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TO STUDY THE RISK FACTORS ASSOCIATED WITH GASTRO-ESOPHAGEAL REFLUX DISEASE

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Abstract:

Objective: *Gastro-esophageal reflux disease (GERD) is one of the commonly known disorders in upper gastrointestinal tract[1]. GERD has been observed in an increasing extent in Europe as well as United States of America. Aim of the study was to determine the risk factors associated with Gastro-esophageal reflux disease (GERD), in a tertiary care Hospital of Karachi.*

Study Design: *Prospective, cross sectional study*

Place and Duration of Study: *This study was conducted at the Department of Internal Medicine and Gastroenterology, Mayo Hospital Lahore from April 2019 to April 2020.*

Materials and Methods: *Attendants of patients sitting in the waiting area with no comorbid, and who were non-smoker and non-alcoholic were recruited after taking informed consent. Data was entered in given performa. Logistic regression was applied with 95% confidence interval.*

Results: *Total 2191 participants were included in our study. 1130 patients (51.6%) were males and 1061 (48.4%) were females, with mean age of 33.92±12.36 years. GERD symptoms were present in 760 patients (34.7%). GERD symptoms were common in patients taking spicy meals (37.2%) and in urdu speaking ethnic group (52.5%). In those who had a high waist hip ratio, 0.9 +-0.15 waist height ratio 0.52+-0.07 and waist circumference ratio 84.57+-10.92.*

Conclusion: *Gastro-esophageal reflux disease is common in our population and there is significant inverse association of GERD with Waist hip ratio and waist height ratio.*

Keywords: *Gastro-esophageal reflux disease, body mass index.*

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INTRODUCTION:

Gastro-esophageal reflux disease (GERD) is one of the commonly known disorders in upper gastrointestinal tract [1]. GERD has been observed in an increasing extent in Europe as well as United States of America [2,3].The symptoms of GERD are considered as the most common symptoms among the gastrointestinal symptoms in the regions as mentioned earlier with the occurrence of 10-25% as indicated by the different population based studies [4]. The occurrence of Gastro esophageal reflux disease <5% is reported for Asia [5]. Literature from Iran indicates same rate of prevalence of GERD which have been reported for the western countries [6]. GERD can be categorized on the basis of typical, atypical and esophageal symptoms. Typical symptoms include heart burn, regurgitation and dysphagia the atypical symptoms include cough and wheezing, hoarseness, sore throat, otitis media, non-cardiac chest pain, enamel erosion or dental manifestations. The treatment is based on lifestyle modifications and control of gastric acid secretion through medical therapy with proton pump inhibitors and antacids or through corrective anti-reflux surgery [7].

Contributing factors of GERD have been examined in the population generally as reported by various studies but some of potential contributing factors have indicated different results [8,9]. The data from the developing and under developed countries have been obtained in limited amount and only few population based studies have been conducted which present the determinants of GERD [10]. This study is aimed to investigate the contributing factors of Gastro esophageal reflux disease (GERD). A potential unit of around 2290 volunteers was recruited in a tertiary care hospital of Karachi, Pakistan. Data was analyzed on the basis of frequency, perceived severity of symptoms and the time of first occurrence of GERD symptoms.

MATERIALS AND METHODS:

Single center Prospective, cross sectional study was conducted in Mayo Hospital Lahore, for the duration of one year from April 2019 to April 2020. Patients were recruited after taking informed consent and were above 18 years of age present in outpatient clinic of the various section of hospital having no history of comorbid such as; diabetes, ischemic heart disease, hypertension, stroke, and renal diseases and were nonsmokers and non addicts with no history of taking beta-blocker, aspirin or NSAIDS within the duration of last 6 months. This study was conducted by the team of trained doctors and medical students who explained everything to the respondents in the case of any confusion. Patients were inquired about GERD and screening questions were asked from them i.e. presence of retrosternal burning, burning of throat`s back, sour / bitter taste, symptoms of GERD after meal, simultaneously, they were asked about the symptoms of GERD two or more than two times in week. Two or more "Yes" for asked questions was interpreted as the presence of symptoms of GERD. On the basis of presence or absence of gastro-esophageal reflux symptoms (GERD) the respondents were divided into two groups. The variables i.e. age, gender, geographical background, education, eating habits, frequency of meals, GERD symptoms, BMI, hip waist circumference, hip waist ratio, height waist ratio were recorded by the researcher on already designed Performa/questionnaire . The questionnaire was already validated and as well as translated in local language for the study which was conducted at the department of gastroenterology (medicine) in 2005 at Agha Khan University Hospital [11]. Exclusion criteria were strictly followed so that the confounding variables could be avoided.

Statistical analysis:

The obtained data was analyzed by using the commonly used software i.e. statistical package for social sciences (SPSS) version 22. At the very first the descriptive statistics was used for the analysis. Frequency distribution i.e. counts and percentages were reported. The whole data was presented by using the mean $\pm$ standard deviation. The level of statistical significance of comparison of means was investigated by using chi square and t-test and Fisher`s exact formula. 5% statistical significance i.e. p—value = 0.05 was considered.

RESULTS:

Total 2191 participants were included in our study. 1130 patients (51.6%) were male and 1061 (48.4%) were females, with mean age of 33.92$\pm$12.36 years.

