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A Study on Clinical Profile of Endoscopic Proven Gastroesophageal Reflux Disease (GERD)

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Abstract
Gastroesophageal reflux disease (GERD) is a common disease of the gastrointestinal tract. GERD is defined as symptoms or mucosal damage as a result of abnormal reflux of gastric contents into the esophagus or beyond. GER (Gatroesophageal reflux) is a normal physiologic process in which there will be retrograde movement of gastric contents from the stomach to the esophagus. GER is not a disease. The present study involved 50 patients attended to the gerenral surgery department the sree mookambikai Medical College Hospital during the study period from September 2023 and augest 2024. The present study comprised of patients who Were diagnosed of Gastro-esophageal reflux disease (GERD) based on upper gastrointestinal endoscopy (UGI scopy). Total of 100 patients with upper gastrointestinal endoscopy proven Gastro-esophageal reflux disease. A total of 100 patients, diagnosed of Gastro-esophageal reflux disease (GERD) based on UGI scopy was enrolled in this study. Descriptive statistics of the collected data of total 100 patients was analyzed. Mean age of GERD patients was 56.09±15.93 years (Range: 20-82 years). Furthermore, we divided the total of 100 GERD patients into two groups: GERD with complications (24 patients) and GERD without complications (76 patients) and analyzed the documented variables between these two groups. Classical symptoms of GERD was not present in all the patients (Heartburn was present in 74% of patients, Regurgitation in 75% and Retrosternal chest pain in 66% of patients). GERD is more common in non-vegetarians than vegetarians. Order of prevalence of grades of reflux esophagitis: A>B>D> C. Prevalence of GERD complications was 24% in our syudy with order of erosive esophagitis >Barrett's esophagus and Esophageal stricture

INTRODUCTION

Gastroesophageal reflux disease (GERD) is a common disease of the gastrointestinal tract[1]. GERD is defined as symptoms or mucosal damage as a result of abnormal reflux of gastric contents into the esophagus or beyond[2]. GER (Gatroesophageal reflux) is a normal physiologic process in which there will be retrograde movement of gastric contents from the stomach to the esophagus. GER is not a disease. It occurs several times a day without mucosal damage or symptoms. GERD is caused by failure of anti reflux barrier. GERD occurs when stomach contents move to the esophagus effortlessly which cause the reflux symptoms like heartburn and regurgitation[3]. It is a multifactorial process. GERD affects the quality of life. Using endoscopy, GERD can be classified into non erosive reflux disease and erosive esophagitis. According to Los Angeles classification erosive esophagitis is graded from A-D. It have a wide variety of clinical presentations ranging from gastrointestinal (common) to extra-gastrointestinal (uncommon) symptoms. Common gastrointestinal symptoms are heartburn, regurgitation and retrosternal chest pain. Extra-gastrointestinal symptoms are bronchial asthma, laryngitis, hoarseness of voice, chronic cough, sore throat and dental erosions. Diverse studies on various population and lifestyle background had been reported in previous literature, however the data were few from our part of the country. Henceforth, warranting more studies representing the facts from our province of the country. Furthermore, longstanding and untreated GERD leads to morbid complications such as esophageal ulcer, Barrett's esophagus and esophageal stricture. However, variable inference had been postulated regarding the association of clinical, lifestyle and endoscopic characteristics associated with complications of GERD necessitating further exploration on this background.

Aims and Objectives of the Study:

Aim of the Study:

- To analyze the symptom profile of GERD.

Objectives of the Study:

- To evaluate the symptomatology of GERD.
- To analyze the dietary and lifestyle factors associated with GERD.
- To assess the prevalence of complications of GERD.
- To assess the association of clinical, lifestyle and endoscopic characteristics with complications of GERD.

MATERIALS AND METHODS

The present study involved 50 patients attended to the gerenral surgery department the sree mookambikai Medical College Hospital during the study period from September 2023 and augest 2024. The present study comprised of patients who Were diagnosed of Gastro-esophageal reflux disease (GERD) based on upper gastrointestinal endoscopy (UGI scopy). Total of 100 patients with upper gastrointestinal endoscopy proven Gastro-esophageal reflux disease. Inclusion criteria are Age >18 years, Gastro-esophageal reflux disease patients proven based on UGI scopy. Exclusion criteria included in this study are Age <18 years, Presence of mass lesion in esophagus or stomach Presence of esophageal varices, History of corrosive ingestion, Pregnant women, Terminally ill patients, Mentally challenged. The selected patients were briefed about the nature of the study and written informed consent was obtained from them in regional language. Patients who had been diagnosed as Gastro-esophageal reflux disease (GERD), based on upper gastrointestinal endoscopy were included in this study. UGI scopy had been considered the gold standard diagnostic test for the diagnosis of Gastro-esophageal reflux disease. Total of 100 UGI scopy proven GERD patients were included in this study. Patients were briefly explained about the study and informed consent was obtained from them. Subsequently, patients were interviewed for demographic details, lifestyle information and symptomatology data. The obtained patient particulars and endoscopic findings were recorded in the predesigned proforma.

