

**PREVALENCE OF GASTROESOPHAGEAL REFLUX DISEASE AND COMPARING THE EFFICACY OF DIFFERENT PROTON PUMP INHIBITORS FOR SYMPTOMATIC RELIEF BASED ON ENDOSCOPIC FINDINGS IN A TERTIARY CARE HOSPITAL**

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ABSTRACT

Gastro Esophageal Reflux Disease (GERD) is a condition that occurs when the refluxed stomach contents lead to troublesome symptoms and complications. Prevalence of GERD differs in various geographical regions. Factors such as smoking, alcohol consumption, certain medications and foods have a significant effect on the aggravation of the disease. A prospective observational study was conducted between August 2015 & January 2016 in department of Gastroenterology, Gandhi hospital, Secunderabad after approval from Institutional Ethical Committee, CMRCP. Cases included according to study criteria. A total of 2460 subjects participated, out of which 130 subjects were found to be affected with GERD. Data obtained from cases were analyzed to obtain final outcome by statistical analysis using ANOVA. The prevalence of GERD in males was 58.46%. 70.77% of the patients belonged to the age group of below 50 years. Alcoholism 36.93%, smoking 42.31%, tea consumption twice daily (47.69%), meat consumption 72.31% are the factors that aggravate disease. 99 patients who presented for second endoscopy were compared to know the efficacy of each proton pump inhibitors (Pantoprazole, Rabeprazole and Esomeprazole) considered in this study. Rabeprazole showing 37.81% symptomatic relief followed by esomeprazole 35.37% and pantoprazole 26.82%. several factors such as change in the diet, lifestyle, smoking and alcohol consumption can affect the prevalence of GERD in this rapidly progressing society. The prescribed proton pump inhibitors are well tolerated with Rabeprazole showing better efficacy than Esomeprazole and Pantoprazole for the relief of esophageal lesions and GERD related symptoms.

Key words: GERD, Prevalence, Endoscopy, PPIs.

INTRODUCTION

Gastroesophageal reflux disease (GERD) is a condition that occurs when the refluxed stomach contents lead to troublesome symptoms and complications. The key factor in the development of GERD is associated with defective lower esophageal sphincter (LES) pressure or function^[1]. GERD occurs in people of all ages but is most common in those

older than age 40 years. GERD symptoms may have a significant impact on quality of life. The prevalence of GERD varies depending on the geographic region. Family history, older age, sex, race obesity, smoking, alcohol consumption, certain medications and foods, higher socioeconomic status, increased BMI, use of Nonsteroidal anti-inflammatory medications, high meat consumptions, smoking, large fatty diet and shorter dinner to bed time to be significant risk

factors.^{[2][3]} Life style factors associated are stress, major life events and alcoholism; residents in rural area having a positive family history are associated with a higher risk of GERD^[4]. The severity of GERD is directly correlated with the degree and duration of esophageal acid exposure. Chronic exposure results in esophageal stricture in 4%-20% of patients and Barrett's esophagus in up to 15% of patients with GERD. Symptoms include Heartburn, Acid brash (hypersalivation), Regurgitation/belching, Chestpain, Dysphagia(common), Odynophagia, Bleeding, Weight loss, Esophagitis/Strictures, Barrett's esophagus, Esophageal adenocarcinoma, Dental enamel erosion⁽⁵⁾. Clinical history is Generally sufficient to diagnose GERD in patients with typical symptoms. Endoscopy is preferred for assessing for mucosal injury and for other complications. Los Angeles Classification of Esophagitis is based on endoscopy report.

Los Angeles classification of Esophagitis⁽⁶⁾.

Type	Description
A	One (or more) mucosal break 5 mm or less that does not extend between the tops of two mucosal folds
B	One (or more) mucosal break more than 5 mm-long that does not extend between the tops of two mucosal folds
C	One (or more) mucosal break that is continuous between the tops of two or more mucosal folds but that involves less than 75% of the circumference
D	One (or more) mucosal break that involves at least 75% of the esophageal circumference

