

Frequency of Obesity among Gastroesophageal Reflux Disease Patients

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ABSTRACT

Objective: Gastroesophageal reflux disease (GERD) prevalence ranges from 24% to 35% in Pakistani population. Studies have demonstrated GERD frequency is directly proportional to increasing weight. Thus, the frequency of obesity among gastro esophageal reflux disease patients was determined.

Methodology: This cross-sectional study was conducted on outpatients with GERD visiting Department of Hepatogastroenterology, Sindh Institute of Urology and Transplantation, Karachi; from December 2017 to June 2018. Clinical and demographic parameters of study population were recorded. Body mass index (BMI) more than 27 was labeled as obese. Patients with history of ischemic heart disease, pregnancy, ascites and/or Patients on NSAIDS, bisphosphonates or steroids were excluded.

Results: One hundred and fifty patients with mean age of 43.3±11.5 years were included in study. Eighty-seven patients (63.3%) had age more than 40 years. Majority of study population were males 95 (63.3%). Mean height and weight of study population were 163.09±9.56 cm and 72.92±15.13 kg, respectively. Mean BMI were 27.55±6.02 in which 71 (47.3%) were obese i.e., BMI >27. Majority were Urdu speaking i.e., 57 (38%) followed by Sindhi 31 (20%) Diabetes mellitus was documented in 22 (14.7%) and hypertension in 16 (10.7%) patients. Statistically significant association of GERD was seen in obese females (p-value: 0.018)

Conclusion: Increase frequency of obesity is significantly associated with GERD. More proportion of obese females has GERD.

Keywords: Gastro esophageal reflux disease; Body mass index; Weight; height

INTRODUCTION

Gastroesophageal reflux disease (GERD) is defined as distressing symptoms or complications that result from reflux of stomach contents(1). This disease may have typical or atypical presentation. In typical form, its principal symptoms are retrosternal burning sensation and regurgitation while in atypical form the patient presents mainly with extra-esophageal symptoms like cough, laryngitis, and asthma. Patient of GERD may present for the first time with chest pain(2,3). According to Dent *et al.*, (4) the prevalence of GERD is 10 to 20% worldwide, but certain studies done in Pakistan showed that its prevalence ranged from 24% to 35% (5,6). Shamail Zafaret *al.* from Pakistan,(7)demonstrated that the prevalence of GERD (heart burn and/or regurgitation) in obesity ranged from 10.2% to 22.1%. Hotmen Sijabat *et al.*,(8)demonstrated8.1 % prevalence of obesity among GERD in Indonesian population. Several meta-analyses demonstrate a link between body mass index (BMI), waist circumference and weight gain with symptoms and complication of GERD(9,10). Vaishnav B *et al.*,(11) demonstrated the prevalence, frequency and severity of symptoms of GERD increases with increase in the BMI.BMI is a key index for relating body weight to height. It is calculated by taking weight in kilograms (kg) divided by height in meters square (m²) (12). The incidence and prevalence of GERD have

increased markedly worldwide over the recent years, fairly in association with rise in obesity (13, 14).

So far only a single study has been performed to establish an association between frequency of GERD and obesity in Pakistan(15). Our study aimed to determine the frequency of obesity among GERD patients. While some studies show that increased waist circumference is strongly associated with GERD, others show that this association is not as significant as that with BMI (16,17). Similarly, weight loss has been shown to be significantly associated with improvement in GERD symptoms(18). Thus, this study would be helpful to establish the frequency of obesity among GERD patients in our population. By application of this study, life style modification can be advised to get rid of distressing symptoms of GERD, which in turn will be beneficial to community by decreasing the symptoms and improving the quality of life.

