to other drugs belong to same class.

**Keywords:** Peptic ulcer, Prevalence, Risk factors, Treatment pattern

### INTRODUCTION

Peptic ulcer disease (PUD) is defined as disruption of the mucosal integrity of the stomach and or duodenum there by resulting in a defect or excavation occurring locally due to the presence of an active inflammation in which acid and pepsin plays major pathogenic role [1].

Even though gastric acid is still considered to be significant in ulcer formation, 70-90% of ulcer disease is due to infection of stomach by a bacterium *Helicobacter pyloridis* (H. pylori). Other risk factors include use of drugs like NSAIDs, corticosteroids, smoking, alcohol, diet, stress and past history of PUD [2].

Drugs used in the management of peptic ulcer include Proton pump inhibitors, Histamine receptor antagonists, Antacids, Gastro protective agents etc [3]. Management of H. pylori associated PUD has improved due to the wide spread use of Proton Pump Inhibitors (PPI) based triple therapy regimen for

H. pylori eradication or with other H. pylori eradication regimens which contain antimicrobial agents.

Time trends in peptic ulcer disease are of particular interest over the turn of the 21<sup>st</sup> century because of the developments relating to both risk factors and management. Studies around the world have shown that peptic ulcer is a multifactorial health problem affecting almost all population worldwide and considered as the major cause of mortality and morbidity.

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However, the treatment strategy employed in India scenario, especially in Kerala is not well studied. Hence this study aims to evaluate and assess the various factors that lead to PUD and also recent prescribing trends in peptic ulcer management. The results of this study will provide in depth knowledge and encourage us to educate the patient regarding various aspects of the disease, which may in turn enable the patient to cope better with the therapy and improve the outcome.

## MATERIALS AND METHODS

### Study design

A prospective study was carried out among the out patients of Gastroenterology department, a tertiary level referral hospital in Kerala, in order to evaluate the prescription pattern and to assess various risk factors associated with peptic ulcer disease. The study spanned over duration of 6 months, commencing from November 2015 to June 2016.

### Study population

All newly diagnosed peptic ulcer patients of both gender and patients with definitive diagnosis of PUD based on upper GI endoscopy who are willing to participate in the study were included in the study. Patients with associated secondary complications of PUD such as bleeding, perforation, gastric outlet obstruction and malignancy, patients treated surgically and immigrant patients were excluded from the study. As per the protocol approved by the Institutional ethical committee of hospital 52 patients were enrolled in this study.

### Study procedure

#### Phase I – Preparatory Phase

The study was approved by the Institutional Ethics Committee of KIMS AL SHIFA Hospital (IEC/KAS/2015/18 dated 17/11/2015).

Later formulated the criteria and the standards for the study, the nature, type or intention of the study was explained to the participants and given at least twenty-four hours to decide whether or not to participate. A written consent was obtained from the patients by providing them with the consent letters in the local language and a total of 52 patients with PUD were enrolled in to the study based on inclusion and exclusion criteria.

A data collection form was designed and developed, to collect all the relevant data from the patient regarding their demographic's details, co-morbidities, possible risk factors, endoscopy findings, medications given along with their dose and duration. Followed by this, follow up details and adverse drug reaction information if any, which has to be collected from the patient during subsequent visits to physician, were also added in the form. The participant information sheet was designed which helps to provide adequate information regarding this study and also about all the information that are been collected from the patient.

#### Phase II – Data collection Phase

##### Prospective data collection

After obtainment of the signed patient consent, data were collected from peptic ulcer disease patients attending gastroenterology OPDs using a pre designed data collection form. Sources of data are direct patient interview, computerised patients' medical records, family members/caregivers, interactions with the physician, patient's prescription and pharmacy bills.

##### Follow up

The follow up details includes present disease status, new or existing signs and symptoms if any, newer drugs prescribed if any and adverse reaction to the previously prescribed drugs if any exists or not, were usually collected during patients succeeding visits in the OPDs. If any patients were not available for collecting their follow up details, then their information were obtained through telephonic interview.

Patient information leaflets and Peptic ulcer Do's and Don'ts sheet are distributed among PUD patients as a part of this study, soon after data collection procedure to make them aware about their disease and life style modification needed to eliminate their diseases.

##### Alert card

An Alert card of ADR was designed by focusing specifically on drug induced ulcer patients (mainly NSAID induced ulcer cases).

#### Phase III – Analytical Phase

The data was entered in Microsoft access sheet for easy reference and analysis of the result were carried out later. The entire data was analyzed by using different statistical methods in consultation with a bio statistician.

##### Data evaluation

The data collected during the 6-month study period was analyzed for the base line characteristics like Prevalence of PUD among patients undergone endoscopic examination, Age wise distribution, Gender wise distribution, Assessment of clinical presentation, Co morbid conditions, Risk factor assessment, Laboratory investigations performed, Drugs used in the management of PUD and follow up status.

##### Statistical analysis

##### Determination of sample size for the project

As per the published report  $p = 91\%$  ( $p < 0.05$ ), and with a confidence interval of 98% and with an error of estimate (d) of 7.5%, the minimum sample size needed for this study was 52.

**Type of sample test proposed to be used for determining conclusion**

The collected data for the study were compiled and analyzed for drawing inferences employing statistical techniques. The tests used were “Chi - square test” ( $\chi^2$  test) for testing the independence of attributes or the homogeneity of proportion.