Pharmacologic treatment consists of Patient-directed therapy with nonprescription antacids, H₂-receptor antagonists, or proton pump inhibitor. The proton pump inhibitors are all benzimidazole derivatives that control gastric acid secretion by inhibition of gastric H⁺ k⁺-ATPase, the enzyme responsible for the final step in gastric acid secretion from the parietal cell. These drugs are weak bases. Under these acidic conditions the prodrugs are converted to their active form, which irreversibly binds the proton pump, inhibiting acid secretion. The different proton pump inhibitors (omeprazole, esomeprazole, lansoprazole, pantoprazole and rabeprazole) bind to different sites on the proton pump, which explain their differences in potency on a milligram per milligram basis. All proton pump inhibitors are most effective if taken about 30 minutes before a meal as they inhibit only actively secreting proton pump activity. The optimal

dosing time is 30-60 minutes before the first meal of the day. Patients with severe esophagitis should continue long term proton pump inhibitor therapy. It is recommended that the least expensive appropriate proton pump inhibitor should be used^[8]. PPIs are more effective than standard-dose H₂RA and placebo in symptom relief and endoscopic healing of GERD. Efficacy is similar for currently available PPIs^[9]. The proton pump inhibitors are usually well tolerated; however potential adverse effects include diarrhoea, headaches and abdominal pain, constipation and nausea. Which resolve on drug discontinuation^[10]. Proton pump inhibitors are superior to H₂-receptor antagonists both in their ability to control symptoms and to heal esophagitis in patients with GERD. They are also more cost effective in treatment with severe disease^[11]. Symptom relief was achieved in 77% of patients on proton pump inhibitors. Both healing and symptom relief occurred almost twice as fast when a proton pump inhibitor is used. Even with mild esophagitis (grade 1 or 2)^[12].

Methods:

A prospective case observational study was conducted between August 2015 & January 2016 in department of Gastroenterology, Gandhi hospital, Secunderabad. Permission for the study was obtained from Institutional Ethical Committee, CMR College of Pharmacy and also from the Hospital. Cases were collected and documented in a structured documentation form from outpatient department of Gastroenterology in a regular manner according to inclusion criteria, which includes; Patients with GERD (who are confirmed through endoscopy) of age group more than 18 years and patients on proton pump inhibitor therapy. Study exclusion criteria includes; Pediatrics patients, pregnant women, Upper GI cancer patients, chronic kidney disease patients. A total of 130 cases were collected during the study period. Cases were analyzed in a regular manner to obtain interpreted data and further analyzed statistically to get the final result.

Statistics:

Interpreted data obtained from cases were statistically analyzed by using 'Windostat 9.2' software. Analysis of variance test (ANOVA) and Paired-t were performed to analyze the data of various parameters to obtain the statistical significance of each parameter.

RESULTS

A total of 2460 subjects participated in the study from August 2015 to January 2016, out of which 130 subjects were found to be affected with GERD and

therefore showing a prevalence of 5.2%.
During this period, 130 GERD cases were collected,

documented and analysed. The following results were
obtained:

Table 1: Age and Gender wise distribution of GERD patients (n=130)

Age Distribution		Number (%)
1.	Below 50 years	92 (70.77)
2.	Above 50 years	48 (29.23)
Gender Distribution		Number (%)
1.	Male	76 (58.46)
2.	Female	54 (41.54)

Demographic characteristics of patients are shown in **Table 1**. About 76% of them are male and mostly belong to the age group below 50 years.

Table 2: Distribution of subjects according to their lifestyle and dietary habits.

Lifestyle and Dietary habits	Number (%)
1. Alcoholics	48 (36.93)
2. Smokers	55 (42.31)
3. Tea consumption	121 (93.07)
4. Meat intake	94 (72.30)

Distribution of subjects according to Alcohol consumption (n= 130), Smoking (n=130), Tea consumption (n= 130) and Meat intake (n= 130). Table 2 demonstrates that majority are Tea consumption (93.07%), followed by meat intake (72.30%), smokers (42.31%) and alcoholics (36.93%).

Table 3: Distribution of Heart Burn, Regurgitation and other symptoms among subjects:

Symptoms	Number (%)
1. Heart Burn	111 (85.38)
2. Regurgitation	110 (84.61)
3. Presence of chest pain	96 (73.84)
4. Presence of Dysphagia	94 (72.30)
5. Abdominal Pain	91 (70)

Distribution of subjects according to Heart burn (n= 130), Regurgitation (n=130), Presence of chest pain (n= 130), Presence of Dysphagia(n= 130) and Abdominal pain (n=130). Table 3 demonstrates that majority of patients have heartburn (85.38%), regurgitation (84.61%) followed by chest pain (73.84%), dysphagia (94%) and abdominal Pain (91%).

Table 4: Classification of subjects into various stages of GERD according to Los angeles classification based on endoscopic findings: (n= 130)

GERD STAGE	Number (%)
A	37 (28.46)
B	51 (39.23)
C	42 (32.31)
D	0

Table 4. Shows classification of subjects into various stages of GERD according to Los angeles classification. Subjects with GERD stage A were 37 (28.47%), B stage were 51 (39.23%), C stage were 42(32.30) and no persons with stage D.