MATERIAL AND METHODS

This questionnaire-based cross-sectional study was conducted in the gastrointestinal (GI) outpatients' department of Sindh Institute of Urology and Transplantation, Karachi, from Dec. 2017 to June 2018. A total of 150 patients of both genders, between 20 and 70 years of age, having symptoms of GERD for more than the last four weeks, were included in the study by non-probability consecutive sampling. BMI was calculated by

taking weight in kilograms (kg) divided by height in meters square (m²) of all enrollees (12) and obesity was defined as body mass index (BMI) of equals or more than 27. (19) Those excluded from the study were either those who failed to give consent, GERD patients with alarm symptoms or with history cardiovascular diseases (ischemic heart disease), pregnancy, ascites due to any cause and Patients taking drugs like NSAIDS, bisphosphonates or steroids during last four weeks. Sample size was calculated 145 by using WHO calculator considering prevalence of obesity in GERD to be 8.1% in a population (8), a confidence level of 95% and margin of error 4.5%. Study was approved by institutional ethical review committee. All participants were interviewed by the researcher in the outpatient department of Hepatogastroenterology unit, SIUT Karachi. Written informed consent was obtained from all patients fulfilling inclusion criteria. A structured proforma was used to collect data.

SPSS (version 20.0) was used to enter data and analysis. Frequencies and percentages were computed for categorical variables like gender, co-morbidities (DM, HTN, Asthma) and presence of obesity (BMI equals to or more than 27). Quantitative values like age, weight, height and BMI were presented as mean ± standard deviation. Effect modifiers like age and gender were controlled through stratification. Post-stratification chi square test was applied. A p-value of ≤ 0.05 was considered as statistically significant.

RESULTS

A total of 150 patients were included in study, with mean age of 43.3 ± 11.5 years, majority were males 95 (63.3 %). Eighty seven patients (63.3 %) were older with age more than 40 and 63 (36.7 %) with age equals or less than 40 years, Mean height, weight and BMI were 163.09 ± 9.56 cm, 72.92 ± 15.13 kg and 27.55 ± 6.02 respectively. Out of 150 enrollees, 71 (47.3 %) were obese (BMI >27). (Baseline characteristics are shown in table 1). Almost 60% females were had higher BMI while majority of males were non obese with significant p value 0.018 (Table 2).

Table 1: Baseline characteristics of the study population.

Total number of patients	n=150
Age, Mean ±SD (Range)	43.3 ±11.5, (20-70)
Males, n (%)	95 (63.3%)
Females, n (%)	55 (36.7%)
Weight in Kg, Mean ±SD (Range)	72.92±15.13(45-117)
Height in centimeters, Mean ±SD (Range)	163±9.59(139-183)
BMI kg/m ² , Mean ±SD (Range)	27.55±6.02(16.7-44.8)
BMI> 27kg/m ² , n (%)	71(47.3%)
BMI≤ 27kg/m ² , n (%)	79 (52.7%)
Age >40 Years, n (%)	87 (58%)
Age ≤40 years, n (%)	63 (42%)
Co-morbidities	
Diabetes Mellitus, n (%)	22(14.7%)
Hypertension, n (%)	16 (10.7%)
Asthma, n (%)	13 (8.7%)
Other, n (%)	2 (1.3%)
Duration of symptoms	
Less than 6 months, n (%)	21(14%)
6months to 1 year, n (%)	59 (39.3%)
1Year to 5 years, n (%)	48(32%)
More than 5 years, n (%)	22(14.7%)

Ethnically, majority were Urdu speaking 57 (38%) followed by Sindhi 31 (20%) as shown in (Figure 1). Most of the participants did not have any co-morbidities, while DM was present in 22 (14.7%) participants followed by hypertension 16 (10.7%). Patients were divided in 2 age groups, majority of patients 87(58%) were older with age more than 40 years out of which 46 were obese and rest 63 (42%) with age 40 years or less out of which 25 were obese with p value of 0.110 (Table 2). Majority of patients 59(39.3%) had symptoms from 6 months to 1 year out of which 25 were obese with p value 0.691. (Table 2) Considering various ethnicities, different eating habits especially Urdu speaking use more spices data was analyzed in Urdu speaking and non-Urdu, Of total 57 urdu speaking only 25 were obese P value 0.306.