**RESULTS**

Result analysis of the data is summarized below:

**Age wise distribution:**

Among 52 patients, 13 patients were from the age group 21–30 years and another 13 patients were from the age group 31 – 40 years (**Figure1**). Mean age of the patient was found to be 41.65years and SD was 16.54 years.

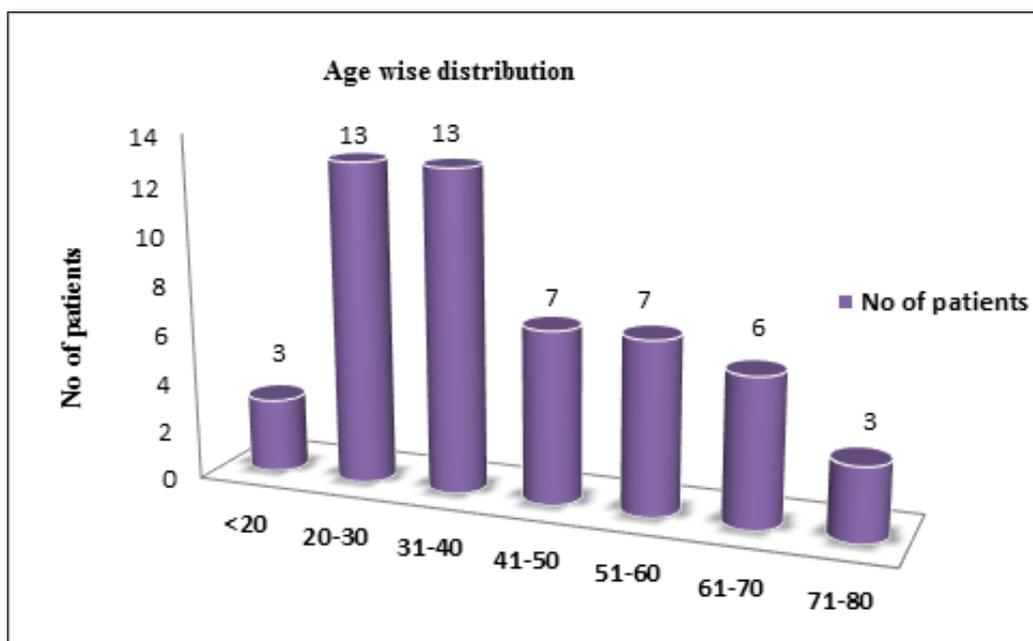


Figure 1. Age Wise Distribution graph.

**Gender wise distribution**

Out of a total of 52 patients, 42 patients were males and 10 were females (**Figure 2**). Males are found to be significantly higher than females in the sample ( $\chi^2 = 19.692, df = 1, p < 0.001$ ).

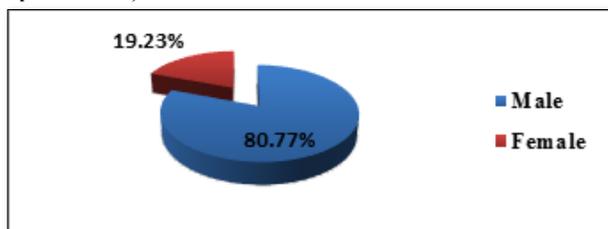


Figure 2. Gender Wise Distribution Graph.

**Presenting symptoms for performing endoscopy**

Among all the 52 samples of patients, 36 patients (69.23%) presented with abdominal pain. Followed by these upper abdominal symptoms are experienced by 17 patients (32.69%), 16 patients (30.76%) with pyrosis, another 16 (30.76%) with loss of appetite and 14 patients (26.90%) complaints about abdominal mass (**Figure 3**). Abdominal

pain had significantly high place for performing endoscopy ( $\chi^2 = 74.167, df = 12, p < 0.001$ ).

**Co-morbidities**

In between the 52 patients included for the study, Hypertension and Diabetes mellitus were the two significantly higher prevailing co-morbidities when compare to others (**Figure 4**). About 13 patients (25%) had hypertension and 10 patients (19.23%) suffered from diabetes mellitus ( $\chi^2 = 53.012, df = 8, p < 0.001$ ).

**Risk factors**

While analyzing the various risk factors associated with peptic ulcer disease, the following results were obtained:

**Food habits:** Non-vegetarians were significantly higher (92.30%) in number than vegetarians (**Figure 5**). ( $\chi^2 = 37.231, df = 1, p < 0.001$ ).

**Patients following proper food timing pattern:** Significantly higher number of patients (71.15%) in the sample does not follow any proper food timing pattern (**Figure 6**). ( $\chi^2 = 9.308, df = 1, p < 0.01$ ).