Table 5: Drugs prescribed to patients with different stages of GERD (n= 130)

Endoscopic Esophagitis Grade	Pantoprazole Number (%)	Esomeprazole Number (%)	Rabeprazole Number (%)
A	25 (19.23)	12 (9.23)	0
B	18 (13.84)	21 (16.15)	12 (9.23)
C	0	14 (10.76)	28 (21.53)
D	0	0	0
Total	43 (33.08)	47 (36.15)	40 (30.77)

Table 5. Shows Drugs prescribed to patients with different stages of GERD. Stage A patients prescribed with Pantoprazole were 25 (19.23%), stage B patients with Pantoprazole were 18 (13.34%) and stage C patients were nil. Stage A patients prescribed with Rabeprazole were nil, stage B patients with Rabeprazole were 12 (9.23%) and stage C patients with Rabeprazole were 28 (21.53%). Stage A patients prescribed with Esomeprazole were 12 (9.23%), stage B patients with Esomeprazole were 21 (16.15%) and stage C patients were 14 (10.76%).

Table 6: Number of patients who got symptomatic relief for each drug: (n=82)*

Drugs	Number (%)
Pantoprazole	22 (26.82)
Rabeprazole	31 (37.81)
Esomeprazole	29 (35.37)
Total	82(100)

*Patients who got symptomatic relief out of 99 second endoscopy patients (only 99 cases are were considered because of 2nd endoscopy report)

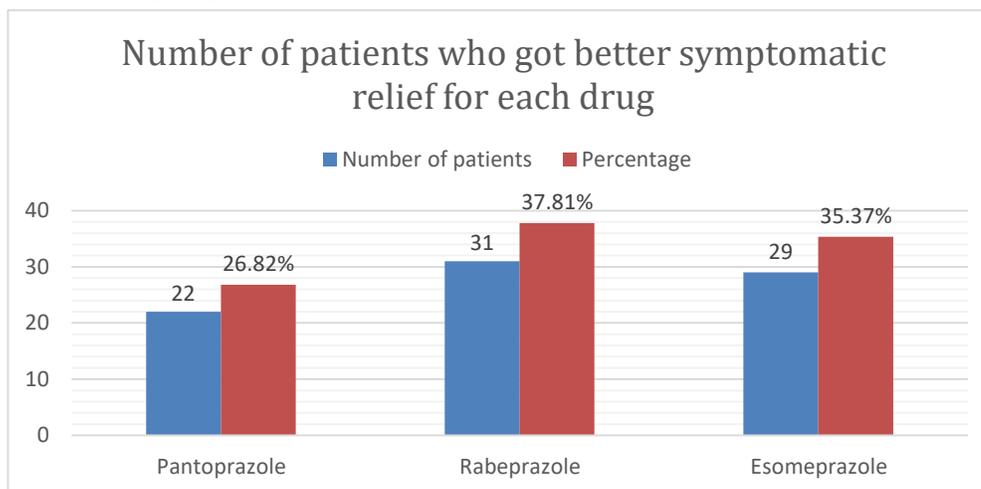


Fig 1. Number of patients who got better symptomatic relief for each drug

Table 6. demonstrates symptomatic relief was mostly observed with Rabeprazole treated patients 37.81% followed by Esomeprazole 35.37% and Pantoprazole 26.82%. Fig 1.

Table 7: Number of patients in whom relief was not observed for each drug: (n=17)*

Drugs	Number (%)
Pantoprazole	11 (64.72)
Rabeprazole	2 (11.76)
Esomeprazole	4 (23.52)

*Patients in whom relief was not observed out of 99 second endoscopy patients.

Table 7. Shows number of patients in whom relief was not observed was high in Pantoprazole treated patients 64.72% followed by Esomeprazole 23.52% and Rabeprazole 11.76% .