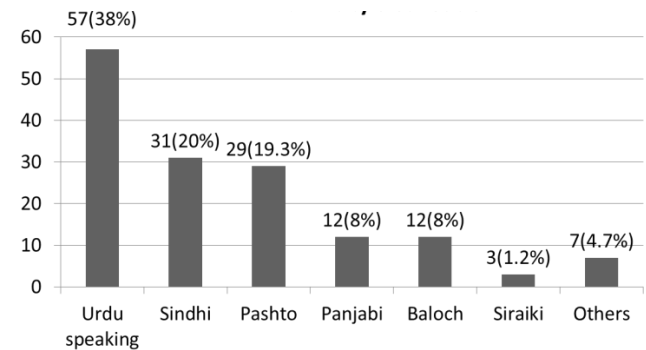


Figure 1: This graph shows the distribution of ethnicity among study population. (n=150)

Table 2: This table shows the association between different variables and BMI*

Variables	Body mass index		p value
	<27	≥27	
Gender (n; %)			0.018
Male	5	38	
Female	22	33	
Age Group (n; %)			0.110
≤ 40	38	25	
>40	41	46	
Duration of symptoms (n; %)			0.691
< 6 months	9	12	
6 months to 1 year	34	25	
1 year to 5 years	25	23	
>5 years	11	11	
Co-morbidity			0.001
Present, n=53	20	33	
Absent, n= 97	59	38	
Ethnicity			0.306
Urdu speaking	32	47	
Non Urdu	25	46	

DISCUSSION

According to Jafri *Net al.*, (4), the prevalence of GERD in Pakistan ranges from 24% to 35% (6). Gastroesophageal reflux symptoms (GERS) are very common in Asian population, with a prevalence extending from 50 to 70% (20). A meta-analysis demonstrated a dose-response correlation between BMI and the risk of reporting symptoms of GERD between both men and women (21). Shamail Zafar, *et al.*, (7), demonstrated the prevalence of GERD (heart burn and/or regurgitation) in obese individuals ranges from 10.2% to 22.1%. In this

study we reported 150 individuals with GERD of which obesity was found to be 47.3%. Crowell *et al.*, (22) observed more common upper and lower GI symptoms in overweight females visiting a weight management center compared to normal weight women enrolled from the community. Jacobson *et al.*, (23) conducted a study on a large cohort of female subjects also revealed the positive relation between reported GI symptoms and BMI. Furthermore, the author demonstrated that weight gain was linked with an increased risk of symptoms of GERD and weight loss decreases the risk. In our study population 60 % females had BMI more than 27. We documented statistical significant association of obese females with GERD (p value 0.018). Obesity is one of potential risk factors in pathophysiology of GERD. An analysis of 1,524 sample established that obesity (BMI > 30 kg/m²) is a strong risk factor in GERD incidence (24). Pathophysiology of GERD in obesity is considered as multifactorial. The etiology of increased incidence of GERD development in obesity has not been completely understood. It has been described that the lower esophageal sphincter tone is similar or a slightly low in patients with obesity compared to normal subject (25,26). Several meta-analyses demonstrate a link between body mass index (BMI), waist circumference and weight gain with symptoms and complication of GERD (9,10). Raised intra-abdominal pressure in obesity may cause development of GERD signs and symptoms. Such rise of intra-abdominal pressure may be resulted from deposition of body fat, especially in abdominal region. Accumulated body fat is also affected by certain hormonal factor, which is related with adipose tissue to play role in pathogenesis of GERD. However, the precise mechanism remains unclear (23). There is an increasing intragastric basal pressure in obesity compared to the normal control (27). Vaishnav B *et al* (11), demonstrated the prevalence, frequency and severity of GERD symptoms increases with rising BMI. BMI is a basic index for relating body weight to height. It is calculated by taking weight in kilograms (kg) divided by height in meters square (m²) (18). The incidence and prevalence of GERD have increased markedly worldwide over the recent years, fairly in association with rise in obesity (12,13). While Hotmen Sijabat *et al.* from Indonesia, (8) demonstrated the prevalence of obesity among GERD is 8.1 %. We reported 150 individuals with GERD in which 71 (47.3 %) patients were obese. The variation in the results can be attributed to difference in ethnicity and cut off of BMI. Considering various ethnicities, different eating habits especially Urdu speaking use more spices data was analyzed in Urdu speaking and non-Urdu, of total 57 Urdu speaking only 25 were obese P value 0.306 this analysis was performed keeping in view previous data by Butt *et al* that GERD was found in 70 of those who used spicy meals (28). Upper GI endoscopy was not performed due to exclusion of alarm symptoms as per national guidelines. (29) Patients with comorbidities like DM, HTN or asthma were associated more raised BMI having P value $p = 0.001$.

