INTRODUCTION

Gastroesophageal Reflux Disease (GERD) is the term used to encompass all of the manifestations of exposure of the esophagus to the gastric contents. The pathophysiology of GERD differs between obese and lean subjects but it is claimed that GERD is common in obese patients. First, hiatal hernia, capable of promoting GERD by several mechanisms, is more prevalent among the obese. Second, obese subjects have increased intraabdominal pressure that displaces the lower esophageal sphincter and increases the gastroesophageal gradient. Third, vagal abnormalities associated with obesity may cause a higher output of bile and pancreatic enzymes, which makes the refluxate more toxic to the esophageal mucosa.

Symptoms commonly identified with GERD, occur spontaneously or are precipitated by positioning such as leaning forward, lying down or physical activity, food, drink or medicines which decrease the pressure of the lower esophageal sphincter and in the intraabdominal pressures. Symptoms are present in 82-97% of subjects with endoscopically proven esophagitis, but their positive predictive value for esophagitis is only 20-60% and their negative predictive value for GERD is too low to be used for screening purposes. So, using symptoms analysis alone doesn’t reflect the severity of GERD. In recent years, Body Mass Index (BMI), has become the choice to measure overweight and obesity in adults. BMI is direct calculation that describes relative weight for height, is not gender specific and is significantly correlated with total body fat content.

The objective of this study was to assess the correlation of endoscopic severity of Gastroesophageal Reflux Disease (GERD) with Body Mass Index (BMI).

PATIENTS AND METHODS

A Gastroenterological team at Ghurki Trust Teaching Hospital and Surgimed Hospital, Lahore, conducted a study on 203 patients, who presented with upper GI symptoms in the Gastroenterology Clinic, from September 2004 to March 2006. A validated American College of Gastroenterology (ACG) GERD questionnaire was filled and patients who fulfilled the symptom criteria were referred for endoscopy. Classification of GERD was done according to LA Grading classification system. Body mass index (BMI) was calculated as Body Weight (BW) in kilograms (kg) divided by the square of the body height (BH) in meter (m²). Patient data was analyzed using SPSS 12 software. Statistical evaluation was done using non-parametric Wilcoxon’s-sign Rank test. P-value <0.05 was considered to be statistically significant.

RESULTS: Distribution of GERD was as follows: GERD-A subjects 65 (32%), GERD B subjects 72 (35.4%), GERD-C subjects 23 (11.3%), GERD-D subjects 10 (4.92%), while Non-Erosive Reflux Disease (NERD) was present in 33 subjects (16.2%). Mean BMI was 27±5.02SD (range of 18.2-38.3). BMI of patients having NERD was in normal range but patients who were having advanced disease i.e. Grade C-D were in obese range of BMI, while those who were having LA grade A-B were in overweight BMI range. When regrouped as mild GERD (grade A-B) and NERD versus severe GERD (grade C-D), there was a strong significant correlation between severity of GERD and BMI, as detected by Wilcoxon’s signed Rank test (p=0.001).

CONCLUSION: Higher BMI seems to be associated with higher degree of endoscopic GERD severity.


ABSTRACT

Objective: To assess the correlation of endoscopic severity of Gastroesophageal Reflux Disease (GERD) with Body Mass Index (BMI).

Design: Cross-sectional/analytical.

Place and Duration of Study: Ghurki Trust Teaching Hospital and Surgimed Hospital, Lahore, from September 2004 to March 2006.

Patients and Methods: This study was conducted on 203 patients, who presented with upper GI symptoms. Patients who fulfilled the symptom criteria were referred for endoscopy. Classification of GERD was done according to LA Grading classification system. Body mass index (BMI) was calculated as Body Weight (BW) in kilograms (kg) divided by the square of the body height (BH) in meter (m²). Patient data was analyzed using SPSS 12 software. Statistical evaluation was done using non-parametric Wilcoxon’s-sign Rank test. P-value <0.05 was considered to be statistically significant.

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Conclusion: Higher BMI seems to be associated with higher degree of endoscopic GERD severity.