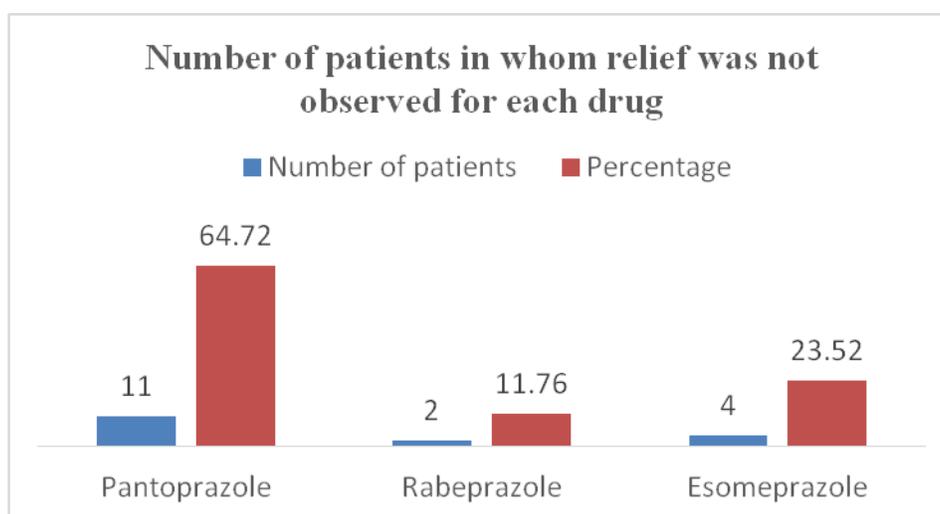


Fig 2. Number of patients in whom relief was not observed for each drug

Table 8. Effect of Drugs on patients before and after second endoscopy

Drugs (before and after second endoscopy)	Mean difference	P value
Pantoprazole	0.879	P < 0.001**
Rabeprazole	0.795	P < 0.001**
Esomeprazole	0.663	P < 0.001**

Statistical analysis result have shown that the drugs ($p < 0.001$) have high on grades of disease.

DISCUSSION

GERD is considered to be a health problem of the western countries but it is becoming prevalent in India due to modifications of diet and lifestyle.

Collected cases have shown distribution in gender; Males were 76 (58.46%) and females were 54 (41.53%). This clearly indicates

prevalence of GERD is more in males than females. Our findings correlate with the previous study conducted by Srinivas Gaddam et al., [3], Sushil Kumar et al., [4].

Age wise distribution of collected cases have shown that age below 50 years patients affected with GERD are 92 (70.77%) and

above 50 years are 38 (29.23%). This distribution clearly denotes that GERD is more prevalent in age group below 50 years due to their dietary changes (increased meat intake and decreased fruits intake) and lifestyle modifications (Tobacco and alcohol consumption). Our study correlates with the previous study conducted by Sushil Kumar et al.,^[4].

Factors such as alcohol consumption (36.93%), tobacco consumption (42.31%), tea consumption (93.07%) and meat intake (72.30%) are risk in development of GERD. Alcohol and tea are responsible for triggering acid reflux in the stomach. Our study correlates with the previous study conducted by Sanjeev Kumar et al.,^[2].

37 (28.46%) and 28 (21.53%) subjects had symptom of heartburn and regurgitation daily, 35(26.93%) and 43 (33.07%) weekly respectively. Heartburn and Regurgitation are the predominant symptoms. The study correlates with study conducted by Shaha, M., et al.,^[13]. Sushil Kumar et al.,^[4]. Shobna J. Bhatia,^[4].

GERD is caused by reflux of acid and can be treated by suppressing the acid secretion in the stomach. PPIs are considered to be the most effective drugs for GERD. Hence, symptomatic relief plays a vital role in the therapy of GERD. In this study, we compared the efficacy of Pantoprazole, Esmoprazole and Rabeprazole for symptomatic relief in GERD. PPIs were prescribed to 130 patients but only 99 cases were taken (due to loss to follow up for second endoscopy) and based on endoscopy report, Rabeprazole showed better symptomatic relief in 31 patients (37.81%) as the maximum followed by Esomeprazole in 29 patients (35.37%) and Pantoprazole in 22 patients (26.82%). Thus, from our study conducted till January 2016, Rabeprazole was found to show better symptomatic relief (endoscopy confirmation) followed by Esomeprazole and Pantoprazole. The study correlates with study conducted by Zheng Ri-Nan,^[28], P. Miner,^[15]. KM. Fock,^[17]. Pantoflickova,^[19].

All the drugs prescribed had shown impact on the grades of esophagitis ($p < 0.001$) before and after 2nd endoscopy.

Out of 99 patients, 17 patients did not show any relief. Symptomatic relief (Mucosal healing) was not observed with Pantoprazole 11 (64.72%), followed by Esomeprazole 4 (23.52%) and least by Rabeprazole 2 (11.76%). The study correlates with study conducted by D. Jaspersen,^[22].

Sample size is limited. As the study was carried out in a government hospital, only three proton pump inhibitors were available to compare. This may vary from other studies where more number of proton pump inhibitors have been prescribed. Lack of regular follow up may impact the results of the present study, which need to be considered in near future while performing these kind of studies. More over the present study is confined to single study center. In addition to that the present study center has wide variation in the socio economic aspects of patients, thus the present study may lack generalisability.

CONCLUSION

Several factors such as change in the diet, lifestyle, smoking and alcohol consumption can affect the prevalence of GERD in this rapidly progressing society. Rabeprazole was found to be more tolerated and shown a better efficacy than other proton pump inhibitors in the treatment of gastro esophageal disease.

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