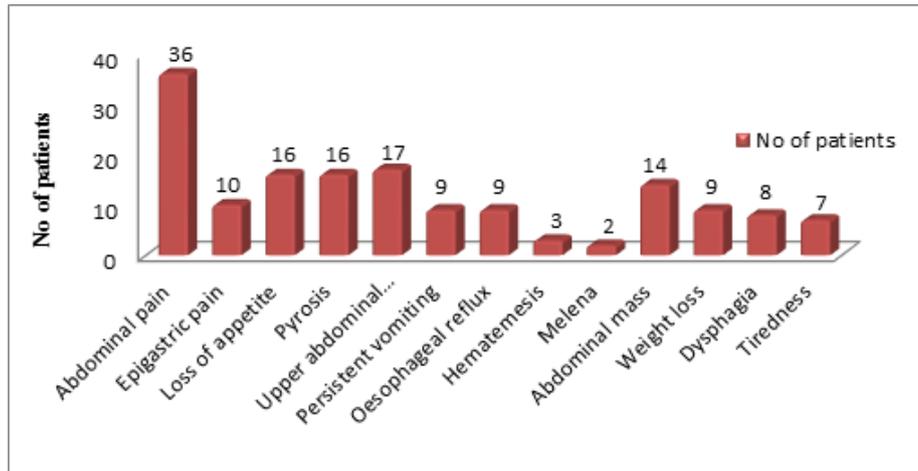


Figure 3. Clinical Symptoms of PUD Patients.

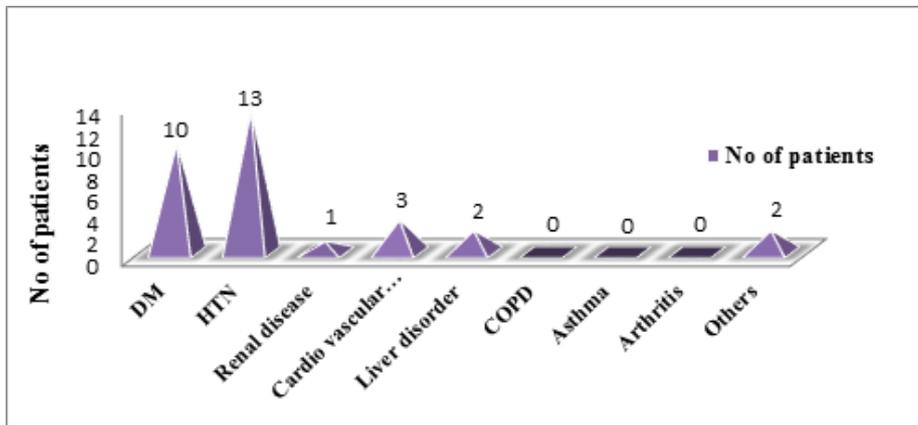


Figure 4. Co-morbidities.

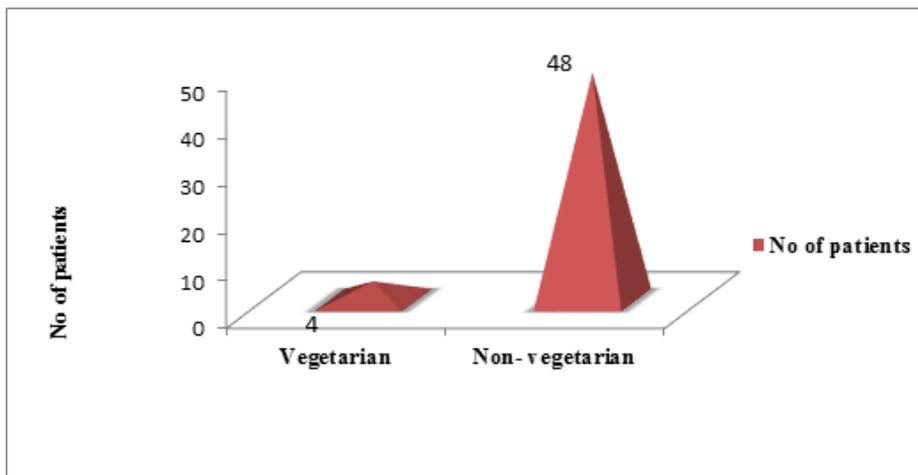


Figure 5. Food habits.

**Intake of spicy food:** Significantly higher number of patients (30 patients = 57.69%) in the sample consuming spicy food “often” followed by 16 patients (30.77%) taking “daily”. Only 11.54% eats spicy foods “rarely” (Figure 7).( $\chi^2 =$

16.802,  $df = 2, p < 0.001$ ).

**Personal habits:** Significantly higher numbers of patients (13 patients = 25%) in the sample had a habit of tobacco smoking

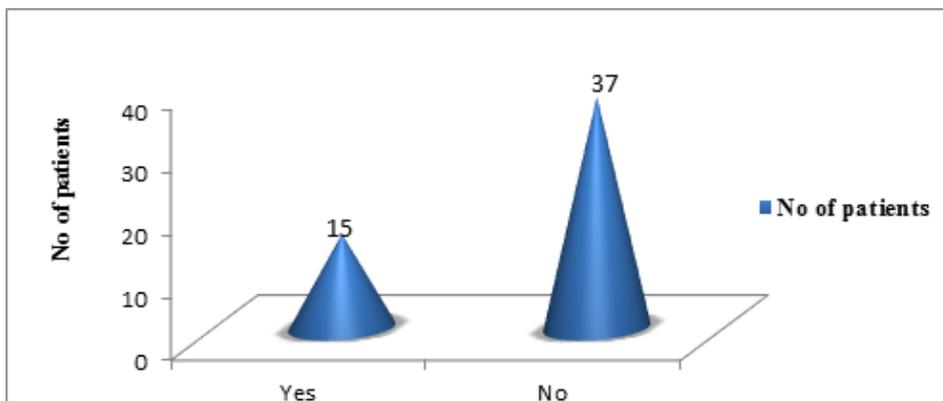


Figure 6. Patients following proper food timing pattern.

when compared to alcohol consumption (11.50%), and only 3.80% chew pan masala (Figure 8). ( $\chi^2 = 22.870, df = 4, p < 0.01$ ).

