

## Original Research Article

DOI: <http://dx.doi.org/10.18203/2349-2902.ijssurgery20191027>

# A cross sectional study on clinical profile of endoscopic proven gastroesophageal reflux disease

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**Received:** 19 February 2019

**Revised:** 26 February 2019

**Accepted:** 28 February 2019

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## ABSTRACT

**Background:** Gastroesophageal reflux disease (GERD) is one of the main gastrointestinal diseases. It is due to the abnormal reflux of gastric contents into the esophagus or beyond. It has many symptoms and also many complications.

**Methods:** Authors carried out this study to know the common symptoms, complications of GERD and the endoscopic study results regarding the same. 100 patients attending the surgery department at a tertiary care hospital were included in the study.

**Results:** Mean age of participants was  $54.09 \pm 14.75$  years. Authors divided the 100 patients into two groups, GERD with complications (28 patients) and GERD without complications (72 patients). In the present study, out of 100 GERD patients, 73 patients were males (73%) and 27 patients were females (27%) with male to female ratio of 2.7:1. In this study, among 100 GERD patients, body mass index was  $<25$  in 70 patients (70%) and  $\geq 25$  in 30 patients (30%). Heartburn was present in 72% patients, regurgitation in 71%, retrosternal chest pain was seen in 68% patients and dysphagia was seen in 29%. Out of 100 GERD patients, 16 patients (16%) had esophageal ulcers, 8 patients (8%) had Barrett's esophagus, 4 patients (4%) had esophageal stricture and 72 patients (72%) didn't have any complications.

**Conclusions:** Age and BMI (both  $p < 0.001$ ) of the patients showed significant statistical difference between two groups. Some other studies also showed similar results with higher complications seen in increasing age and increased frequency of symptoms.

**Keywords:** Endoscopy, Esophagitis, Gastroesophageal reflux disease (GERD)

## INTRODUCTION

Gastroesophageal reflux disease (GERD) is one of the most common diseases of the gastrointestinal tract.<sup>1</sup> GERD is defined as symptoms of or mucosal damage as a result of the abnormal reflux of gastric contents into the esophagus or beyond.<sup>2</sup> GER (Gastroesophageal reflux) is the normal physiologic process in which there is retrograde movement of the gastric contents from

stomach to the esophagus. GER is not a disease. It occurs several times a day without any 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 the regurgitation.<sup>3</sup> 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 has 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.

In the last 2 decades, the prevalence of GERD has increased.<sup>4</sup> The exact prevalence rate of GERD is difficult to find out, because many affected individuals are asymptomatic. The prevalence may be underestimated with data based on esophagitis (mucosal damage). Esophageal pH monitoring on large scale is not possible. In United States, gallup organization conducted a population survey and found out that 44% of the participants had heartburn once a month.<sup>5</sup>

From another study in Olmsted Country, Minnesota, the prevalence was 42% for heartburn and 45% for acid regurgitation. 20% of participants had weekly symptoms.<sup>6</sup> GERD prevalence is higher in the western countries and it is increasing in India nonetheless there have been only few studies on GERD in India.<sup>6,7</sup> GERD had the highest annual direct costs in the United States (\$9.3 billion).<sup>8</sup> GERD prevalence estimates was 18.1%-27.8% in North America, 8.8%-25.9% in Europe, 2.5%-7.8% in East Asia, 8.7%-33.1% in the Middle East, 11.6% in Australia and 23.0% in South America.<sup>9</sup>

In one study 7.6% of Indian subjects had significant GERD symptoms.<sup>10</sup> In another study the prevalence of GERD was 22.2 % in southern India.<sup>11</sup> Male and female are equally affected by GERD, whereas esophagitis and barrett's esophagus are predominant in male gender. The prevalence of complications of GERD are associated with increasing age, probable reason being as a result of accumulative injury by the acid to the esophagus over the years.<sup>12</sup> From one study the prevalence of GERD has increased along with the increase in obesity.<sup>13</sup> In contrary, a study among older adult men from Sweden did not find an association between GERD and obesity.<sup>14</sup> Another large study showed that there is significant between the GERD symptoms and abdominal diameter, irrespective of the BMI.<sup>15</sup>

The symptoms like heartburn and acid regurgitation are considered to be reasonably specific for diagnosis of GERD.<sup>16</sup> Heartburn also occurs after large meals, spicy foods, alcohol, citrus fruits, chocolates and fats. Heartburn can be aggravated by bending over or in supine position.<sup>17</sup> One study demonstrated that acute auditory stress in GERD patients can increase the heartburn symptoms.<sup>18</sup>