RESULTS AND DISCUSSIONS

A total of 100 patients, diagnosed of Gastro-esophageal reflux disease (GERD) based on UGI scopy was enrolled in this study. Descriptive statistics of the collected data of total 100 patients was analyzed. Mean age of GERD patients was 56.09±15.93 years (Range: 20-82 years). Furthermore, we divided the total of 100 GERD patients into two groups: GERD with complications (24 patients) and GERD without complications (76 patients) and analyzed the documented variables between these two groups. Mean age of GERD with complications was 67±11.53 years (Range: 41–82 years) and mean age of GERD without complications was 52.64±15.57 years (Range: 20-82 years). Final results were interpreted in tables and /or illustrative graphs as follows. Values expressed as A (B%), represents actual numbers as A and percentage as B%. Demographic parameters analyzed were age, sex and BMI of the patients. Lifestyle parameters assessed were smoking, alcohol, spicy food, fried food, intake of meat, tea/coffee, citrus fruits, aerated drinks, heavy meals, sleep disturbances and effect on daily work. Clinical symptoms evaluated were heartburn, regurgitation, retrosternal chest pain, dysphagia, odynophagia, positional variation of these symptoms. In addition, presence of Helicobacter pylori, GERD grades and its complications were also analyzed.

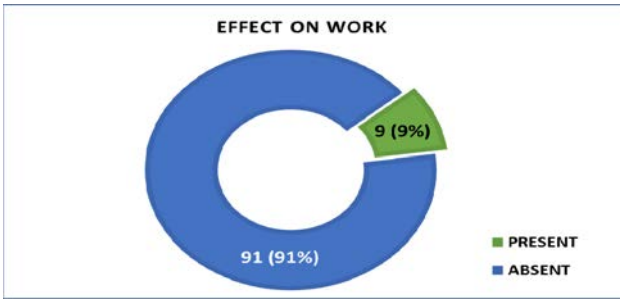

Fig. 1: Distribution of Effect on work DUE to GERD

In the current study, out of 100 GERD patients, history of effect on work due to GERD symptoms was present in 9 patients (9%) and absent in 91 patients (91%).

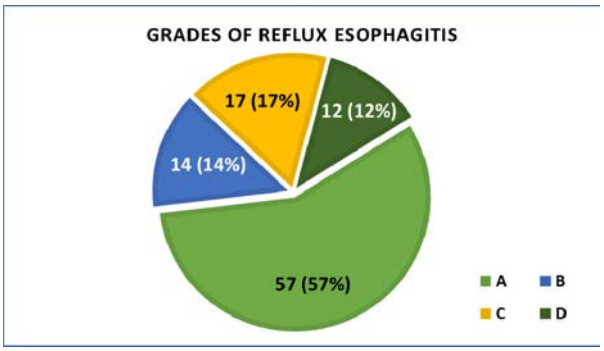

Fig. 2: Distribution of Reflux Esophagitis Grades

In our study, amongst 100 GERD patients, 57 patients (57%) belongs to Grade A, 14 patients (14%) belongs to Grade B, 17 patients (17%) belongs to Grade C and 12 patients (12%) belongs to Grade D.

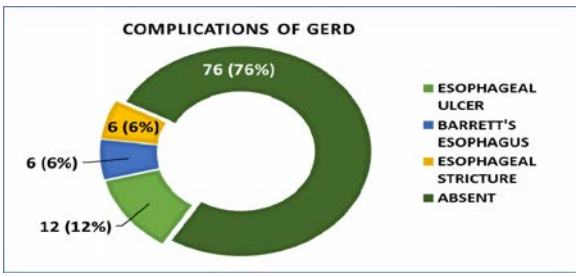

Fig. 3: Distribution of Complicatons of GERD

In the current study, out of 100 GERD patients, 12 patients (12%) had esophageal ulcers, 6 patients (6%) had Barrett's esophagus, 6 patients (6%) had esophageal stricture and 76 patients (76%) didn't have complications.

- Age of the patient showed significant statistical association between GERD with complication group vs GERD without complication group.