Correlation of endoscopic severity of GERD with BMI

GERD symptoms were defined as heartburn (a burning feeling arising from the stomach or lower part of the chest up- towards the neck) and acid regurgitation (flow of sour or bitter fluid into the mouth) present from last one month or longer. Adult patients of either gender, who did not get any treatment in the past, were included in the study group.

Patients with ongoing treatment for peptic ulcer with anti-secretory or anti Helicobacter pylori therapy (proton pump inhibitors, H2 blockers, prokinetics, antibiotics) were excluded. Concurrent diagnosis of IBS, other erosive or ulcerative gastric or duodenal lesions, at the time of endoscopy, daily use of ASA or NSAIDS, major psychiatric illness or dementia were also excluded. Pregnant, those having any metabolic disorder or advanced liver or renal disease patients were also not included.

Anthropometrical measurements were taken using standard apparatuses. A digital scale (seca) was used to measure Body Weight (BW) with an accuracy of +100g. Subjects were weighed without shoes, in light clothing. Standing Body Height (BH) was measured without shoes to the nearest 0.5 cm with the use of a commercial stadiometer with the shoulders in relaxed position and arms hanging freely. Body Mass Index (BMI) was then calculated as BW in kilograms (kg) divided by the square of the BH in meter (m²).

Patient data, frequency of symptoms, anthropometric values and severity of grades of GERD (A-D) were analyzed using SPSS 10 software. Differences between groups were estimated using non-parametric Wilcoxon’s sign rank test. P-value <0.05 was considered to be statistically significant.

RESULTS

The total number of study patients was 203. The age range was 16-75 years with mean age of 37 years. Male to female ratio was 1.1.4. Smoking habit was present in 40%, while alcohol intake was present in 10%. Amongst the study population, 12% were diabetic, 20% were hypertensive, while 3% got concomitant HCV infection as well, but were not in decompensated state.

Using the LA Classification System®, the distribution of GERD was as follows: GERD A subjects 65 (32%), GERD B subjects 72 (35.4%), GERD C subjects 23 (11.3%), GERD D subjects 10 (4.92%), while non-erosive reflux disease NERD was 72 (35.4%), GERD C subjects 23 (11.3%), GERD D subjects 10 (4.92%), while non-erosive reflux disease NERD was 72 (35.4%), GERD C subjects 23 (11.3%), GERD D subjects 10 (4.92%), while non-erosive reflux disease NERD was 72 (35.4%), GERD C subjects 23 (11.3%), GERD D subjects 10 (4.92%). Smoking habit was present in 40%, while alcohol intake was present in 10%.

Mean BMI was 27±5.02SD with a range of 18.2-38.3. BMI of patients was in normal range of almost all patients who were having NERD. But patients who were having advanced disease i.e. Grade C-D were in obese range of BMI (mean BMI of 30 and 31 respectively), while those who were even having LA grade A-B were in overweight BMI range (mean BMI of 25 and 28 respectively). For statistical analysis, using Wilcoxon’s signed Rank test regrouping as mild GERD (grade A-B) and NERD versus severe GERD (grade C-D) and found that there was a strong significant correlation between severity of GERD and BMI (p<0.001).

DISCUSSION

Gastroesophageal reflux disease is a spectrum of disease with classic symptoms of heartburn and acid regurgitation at one end without any evidence of esophageal mucosal injury and erosive esophagitis and complications of Barrett’s esophagus and esophageal adenocarcinoma at the other end.8 The relationship between overweight (BMI 25 kg/m²) and obesity (BMI 30 kg/m²) with GERD is still controversial. There are large-scale trials both in favor and against the relationship of GERD with BMI. But these studies have examined the correlation between the degree of obesity and the existence / frequency of GERD symptoms using surveys, esophageal sphincter manometry or 24 h pH monitoring. In this study, the association between BMI and endoscopically proven mucosal damage was analyzed in patients having symptoms of GERD using LA (Los-Angeles) grading classification.8 It was utilized to categorize patients with GERD into grade A to D severity groups and those having non-erosive reflux disease (NERD).