Another study showed that GERD patients with sleep deprivation is hyperalgesic and provides a potential mechanism for increased severity in GERD symptoms.<sup>19</sup> In another study, about one third of GERD patients are psychologically distressed.<sup>20</sup> Heartburn occurring in the night can cause sleep deprivation and can impair the next day work.<sup>20</sup>

Acid regurgitation and dysphagia are the other common symptoms of gastroesophageal reflux disease. The regurgitation of acidic fluid effortlessly, particularly after heavy meals and it is aggravated by supine or stooping position, is highly suggestive of gastroesophageal reflux disease.<sup>16</sup> Dysphagia is experienced by more than 30% of patients with gastroesophageal reflux disease.<sup>21</sup>

Less common symptoms of gastroesophageal reflux disease are burping, water brash, nausea, odynophagia, hiccups and vomiting.<sup>22</sup> Water brash is experienced as a sudden appearance of salty or sour fluid in the mouth. It is secreted in response to the acid from the salivary glands and not regurgitated fluid.

Most of the elderly patient with gastroesophageal reflux disease are asymptomatic. The reason being less acidity in the reflux material and decreased perception of pain in some patients.<sup>23</sup> Many elderly patients present with the GERD complications first, with long-standing disease. In patients with Barrett's esophagus, at the time of presentation one third of them were insensitive to acid.<sup>24</sup>

Upper GI endoscopy is the standard test used for diagnosis of esophagitis, it also tells us the extent of involvement. It also excludes the other causes for symptoms. Only 20-60% of GERD patients by pH testing have esophagitis at upper GI endoscopy.<sup>25</sup>

The earliest finding of acid reflux in endoscopy is erythema and edema, they are nonspecific and these finding are dependent on the endoscopic quality of image.<sup>26</sup> Complications of GERD are hemorrhage, esophageal ulcers and esophageal perforation. The objectives of the study were to describe symptom profile of GERD, to assess the complications of GERD by endoscopy.

## METHODS

A cross sectional observational study was performed for one year, from April 2017 to March 2018. In the

Department of Surgery, in a Medical college and tertiary care centre, Karad City, Maharashtra, India.

The present study comprised of patients who were diagnosed of Gastro-esophageal reflux disease (GERD) based on upper gastrointestinal endoscopy (UGI scopey). Total of 100 patients with upper gastrointestinal endoscopy proven gastro-esophageal reflux disease.

#### **Inclusion criteria**

- Age >18 years,
- Gastro-esophageal reflux disease patients proven based on UGI scopey.

#### **Exclusion criteria**

- 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.

#### **Data collection**

Patients who had been diagnosed as gastro-esophageal reflux disease (GERD) based on upper gastrointestinal endoscopy were included in this study. UGI scopey had been considered the gold standard diagnostic test for the diagnosis of gastro-esophageal reflux disease. Total of 100 UGI scopey 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.

#### **Statistical analysis**

The data obtained was coded and entered in Microsoft Excel Spreadsheet. Data was analyzed using SPSS version 20.0 statistical software. Descriptive statistics of the collected data was analyzed. Categorical variables were expressed as percentages and the comparative analysis was done using chi-square test or Fischer exact test. Continuous variables were expressed as mean $\pm$  standard deviation (SD) and the comparative analysis was done by independent sample 't' test. A probability value (p value) of less than or equal to 0.05 at 95% confidence interval was considered as statistically significant.

#### **RESULTS**

A total of 100 patients, diagnosed of gastro-esophageal reflux disease (GERD) based on UGI scopey were enrolled in this study. Descriptive statistics of the

collected data of total 100 patients were analyzed. Mean age of GERD patients was  $54.09\pm14.75$  years (range: 23-85 years). Furthermore, authors divided the total of 100 GERD patients into two groups: GERD with complications (28 patients) and GERD without complications (72 patients) and analyzed the study variables between these two groups.