Table 1: Demographic Variables Between Gerd with Complications and without Complications

Independent 't' test

Demographic parameters	complication mean±sd	without complication Mean ± sd	p-value
Age	67.00 ± 11.78	52.64 ± 15.68	0.000*
Bmi	23.00 ± 3.42	23.42 ± 4.19	0.657
chisquare test			
Sex	67% males	78% males	
	33% females	22% females	0.279

* P=<0.05 IS Statistically Significant

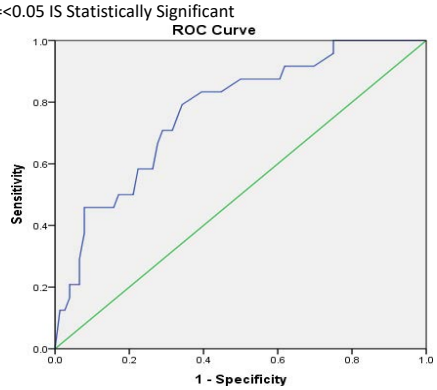

Fig. 4: ROC Curve

Table 2: ROC Analysis: Age of Patient in Relation to the Presence of Complications of Gerd

Parameter	Cut off	Auroc	Sensitivity	Specificity
AGE	≥58.5	0.769	83%	61%

- In the present study, ROC analysis of age of the patient between GERD with complication and without complication groups showed maximum area under the curve of 0.769 at cutoff of ≥58.5 years with sensitivity of 64% and specificity of 58%. This implies that we can reliably predict the presence of complications in GERD patients of age ≥58.5 years.

Table 3: Clinical Variables Between Gerd with Complications and Without Complications

Independent 't' test

Clinical Parameters	Gerd with Complication mean ± sd	without Complication mean ± sd	p value
Number of co-morbidity	1.67 ± 1.30	1.38 ± 1.38	0.375
Chisquare test			
Heart burns	0% < 2 /wk	14 % < 2 /wk	
	17 % ≥2 /wk	49 % >2 /wk	
	83% daily	3% daily	
	0% absent	34% absent	0.018*
Regurgitation	0% < 2 /wk	41% < 2 /wk	
	25 % >2 /wk	25% >2 /wk	
	75% daily	1% daily	
	0% absent	33% absent	0.023*
Retrosternal chest pain	0% < 2 /wk	42 % < 2 /wk	
	17 % >2 /wk	7 % >2 /wk	
	83% daily	6% daily	
	0% absent	45% absent	0.016*
Dysphagia	0% < 2 /wk	7 % < 2 /wk	
	13% >2 /wk	0 % >2 /wk	
	54% daily	4% daily	
	29% absent	89% absent	0.025*
Odynophagia	0% < 2 /wk	1 % < 2 /wk	
	13% >2 /wk	0 % >2 /wk	
	58% daily	0% daily	
	29% absent	99% absent	0.035*
Positional variation of symptoms	25% present	25% present	
	75% absent	75% absent	1.000

?* p=<0.05 is statistically significant

Neither of the above mentioned lifestyle parameters showed statistical significance between these two groups.

Table 4: Lifestyle Variables Between Gerd with Complications and Without Complications

Chisquare test

Lifestyle parameters	Gerd with complication	Gerd without complication	P value
Smoking	50% present	53% present	
	50% absent	47% absent	0.822
Alcohol	37% present	46% present	
	63% absent	54% absent	0.462
Veg vs nonveg	37% veg	21% veg	
	63% non veg	79% non veg	0.105
Spicy foods	50% present	62% present	
	50% absent	38% absent	0.304
Fried foods	29% present	25% present	
	71% absent	75% absent	0.685
Citrus fruits	4% present	16% present	
	96% absent	84% absent	0.140

P= <0.05 is statistically significant

Heart burns, regurgitation, retrosternal chest pain showed significant statistical association between GERD with complication group vs GERD without complication group.Although dysphagia and odynophagia showed p value of <0.05, they didn't exhibit strong association between these two groups due to lower likelihood ratio of 47.84 and 62.38 respectively.

Table 5: Lifestyle Variables Between Gerd with Complications and without Complications

Chisquare test

Lifestyle parameters	Gerd with complication	Gerd without complication	P value
Tea/coffee	38% frequent	39% frequent	
	16%infrequent	18%infrequent	
	46% absent	43% absent	0.978
Aerated drinks	0% frequent	5% frequent	
	0%infrequent	4%infrequent	
	100% absent	91% absent	0.305
Heavy meals	71% present	34% present	
	29% absent	66% absent	0.647
Sleep disturbance	71% present	33% present	
	29% absent	67% absent	0.733
Effect on work	4% present	11% present	
	96% absent	89% absent	0.343

P= < 0.05 is Statistically Significant

Neither of the above mentioned lifestyle parameters showed statistical significance between these two groups.