On the assumption that obesity predisposes to GERD, weight loss is often recommended as part of “lifestyle modification” for the treatment of GERD. There are no good published data to support such a recommendation up till now. The present study suggests that obesity, as defined by BMI, is significantly associated with severity of esophagitis which could be mediated by various mechanisms like increased intraabdominal pressure, increased intragastric pressure, greater lower esophageal sphincter (LES) relaxation, an abnormal diaphragmatic pinchcock, and a delayed acid clearance and even more than one mechanism may apply. These potential mechanisms could explain a predisposition for obese persons to reflux of gastric contents, which might, among other things, decrease the effectiveness of the lower esophageal sphincter function and impair effective esophageal acid clearance.10

A cross-sectional study in US¹¹ demonstrated an odds ratio of 2.8 for at least weekly reflux symptoms in obese subjects. In this study, a questionnaire was posted to the residents of Olmsted County, Minnesota, and subjects were asked whether they had symptoms compatible with heartburn or acid regurgitation and, if so, the frequency with which they occurred. Sixty nine percent of the subjects with a BMI of 30.0 were found to be symptomatic. They proved that obesity was the strongest of all risk factors for the development of...
GERD, surpassing family history, a previous history of smoking and alcohol consumption as risk factors for GERD. A similar work by Tamis et al. showed significant relationship with endoscopic severity of GERD by Savary Miller Classification and increasing BMI. He also proved that obesity might not be the primary cause of GERD but a risk factor for increasing severity in those already having the disease. An association between GERD symptoms and obesity has been recently shown by Hashem et al. where he proved that overweight and obesity were strong independent risk factors for GERD and esophageal erosions, and amount and composition of dietary intake doesn’t seem to be responsible for this.

In a Swedish based study, no relation was found between BMI and severity of symptoms of GERD, and it was found that GERD occurs independently of BMI and weight reduction may not be a good idea as a part of treatment of GERD. Mercer et al. in a study of esophageal manometry in 8 asymptomatic lean and 8 asymptomatic obese subjects, reported that obese individuals had significantly elevated Gastroesophageal Pressure Gradient (GEPG) at both inspiration and expiration, and a significantly elevated ratio of GEPG to lower esophageal pressure (GEPG/LES). Studies of pressure dynamics in the stomach and the LES have showed that acute increases of intraabdominal pressure, such as during the Valsalva maneuver, are accompanied by an adaptive increase in LES pressure but these were performed in normal subjects rather than in patients with GERD, and do not necessarily apply to the changes in gastroesophageal pressure that may occur in obese population.

Reviewing the available work on this topic, this is apparent that there is still no generally agreed standard definition of measurement of the occurrence of GERD. Even if we were to accept the evaluation, based on the reflux symptoms due to lack of other gold standard, endoscopy is still needed to measure severity. That is why we have used the endoscopic classification for determining the severity of GERD.

In the present population with typical and frequent GERD symptoms, patients were selected for upper GI endoscopy. Dividing them into two subgroups, on the grounds of endoscopic findings, as a mild lesion group (NERD+LA grade A-B) and moderate/severe erosive lesion group (LA C-D grade), a strong correlation was detected between BMI and GERD severity. This finding suggests that obesity and increased BMI is not necessarily the primary cause of GERD but it could be a risk factor for more serious mucosal lesions in the esophagus increasing the possibility of complications of the higher grades of GERD.

Early detection and evaluation of GERD prevents a person from further complications especially Barrett esophagus and esophageal adenocarcinoma. In a population of 85 GERD and 100 Barrett patients, Korn et al. found no significant correlation between overweight and GERD but patients with Barrett esophagus had significantly higher body mass index than the normal controls. A large population-based case control study showed that BMI >30 increased the risk of EAC by 16-fold compared to persons with BMI < 22. In the Swedish nationwide case control study, higher severity of reflux symptoms together with elevated BMI, increased the risk of esophageal adenocarcinoma in a dose dependent manner. They found GERD and obesity as strong and independent risk factors of esophageal adenocarcinoma.

CONCLUSION

In conclusion, it is proved in our study that higher BMI seems to be associated with higher degree of endoscopic GERD severity, which may worsen health related quality of life and elevating the risk of Barrett’s esophagus and adenocarcinoma.

REFERENCES

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