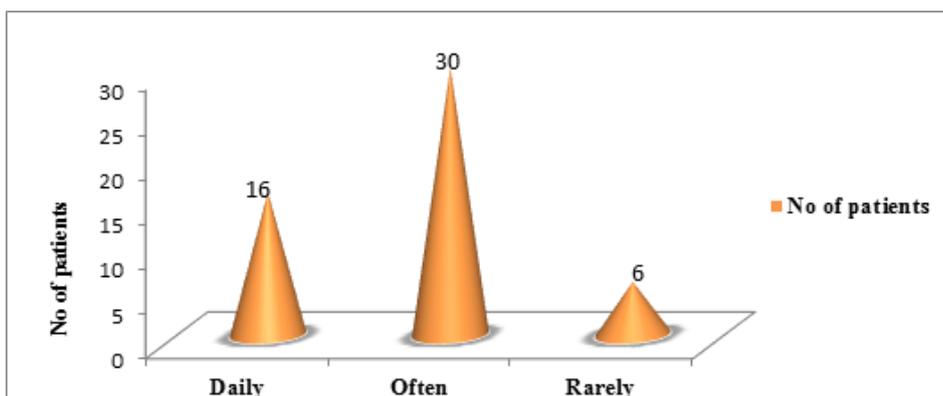


Figure 7. Intake of spicy food.

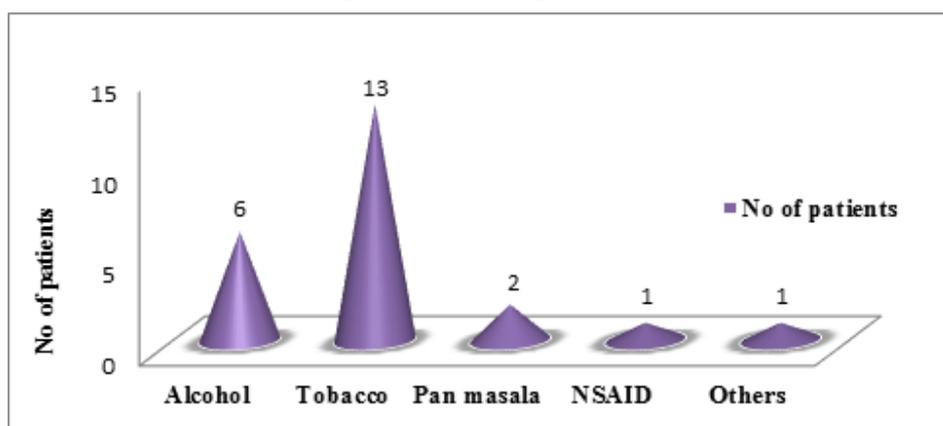


Figure 8. Personal habits.

**Stress:** Stress was not experienced by significantly higher number of patients. Only 13 patients (25%) reported with stress out of the 52 samples of patient (Figure 9). ( $\chi^2 = 13.000, df = 1, p < 0.01$ ).

**Investigations**

Out of all the 52 patients selected for the study, 39 patients (75%) were significantly diagnosed with duodenal ulcer, 11 (21.16%) with gastric ulcer, 1 (1.92%) with duodenal ulcer as

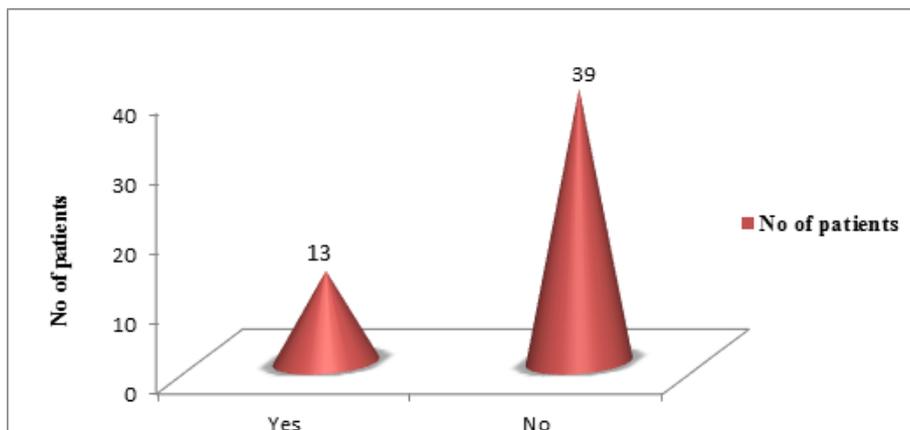


Figure 9. Stress.