Table 6: Analysis of Reflux Esophagitis Grades and H. Pylori Between with Complications and without Complications

Chisquare test

Parameters	Gerd with Complication	Gerd Without Complication	P value
H.pylori	83% present	22% present	
	17% absent	78% absent	0.000*
Reflux esophagitis grades	0% a	16% b	
	8% b	8%c	
	46%c	1% d	
	46% d	75% a	0.000*

*P= <0.05 IS Statistically Significant

Presence of H.pylori showed significant statistical association between GERD with complication group vs GERD without complication group.Although grades of reflux esophagitis showed p value of <0.05, it didn't exhibit strong association between these two groups due to lower likelihood ratio of 69.77. In our study, we found that out of 100 GERD patients, 75% were males and 25% were females with male to female ratio of 4:1. Our findings were in contrary to previous meta-analysis study by Kim[4], who inferred that GERD affects more frequent in women than men. In this present study, we found that 70% of the patients had BMI <25 and 30% of the patients had BMI <25, contradicting the inference of previous study by Jacobson[5], who found that GERD symptoms exacerbation is more frequent in patients with BMI of <25. In addition, this study showed that out of 100 GERD patients, 69% had associated co-morbidities of which 48% had <3 co-morbidities and 21% had ≥3 co-morbidities. This finding supports the previous study by Moraes-Filho[6], who postulated the strong association of co-morbidities with GERD and its worsening effect on GERD. Though heartburn, regurgitation and retrosternal chest pain are the classic presenting symptoms of GERD, in our study these symptoms were not seen in all the patients included in this study. Heartburn was absent in 26% of the patients and was present in 74% of the patients of which 11 patients had frequency of >2 episodes/week, 41 patients had frequency of >2 episodes/week and 22 patients had daily episodes of heartburn. Regurgitation was absent in 25% of the patients and was present in 75% of the patients of which 31 patients had frequency of ≤2 episodes/week, 25 patients had frequency of >2 episodes/week and 19 patients had daily episodes of regurgitation. Retrosternal chest pain was absent in 34% of the patients and was present in 66% of the patients of which 32 patients had frequency of ≤2 episodes/week, 9 patients had frequency of >2 episodes/week and 25 patients had daily episodes of retrosternal chest pain. Furthermore, dysphagia and odynophagia have been described as third most common clinical symptom of GERD[7]. In contrary, in our study 75% of patients didn't have dysphagia and 82% of patients didn't have odynophagia. Previous study by Kahrilas[8] inferred that heart burn was present in nearly all GERD patients in their study and regurgitation was found in 80% of GERD patients, in contradiction to the results of our present study. Amongst 100 GERD patients in our study, 75 patients didn't have positional variation of symptoms and rest 25 patients had positional variation of any of the GERD symptoms described above. In a previous study by Çela[8], they inferred that the prevalence of GERD is significantly higher in smokers, alcoholics and individuals with increased frequency of consumption of meat, fried foods and spicy foods. In accordance with these findings, our study showed more number of patients (75%) are non-vegetarians and rest (25%) were vegetarians. Besides, we found the reverse trend in history of smoking, alcohol, intake of fried foods and spicy foods. In this study, amongst 100 GERD patients,

52 patients had history of smoking and 48 patients didn't have history of smoking, 44 patients had history of alcohol consumption and 56 patients didn't have history of alcohol consumption, 51 patients had history of spicy foods consumption and 49 patients didn't have history of spicy foods consumption, 26 patients had history of history of intake of fried foods and 74 patients didn't have history of intake of fried foods.