CONCLUSION

Increase frequency of obesity 47.3 % observed among gastro esophageal reflux disease patients. Female gender

and co morbidities i.e DM, HTN were associated more with Obesity and GERD.

REFERENCE

- Philip OK, Lauren BG, Marcelo F. Guidelines for the diagnosis and management of gastroesophageal reflux disease. *Am J Gastroenterol.* 2013;108:308-28.
- Atkins D, Briss PA, Eccles M, Flottorp S, Guyatt GH, Harbour RT *et al.* Systems for grading the quality of evidence and the strength of recommendations II: pilot study of a new system. *BMC Health Serv Res.* 2005 Mar 23;5(1):25.
- Vakil N, van Zanten SV, Kahrilas P, Dent J, Jones R; Global Consensus Group. The Montreal definition and classification of gastroesophageal reflux disease: a global evidence-based consensus. *Am J Gastroenterol* 2006;101:1900-20.
- Dent J, El-Serag HB, Wallander MA, Johansson S. Epidemiology of gastro-oesophageal reflux disease: a systematic review. *Gut* 2005;54:710-7.
- Karim S, Jafri W, Faryal A, Majid S, Salih M, Jafri F, *et al.* Regular post dinner walk; can be a useful lifestyle modification for gastroesophageal reflux. *J Pak Med Assoc.* 2011 Jun;61(6):526-30.
- Jafri N, Jafri W, Yakoob J, Islam M, Manzoor S, Jalil A, *et al.* Perception of gastroesophageal reflux disease in urban population in Pakistan. *J Coll Physicians Surg Pak.* 2005 Sep;15(9):532-4.
- Zafar S, Haque IU, Tayyab GU, Rehman AU, Rehman AU, Chaudhry NU. Correlation of gastroesophageal reflux disease symptoms with body mass index. *Saudi J Gastroenterol.* 2008 Apr;14(2):53-7.
- Sijabat H, Simadibrata M, Abdullah M, Syam AF. Gastroesophageal Reflux Disease in Obese Patients. *Indones J Gastroenterol Hepatol Dig Endosc.* 2008;9(1):10-15.
- Corley DA, Kubo A. Body mass index and gastroesophageal reflux disease: a systematic review and meta-analysis. *Am J Gastroenterol* 2006;101:2619-28.
- Hampel H, Abraham NS, El-Serag HB. Meta-analysis: obesity and the risk for gastroesophageal reflux disease and its complications. *Ann Intern Med* 2005;143:199-211.
- Vaishnav B, Bamanikar A, Maske P, Reddy A, Dasgupta S. Gastroesophageal Reflux Disease and its Association with Body Mass Index: Clinical and Endoscopic Study. *J Clin Diagn Res.* 2017 Apr;11(4):OC01-OC04.
- Nomura M, Tashiro N, Watanabe T, Hirata A, Abe I, Okabe T, *et al.* Association of symptoms of gastroesophageal reflux with metabolic syndrome parameters in patients with endocrine disease. *ISRN Gastroenterol.* 2014 Jan 30;2014:863206.
- Lee YC, Yen AM, Tai JJ, Chang SH, Lin JT, Chiu HM, *et al.* The effect of metabolic risk factors on the natural course of gastro-oesophageal reflux disease. *Gut* 2009;58:174-181.
- Tseng PH, Lee YC, Chiu HM, Huang SP, Liao WC, Chen CC, *et al.* Prevalence and clinical characteristics of Barrett's esophagus in a Chinese general population. *J Clin Gastroenterol* 2008;42:1074-9.
- Nisar S, Piracha S, Masud F. The frequency of gastroesophageal reflux disease among obese. *Pak J Med Health Sci* Oct-Dec 2010;4(4):455-9.
- Friedenberg FK, Rai J, Vanar V, Bongiorno C, Nelson D.B, Parepally M, *et al.* Prevalence and risk factors for gastroesophageal reflux disease in an impoverished minority population. *Obes Res Clin Pract.* 2010 Oct;4(4):261-69.
- El-Serag HB, Ergun GA, Pandolfino J, Fitzgerald S, Tran T, Kramer JR. Obesity increases oesophageal acid exposure. *Gut.* 2007 Jun;56(6):749-55.
- Park SK, Lee T, Yang HJ, Park JH, Sohn CI, Ryu S, *et al.* Weight loss and waist reduction is associated with