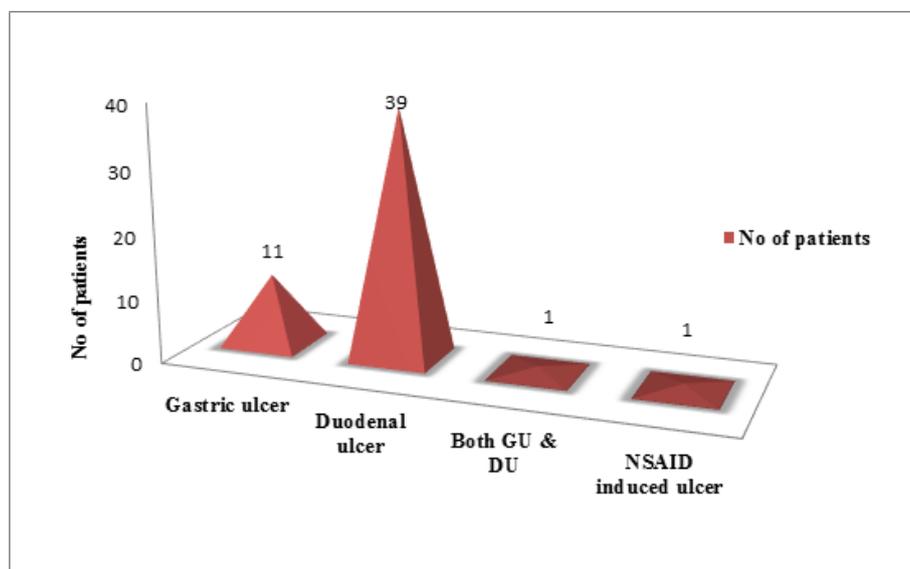


Figure 10. Endoscopic findings.

well as gastric ulcer and another 1 patient (1.92%) with NSAID induced ulcer (Figure 10). ( $\chi^2 = 74.462, df = 3, p < 0.001$ ).

**RUT:** No significant difference in the number of patients with positive and negative RUT could be detected from the sample observation (Figure 11) ( $\chi^2 = 1.231, df = 1, p < 0.05$ ).

**Treatment**

The results of medication given to the patients are shown in figure 19. Out of 52 patients, 30 patients (57.60%) were treated with H. pylori kit, 20 patients (38.50%) were prescribed with Proton pump inhibitors (PPI), 5 patients (9.60%) with histamine receptor antagonist and 2 (3.85%) patients treated with a combination of PPI and anti-emetic. Among different medications, significantly higher number of patients received H. pylori kit. ( $\chi^2 = 36.263, df = 3, p < 0.001$ ) (Figure 12).

Out of all PPIs, significantly higher number (13 patients) of patients in the sample were given esomeprazole (25%), 5 patients (9.60%) treated with pantoprazole and 3 patients (5.80%) were provided with omeprazole. Only one patient (1.92%) received rabeprazole for treating peptic ulcer (Figure 13). ( $\chi^2 = 19.964, df = 3, p < 0.001$ ).

**Follow up**

**Able to carry normal duties:** Significantly higher number of patients were able to perform normal duties after initial treatment (69.24%) (Figure 14). Only 16 patients (30.76%) found difficulty in carrying out their normal duties even after initial course of therapy due to new or existing symptoms of peptic ulcer. ( $\chi^2 = 7.692, df = 1, p < 0.01$ ).

**Existing or new symptoms:** Significantly higher number of patients (36 patients = 69.24%) has no new/existing symptoms. Only 16 patients (30.76%) out of total 52 patients, shown new / existing symptoms of peptic ulcer (Figure 15).

( $\chi^2 = 7.692, df = 1, p < 0.01$ ).

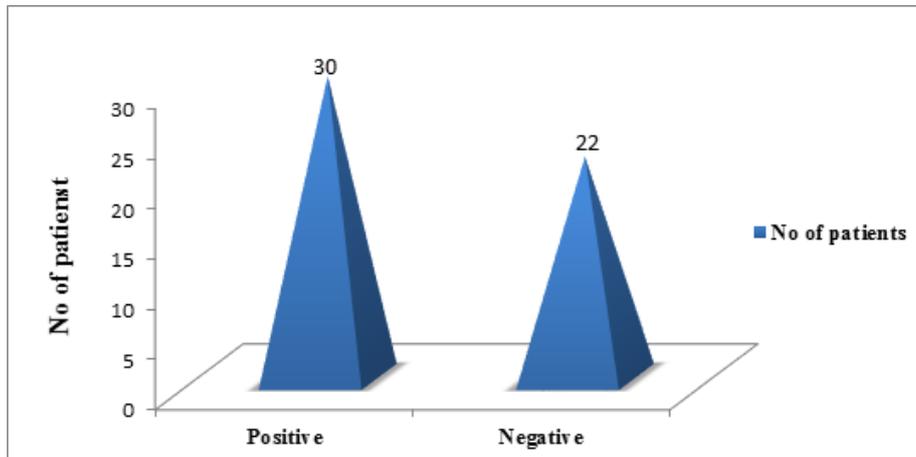


Figure 11. H. pylori status (RUT).