Literature Search Revealed the Refluxogenic Properties of the Following Products: Citrus fruits and juices, tomatoes, coffee/tea, aerated drinks and chocolate[9,10]. Postulated mechanism by which these dietary products cause or aggravate GERD symptoms was by increased gastric juice secretion, delaying stomach evacuation and decreased LES pressure. In this present study we found that history of citrus fruits intake was absent in 87% of the patients and present in 13% of the patients, history of coffee / tea intake was absent in nearly half of the patients (44%) and present in 56% of the patients, history of intake of aerated drinks was absent in 93% of the patients and present in 7% of the patients. Our findings were in concordance with the previous study by Song[11], who confirmed the negative influence of these refluxogenic products on GERD. It was a common belief that eating habits such as heavy meals and eating directly before sleep might contribute to the occurrence of symptoms of GERD. Although previous studies by Iwakiri[11] and Fujiwara[12] postulated the negative influence of these eating habits on the aggravation or occurrence of GERD symptoms. In our study we inferred that history of heavy meal intake was absent in 67% of the patients and present in 33% of the patients, which postulates that no significant contribution of heavy meal intake towards occurrence of GERD symptoms which is in concordance with previous studies[10,12]. In the previous study by Gross[13] postulated that GERD had substantial effect on work productivity in study of 249 German patients with GERD, although patients were on routine clinical care and proton pump inhibitors therapy. In contrary to this finding we found that effect of work on GERD was absent in 91% of the patients and was present in 9% of the patients amongst 100 GERD patients included in this study. In another study by Jung[13], inferred that complex relationship between GERD and sleep exists and further they suggested modest bidirectional association of GERD and sleep disturbance. In contrast to these findings, our study showed sleep disturbances were present in 32% of the patients and absent in 68% of the patients. In this present study, we found that Helicobacter pylori was present in 37% of the patients and was absent in 63% of the patients. Previous studies[15,16] by many authors proposed a strong argument regarding the protective role of Helicobacter pylori against GERD. Prevalence of Helicobacter pylori was reported to be low about 5-10% in patients affected with GERD in comparison to the control groups by previous studies[15,16]. Our findings were in contrast to these studies. Los Angeles classification system published in 1999 (136) was the widely accepted for categorizing reflux esophagitis on UGI scopy. In this present study, 57% patients had Grade A reflux esophagitis, 14% patients had Grade B reflux esophagitis, 11% of the patients had Grade C reflux esophagitis and 12% patients had Grade D reflux esophagitis. Complications of GERD includes erosive esophagitis with ulcers, Barrett's esophagus and esophageal stricture. In previous study by Spechler[18] showed that esophageal adenocarcinoma is the most common complication of GERD and warranted serial endoscopic screening for development of Barrett's esophagus. In another study by Chait[19] postulated that 20% of the adults with GERD have serious complications. Supporting this finding, our study showed that 24% of the patients had complications (12% esophageal ulcer, 6% Barrett's esophagus and 6% esophageal stricture) and rest 76% of the patients didn't have complications. Furthermore in our study, we divided 100 GERD patients into two groups based on the presence of complications-GERD with complications and without complications. We analyzed the various demographic, symptomatology, lifestyle and endoscopic parameters between these two groups. Of the demographic parameters, age of the patient showed significant association with the presence of complications (p= 0.000). Higher the age of the patient, higher the risk of complication. In addition, we derived cutoff of $\geq$58.5 years (AUROC: 0.769) to depict the higher risk of complications in GERD patients with 83% sensitivity and 61% specificity. This finding was in contradiction to previous study by Thrift AP et al(20) , in which they has inferred that risk of GERD complications is higher in patients presenting at earlier in their life (<30 years). Apart from age of the patient, other demographic variables such as sex and BMI didn't show statistical significance between these two groups. In the present study we found that heart burn, regurgitation, retrosternal chest pain showed significant association between GERD with complications and without complications groups. It can be postulated that daily episodes of heart burn (p=0.018) infers high risk of GERD complications. Similar trend can be inferred for regurgitation (p=0.023) and retrosternal chest pain (p=0.016). Although dysphagia and odynophagia showed p value of<0.05, they didn't exhibit strong association between these two groups due to lower likelihood ratio of 47.84 and 62.38 respectively. Rest of the clinical parameters such as number of co-morbidities and positional variation of symptoms didn't show significant difference between these two groups. Current study showed that neither of the lifestyle parameters such as

smoking, alcohol, intake of meat, spicy foods, fried foods, citrus fruits, heavy meals, tea/coffee and aerated drinks had significant difference between GERD with complication and without complication. In addition, sleep disturbance and effect on work also didn't show significant difference between these two groups. In our study, we inferred that presence of Helicobacter pylori in GERD patients signifies higher risk of complications (p=0.000). H.pylori was present in 83% of patients in in GERD with complications group and was absent in 78% of the patients in GERD without complications group. Although grades of reflux esophagitis showed p value of <0.05, it didn't exhibit strong association between these two groups due to lower likelihood ratio of 69.77. However, grades C and D were moderately higher in GERD with complications group.

CONCLUSION

Classical symptoms of GERD was not present in all the patients (Heartburn was present in 74% of patients, Regurgitation in 75% and Retrosternal chest pain in 66% of patients). GERD is more common in non-vegetarians than vegetarians. Order of prevalence of grades of reflux esophagitis: A>B>D>C. Prevalence of GERD complications was 24% in our syudy with order of erosive esophagitis >Barrett's esophagus and Esophageal stricture. Higher age of the patient infers higher risk of complications (Cut off : ≥58.5).Daily episodes of heartburn, regurgitation and retrosternal chest pain implies higher risk of complications.

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