- improvement in gastroesophageal disease reflux symptoms: a longitudinal study of 15295 subjects undergoing health checkups. *NeurogastroenterolMotil.* 2017 May;29(5).
19. Hsu WC, Araneta MR, Kanaya AM, Chiang JL, Fujimoto W. BMI cut points to identify at-risk Asian Americans for type 2 diabetes screening. *Diabetes care.* 2015 Jan 1;38(1):150-8.
 20. Goh K. Changing epidemiology of gastroesophageal reflux disease in the Asian-Pacific region: An overview. *J Gastroenterol Hepatol.* 2004 Sep 1;19(s3).
 21. Hampel H, Abraham NS, El-Serag HB. Meta-analysis: Obesity and the risk for GERD and its complications. *Ann Intern Med.* 2005 Aug 2;143(3):199-211
 22. Crowell MD, Cheskin LJ, Musial F. Prevalence of gastrointestinal symptoms in obese and normal weight binge eaters. *Am J Gastroenterol.* 1994 Mar;89(3):387-91
 23. Jacobson BC, Somers SC, Fuchs CS. Body-mass index and symptoms of gastroesophageal reflux in women. *N Engl J Med.* 2006 Jun 1;354(22):2340-8.
 24. Locke GR 3rd, Talley NJ, Fett SL, Zinsmeister AR, Melton LJ 3rd.. Risk factors associated with symptoms of gastroesophageal reflux. *Am J Med* 1999; Jun;106(6):642-9.
 25. Iovino P, Angrisani L, Tremolaterra F, Nirchio E, Ciannella M, Borrelli V, et al. Abnormal esophageal acid exposure is common in morbidly obese patients and improves after a successful Lap-band system implantation. *Surg Endosc*2002; Nov 1;16(11):1631-5.
 26. O'Brien TF Jr. Lower esophageal sphincter pressure (LESP) and esophageal function in obese humans. *J Clin Gastroenterol.* 1980 Jun 1;2(2):145-8.
 27. Hou XH, Xie XP, Xu H, Chen JDZ. Exaggerated gastric accommodation in patients with obesity. *Gastroenterology* 2004;126;A481:T13
 28. Butt AK, Hashemy I. Risk factors and prescription patterns of gastroesophageal reflux disease: HEAL study in Pakistan. *J Pak Med Assoc.* 2014 Jul 1;64(7):751-7
 29. Niaz SK, Quraishy MS, Taj MA, Abid S, Alam A, Nawaz AA, et al. Guidelines on gastroesophageal reflux disease. *J Pak Med Assoc.* 2015 May 1;65(5):532-41.