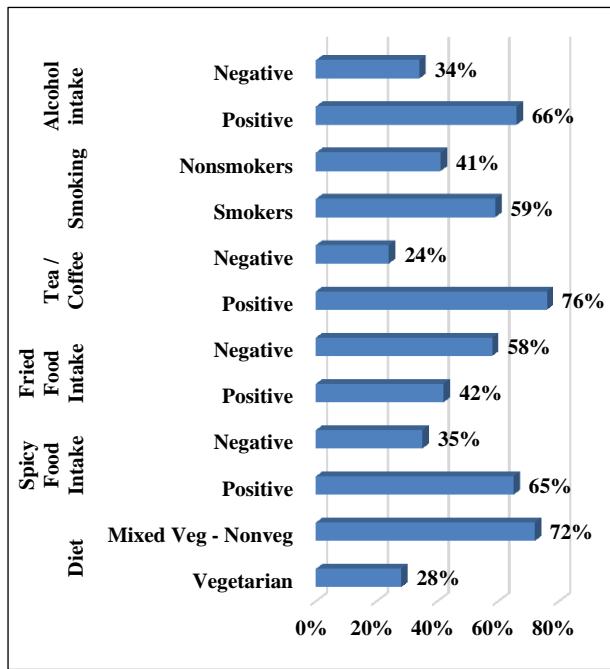
Mean age of GERD with complications was  $65.36\pm12.24$  years (range: 44-80 years) and mean age of GERD without complications was  $54.67\pm14.32$  years. In the present study, out of 100 GERD patients, 73 patients were males (73%) and 27 patients were females (27%) with male to female ratio of 2.7:1.

In this study, among 100 GERD patients, body mass index was <25 in 70 patients (70%) and  $\geq 25$  in 30 patients (30%). In the current study, amongst all GERD patients, 33 patients didn't have co-morbidities (33%), 44 patients (44%) had <3 co-morbidities and 23 patients (23%) had  $\geq 3$  co-morbidities. In present study, amongst all 100 GERD patients, heartburn symptom was absent in 28 patients (28%), daily episodes in 20 patients (20%), >2 episodes/week in 42 patients (42%) and  $\leq 2$  episodes/week in 10 patients (10%). In this study, among the 100 patients, regurgitation was absent in 29 patients (29%), daily episodes in 17 patients (17%), >2 episodes/week in 26 patients (26%) and  $\leq 2$  episodes/week in 28 patients (28%). In the study, out of the 100 GERD patients, retrosternal chest pain was not seen in 32 patients (32%), daily episodes were seen in 20 patients (20%), >2 episodes/week in 14 patients (14%) and  $\leq 2$  episodes/week in 34 patients (34%). In this study, among all 100 GERD patients, dysphagia was absent in 71 patients (71%), daily episodes in 19 patients (19%), >2 episodes/week in 6 patients (6%) and  $\leq 2$  episodes/week in 4 patients (4%). In the present study, out of 100 GERD patients, history of smoking was present in 59 patients (59%) and absent in 41 patients (41%). Authors regarded positive history of smoking as smoking of  $\geq 2$  cigarettes/week.

In this study, among 100 GERD patients, alcohol intake history was present in 66 patients (66%) and absent in 34 patients (34%). Authors regarded positive history of alcohol as intake  $\geq 90$  ml/week. In the present study, out of 100 GERD patients, 28 patients (28%) were vegetarians and 72 patients (72%) were of mixed veg and non-veg diet. Authors regarded patients as mixed diet, upon intake of any kind of meat at frequency of  $\geq 2$  dishes/week. In this study, among 100 GERD patients, history of spicy food intake was present in 65 patients (65%) and absent in 35 patients (35%). In the present study, out of 100 GERD patients, history of fried foods intake was present in 42 patients (42%) and absent in 58 patients (58%).

Authors regarded positive history as  $\geq 2$  dishes/week. In the present study, out of 100 GERD patients, history of tea/coffee intake was absent in 24 patients (24%),

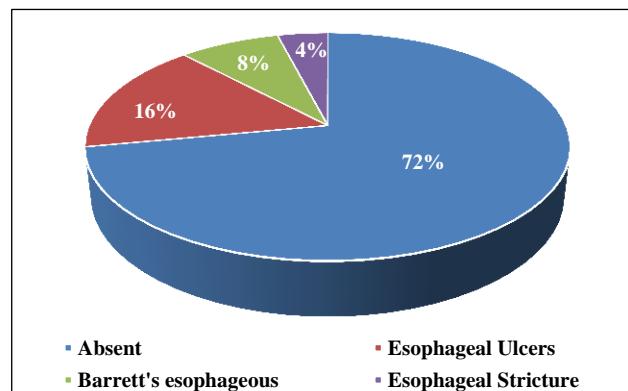
frequent intake (>3 cups/day) in 49 patients (49%) and infrequent intake in 27 patients (27%) (Figure 1).