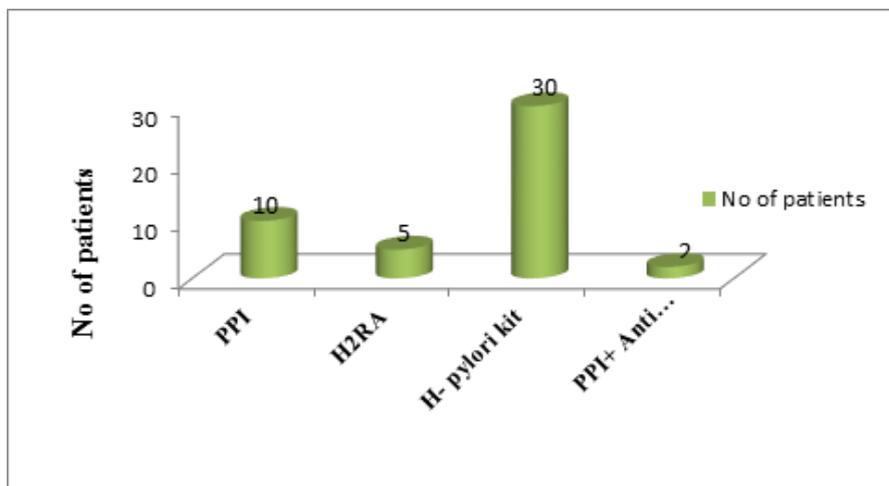


Figure 12. Medication given to the patients.

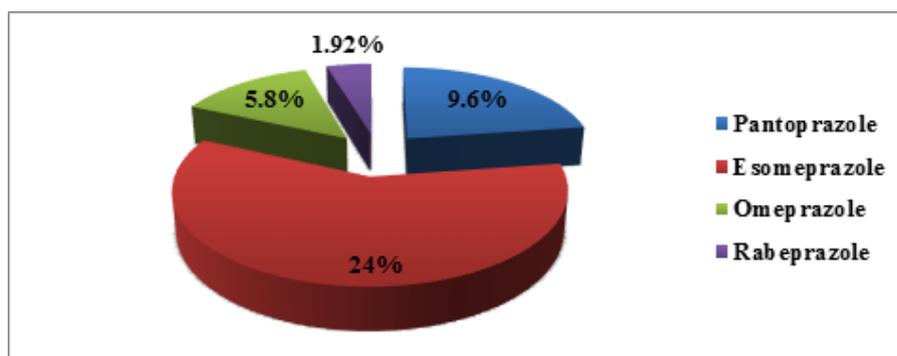


Figure 13. PPIs.

**Follow up treatment:** There was no statistically significant difference exists between the number of patients who received maintenance therapy and new PPI treatment (Figure 16). ( $\chi^2 = 0.040, df = 1, p > 0.05$ ).

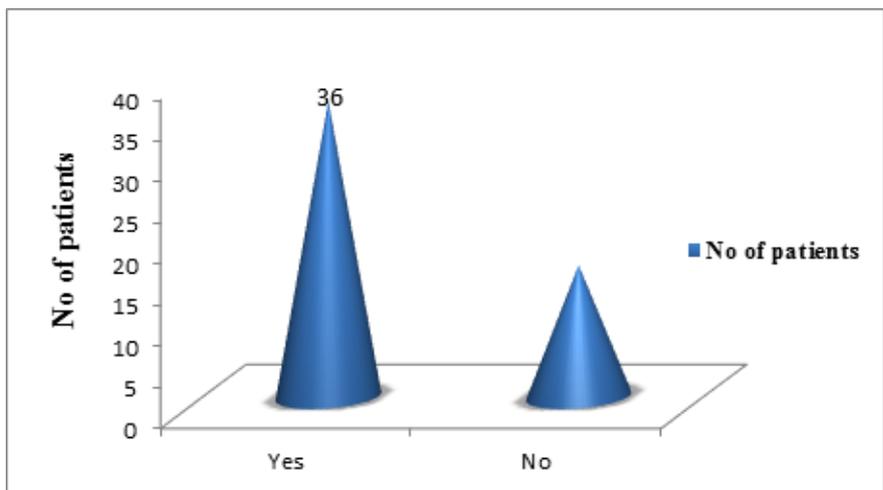


Figure 14. Patients able to carry out normal duties

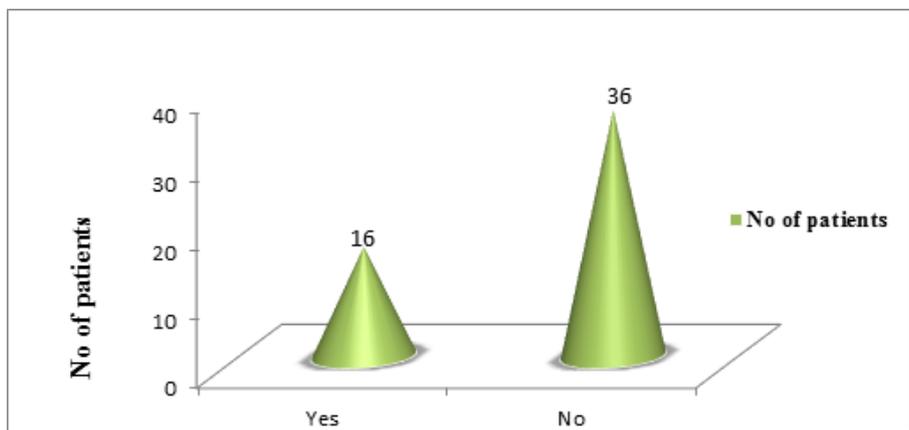


Figure 15. Existing or new symptoms.

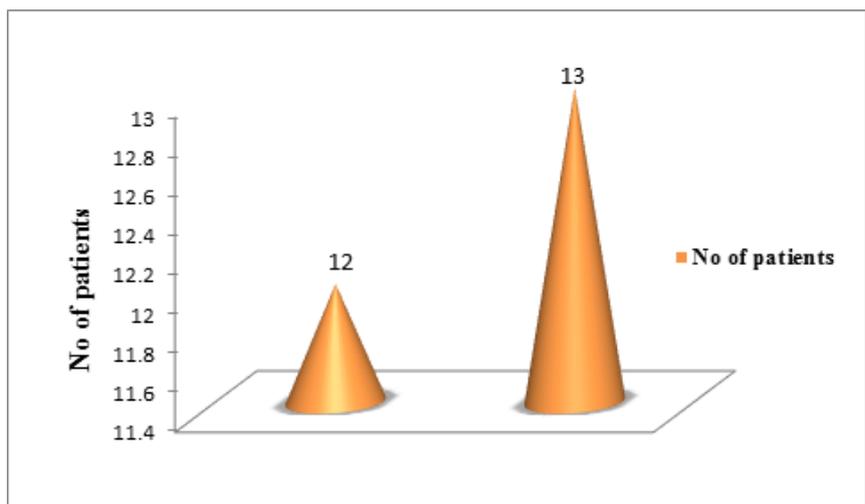


Figure 16. Follow up treatment.

**Newly prescribed drugs:** During follow up, significantly large numbers of patients were prescribed with PPI's compare to other class of drug. 21 patients (40.38%) were received new

dose of PPIs, 5 patients (9.60%) treated with H<sub>2</sub>RAs and 3 patients (5.80%) with combination of PPIs and Anti emetics (Figure 17)( $\chi^2 = 20.069, df = 2, p < 0.001$ ).

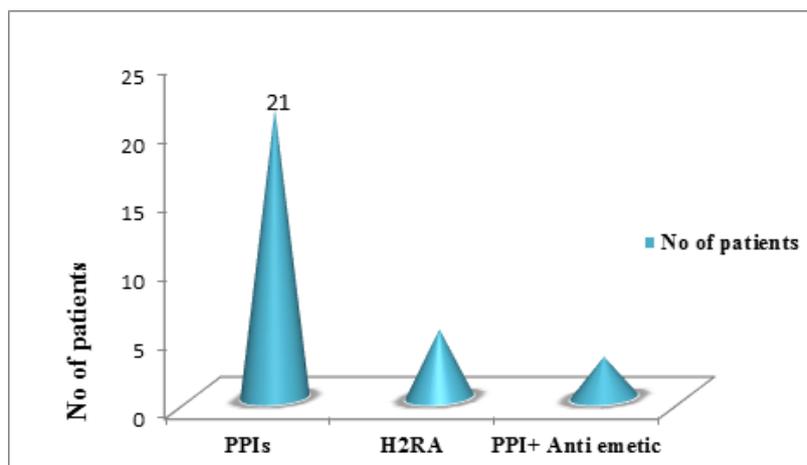


Figure 17. Newly prescribed drugs.

## DISCUSSION

This current study evaluated the prevalence of peptic ulcer among those patients undergone UGI endoscopic examination. Out of a total of 388 endoscopy patients, 52 cases were peptic ulcer. The study indicates that DU was more prevalent in our region. Thus, the total prevalence of PUD in endoscoped patients was 13.4%. This study is comparable with an endoscopic series study involving 1022 volunteers from Shanghai, China (average age 48 years). In their study the prevalence of PUD was found to be 17.2%, of whom 93% were infected with *H. pylori* [4].

In this present study the demographic characteristics showed that 50% of the peptic ulcer patients belong to the age group 21 – 40 years, 26.9% belongs to the age group 41 – 60 years, 11.5 % coming under age group 61 – 70 years and 3% each under less than 20 years and 71 – 80 year age groups respectively, with mean age of 41.45 and SD of 16.54 (mean age Mean  $\pm$  SD = 41.65  $\pm$  16.54). This result is exactly similar to the study conducted by Jonathan O. Kadiri et al, in Nigeria [5]. This study also reveals that PUD was more prevalent among males (80.77%) than females (19.23%). A study conducted by Dr. Rafi Abul Hasanath Siddique in Dhaka medical hospital, Bangladesh, has similar result [2]. In contrast, this is different from what some researcher got as their male to female ratio. A study conducted by Jonathan O. Kadiri et al, showed that females suffer more from PUD than males [5]. Peptic ulcer disease is a worldwide common disease, but the incidence of peptic ulcer disease in different countries and regions are obviously different. This may be the reason for variation in the ratio.

When we look at the co-morbidities, we found that more than half of the patients with PUD had an associated co-morbidity for which they would require treatment. 25% of the total respondents had hypertension and 19.23% with diabetes mellitus as co-morbid condition. According to a nationwide population-based cohort study conducted in Taiwan, diabetic

patients have a higher incidence of peptic ulcer disease. Age, chronic renal disease, history of PUD, and use of NSAIDs were risk factors for PUD in diabetic patients [6]. Certain life style factors such as consumption of tobacco, alcohol, tea, coffee and spicy foods are believed to stimulate gastric acid secretion.