**Figure 1: Dietary and addiction habits of participants.**

In the current study, out of 100 GERD patients, 16 patients (16%) had esophageal ulcers, 8 patients (8%) had Barrett's esophagus, 4 patients (4%) had esophageal

stricture and 72 patients (72%) didn't have any complications (Figure 2). Age and BMI (both  $p < 0.001$ ) of the patients showed significant statistical difference between GERD with complication group vs GERD without complication group (Table 1).



**Figure 2: Complications.**

**Table 1: Age, BMI and complications.**

Demographic variables	Independent 't' test		
	Complications (28)	No complications (72)	P-value
Age (years)	65.36±12.24	54.67±14.32	<0.001
BMI (kg/m <sup>2</sup> )	35.2±5.4	28.4±3.6	<0.001

**Table 2: 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-morbidities	1.62±1.2	1.40±1.37	0.372
Chi-square test			
Heart burns	1% <2/weeks 15 % ≥2/weeks 83% daily 1% absent	13 % <2/weeks 50 % ≥2/weeks 13% daily 24% absent	<0.001
Regurgitation	2% <2/weeks 25 % ≥2/weeks 72% daily 1% absent	41% <2/weeks 25% ≥2/weeks 1% daily 33% absent	<0.001
Retrosternal chest pain	2% <2/weeks 15 % ≥2/weeks 82% daily 1% absent	42 % <2/weeks 8 % ≥2/weeks 7% daily 43% absent	0.002
Dysphagia	0% <2/weeks 12% ≥2 /weeks 55% daily 29% absent	7 % <2/weeks 1 % ≥2/weeks 4% daily 88% absent	0.025*

\*  $P = <0.05$  is statistically significant.

Heartburn, regurgitation, retrosternal chest pain and dysphagia showed significant difference between the two groups ( $p < 0.05$ ), while the number of comorbidities were not showing any significant difference (Table 2).

## DISCUSSION

Authors divided 100 GERD patients into two groups based on the presence of complications-GERD with complications and without complications. Authors analyzed the various demographic, symptomatology, lifestyle and endoscopic parameters between these two groups.

In the present study, authors 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 ( $p < 0.05$ ) infers high risk of GERD complications. Similar trend can be inferred for regurgitation ( $p < 0.05$ ) and retrosternal chest pain ( $p < 0.05$ ).

In this present study, authors found that 70% of the patients had  $BMI < 25$  and 30% of the patients had  $BMI \geq 25$ , while in the inference of similar study by Jacobson BC et al, who found that the GERD symptoms exacerbation is more frequent in patients with  $BMI \geq 25$ .<sup>27</sup> This study showed that out of 100 GERD patients, 69% had associated co-morbidities of which 48% had  $< 3$  co-morbidities and 21% had  $\geq 3$  co-morbidities. This finding supports the previous study by Moraes-Filho JPP et al, who had postulated the strong association of co-morbidities with GERD and its worsening effect on GERD.<sup>28</sup> Complications of GERD includes erosive esophagitis with ulcers, Barrett's esophagus and esophageal stricture. In previous study by Spechler SJ et al, showed that esophageal adenocarcinoma is the most common complication of GERD and warranted serial endoscopic screening for development of Barrett's esophagus.<sup>29</sup>

In another study by Chait MM et al, postulated that 20% of the adults with GERD have serious complications. Supporting this finding, present study showed that 28% of the patients had complications (16% esophageal ulcer, 8% Barrett's esophagus and 4% esophageal stricture) and rest 72% of the patients didn't have complications.<sup>30</sup>

## CONCLUSION

Classical symptoms of the GERD were not present in all the study patients. Prevalence of GERD complications were 28% in present study with order of erosive esophagitis  $>$ Barrett's esophagus and Esophageal stricture. Higher age of the patient infers higher risk of complications. Daily episodes of heartburn, regurgitation

and retrosternal chest pain implies higher risk of complications.

*Funding: No funding sources*

*Conflict of interest: None declared*

*Ethical approval: The study was approved by the Institutional Ethics Committee*

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**Cite this article as:** Anshuman, Kulkarni SR. A cross sectional study on clinical profile of endoscopic proven gastroesophageal reflux disease. *Int Surg J* 2019;6:1153-8.