According to a study conducted in Hawaii, the risk of both gastric and duodenal ulcers progressively increased with increased use of cigarette smoking [2]. In this study 25% of the participant was having a habit of smoking and found that alcohol consumption was less (11.50%) among them when compared to smoking. Other important cause for PUD is usage of NSAID's, but information regarding the history of NSAID usage was not obtainable from the medical records. Only 1 patient (1.92%) presented with the history of NSAID consumption and related ulcer incident in the OPD during this 6 month period. The current study revealed that only smoking independently predict the development of PUD. A Japanese study of men aged 45 years and older revealed that current smokers were at higher risk of both gastric (OR, 3.4, 95% CI: 2.4- 4.7) and duodenal ulcers (OR, 3.0, 95% CI: 1.9- 4.7), compared with nonsmokers. However, another study failed to confirm these findings for PUD risk in smokers compared with nonsmokers. Recent studies have suggested that tobacco smoking causes peptic ulcer only if *H. pylori* infection is present. A prospective cohort study in Denmark and another prospective study conducted by Fu-Wei Wang et al among general Taiwanese population showed that tobacco smoking remained an independent risk factor for PUD [7]. Hence, we believe that ulcer patients should be advised to cease smoking. Majority participants were free of stress (75%), only 25% had stress (psychological stress) which may lead to stress ulcer and it is not significant in nature.

Significantly higher number of patients suffers from duodenal ulcer in the sample. No statistically significant difference in the number of patients with positive and negative RUT could be detected from the sample observation. Even though the

number of peptic ulcer patients with positive RUT test were higher (57.70%) than RUT negative cases (42.30%). Which indicates that majority of the patients were *H. pylori* infected. Thus, this study concluded that the main risk factor of PUD were *H. pylori* infection and tobacco smoking. These findings have resemblance with the result obtained from a study conducted by S. Rosenstock et al, for identifying the risk factor for PUD among 2416 Danish adults [8].

In this study, while considering pharmacological therapy the most frequent anti-ulcer drugs prescribed as monotherapy and combination therapy belong to the class of PPIs (42.35%) and are no doubt effective agents, while H<sub>2</sub>RAs (9.60%) were the less frequently used anti-ulcer drugs as mono therapy as well as in combination therapy. This result was consistent with the study report of Jonathan O. Kadiri et al, in which they reported that PPIs were the most widely prescribed category of peptic ulcer medication [5]. This study was in contrast with a cross sectional retrospective study conducted by Ahmed Almeman et al., [9] which preferred H<sub>2</sub>RAs as anti-ulcer drugs. Although H<sub>2</sub>RAs are having a definite advantage over PPIs from the economic point of view, but physician choosing it only for treating very few patients. The PPIs are more superior to the H<sub>2</sub>RAs and thus in our study PPIs were more preferred than H<sub>2</sub>RAs. Gastric acid suppressant therapy in the form of an H<sub>2</sub> blocker or proton pump inhibitor for four weeks induces healing in most duodenal ulcers. Majority of guidelines and reviews recommend PPI as first line for eradication therapy in PUD [9]. A systematic review of randomized controlled trials by Vakil N et al, showed that proton pump inhibitors healed duodenal ulcers in more than 95 % of patients at four weeks and gastric ulcers in 80 to 90 percent of patients at eight weeks [10].

Even though Omeprazole is the traditional and more available cheaper PPI when compared to Esomeprazole, but in this study the physician chooses Esomeprazole due to its greater efficiency.

It was observed that most PUD patients with peptic *H. pylori* infection were started on a fixed combination of *H. pylori* kit. In this present study also Esomeprazole based HP kit was more commonly prescribed eradication regimen. In a meta-analysis conducted by McNichollet al, it was found that Esomeprazole was more efficacious in the eradication of *H. pylori* infection than the first generation proton pump inhibitors. This result was also consistent with the study conducted by Veeksha Jayaram et al., [1].

## CONCLUSION

This is the first observational study performed in our setting about Peptic ulcer disease; therefore, no previous results available from the public and/or private hospitals related to this study for comparison. From this study it is evident that the duodenal ulcer was more prevalent among the study population when compared to gastric ulcer. This study

identified that the predominant reason for the development of peptic ulcer was *H. Pylori* infection followed by smoking.

One of the major factors identified from this study is that majority of the patients and care givers were unaware about the role of *H. pylori* and smoking in the development of peptic ulcer disease. Thus, there is an evident need for making the patient and their care givers aware about their disease more clearly. In order to overcome this problem, we designed a clear, brief patient information leaflets and distributed among ulcer patients.

A detailed analysis of pharmacological agents used in PUD showed that PPIs were the most preferred drugs by physicians and among PPIs, esomeprazole was the predominant one. The treatment strategy practiced in India is primarily to start an empirical treatment for *Helicobacter pylori* eradication. But in our institution RUT test were performed in all patients along with endoscopy and choice of drug therapy is finalized based on RUT result. Need of conducting RUT test for all ulcer patients are questionable. It has added an extra unnecessary economic burden over the patients.

The current guidelines strongly recommend eradication therapy for *H. pylori* in all patients with duodenal or gastric ulcers, which will result in cure for over 90% of these patients, so that treatment is cost-effective as well as clinically beneficial. Eradication also decreases the need for continued treatment and PUD recurrence. A comparison between H<sub>2</sub>RAs and PPIs and making a choice between them are quite difficult task. The inclusion of proton pump inhibitors with appropriate antibiotics has proven to maintain high eradication rates. Shorter courses of therapy with fixed combinations of *H. pylori* kits can improve compliance and decrease treatment failures. However the implication of such widespread use of antibiotics on antibiotic resistance needs to be borne in mind.

## CONFLICTS OF INTEREST

The authors have none to declare.

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