In our study GERD symptoms were present in 760 patients (34.7%), as shown in Table-1

Table No.1: Frequency distribution of total number of study participants and gender

Total number of study participants	Frequency (n)	Percentage (%)
Gerd present	760	34.7%
Gerd not present	1431	65.3%
Gender		
Male	1130	51.6%
Female	1061	48.4%

Table No. 2: Frequency distribution of age, bmi, waist hip ratio, waist height ratio and waist circumference

Variables	Min.	Max.	Mean+sd
Age years	18	87	33.92±12.36
Bmi	18	41.88	24.09±3.98
Waist hip ratio	0.67	3.95	0.90±0.15
Waist height ratio	0.36	0.92	0.52±0.07
Waist circumference ratio	66	140	84.57±10.92

Table No. 3: Frequency distribution of ethnicity, education level and occupation

Ethnicity	Frequency (n)	Percentage(%)
Punjab	351	16%
Sindh	332	15.2%
Kpk	256	11.7%
Urdu speaking	1150	52.5%
Balochistan	111	4.8%
Education level		
Graduate	1068	48.7%
Inter pass	320	14.6%
Middle pass + matriculation	415	18.9%
Illitrate	388	17.7%

Table No.4: Frequency distribution of frequency of GERD symptoms

Uncomfortable feeling behind the sternum	Frequency (n)	Percentage (%)
Yes	944	43.1%
No	1247	56.9%
Burnining back of throat		
Yes	528	24.1%
No	1663	75.9%
Bitter taste of mouth		
Yes	577	26.3%
No	1614	73.3%
Symptoms after meal		
Yes	856	39.1%
No	1335	60.9%
Two or more times gerd symptoms/week		
Yes	460	21%
No	1731	79%
Temporary relief with proton pump inhabitor and h2 receptor blocker		
Yes	507	23.1%
No	1684	76.9%

The majority of subjects 1150 (52.5%) included in our study were Urdu speaking people, 351 (16%) were Punjabi, 332 (15.2%) were Sindhi, 256 (11.7%) were pathan and 111 (4.8%) were Balochi as in table I.

Regarding education status in our study, majority of patient were 1068 (48.7%) were graduate, 388 (17.7%) were illiterate, 320 (14.6%) were intermediate pass and 415 (18.9%) were middle pass / matriculation pass. The mean BMI was 24.09±3.98 kg/m^2, the mean Waist hip ratio was 0.90±0.15 cm, the mean Waist height ratio was 0.52±0.07cm and the mean waist circumference ration was 84.57±10.92 cm as shown in table 2.

History of fixed meal was observed in 706 patients (32.2%), spicy meal 816 (37.2%), cold drink in 158 (7.2%) and history of chocolate was seen in 80 patients (3.7%), as shown in Table-5.

GERD symptoms e.g. uncomfortable feeling behind breast bone moving upward were observed in 944 (43.1%) patients, burning back of throat in 528 (24.1%), bitter taste in mouth in 577 (26.3%), symptoms after meal in 856 (39.1%), as shown in Table-4. Two or more time GERD symptoms per week were observed in 460 patients (21%), temporary relief with medicine was observed in 507 (23.1%), as shown in Table-4.

GERD symptoms were more common in graduates and in Urdu speakers and patients taking spicy meals. GERD is significantly associated with increased Waist hip ratio and waist height ratio.

Table No. 5: Frequency distribution of aggregating factors

Aggregating factors		
Fixed meal	**Frequency (n)**	**Percentage (%)**
Yes	706	32.2%
No	1485	67.8%
Spicy meal		
Yes	816	37.2%
No	1375	62.8%
Cold drink		
Yes	158	7.2%
No	2033	98.8%
Chocolate		
Yes	80	3.7%
No	2111	96.3

Table No. 6: Frequency distribution of GERD

	Univariate analysis		**Multivariate analysis**	
BMI	**Confidence Interval (Ci)**	**P-value**	**Confidence interval(ci)**	**P-value**
18-23	**1**		1	
23-25	1.25(0.99-1.56)	0.051	1.11(0.88-1.4)	0.39
>25	1.70(1.38-2.09)	0.001	1.15(0.88-1.51)	0.32
Waist circumference				
≤90 cm	1		1	
91-100 cm	1.24(0.97-1.60)	0.09	0.74(0.55-1.01)	0.06
≥ 101	1.90(1.41-2.54)	0.001	0.91(0.58-1.42)	0.66
Waist hip ratio				
≤0.90	1		1	
0.91-1.00	1.47(1.22-1.77)	0.001	1.38(1.14-1.68)	0.001
≥1.01	2.35(1.71-3.80)	0.001	2.15(1.42-3.25)	0.001
Waist height ratio				
≤0.50	1		1	
0.51-0.6	1.67(1.38-2.02)	0.001	1.59(1.24-2.02)	0.001
≥0.61	2.16(1.63-2.87)	0.001	2.06(1.30-3.27)	0.002

DISCUSSION:

GERD is an unremitting disease of multi-factorial etiology in which genetic and environmental factors play a pivotal; role. It was shown in global studies that different anthropometric measurements were studied for GERD, that included Hip circumference grips, BMI, Waist circumference grips along with other factors like Age, Education level, Socioeconomic status. In most but not in all studies [11],12. positive relation between GERD and age have been kept under consideration. The relationship between GERD symptoms and gender are mixed in present evidences. But in most of the studies this association has not been shown [13]. In our study GERD symptoms were present in 34.7% patients actively employed in a job as compare to 18.1% prevalence of GERD symptoms in another study. No association was found with socioeconomic conditions in our study as compared to a previously conducted study which indicated association between GERD symptoms and the socioeconomic status [14]. In our study GERD symptoms were common in graduates which is similar to one pervious study showing the prevalence of the GERD symptoms greater in the respondents having higher educational level; it was 34.1% in the graduate respondents. The association of both was highlighted as the inverse association; especially for those respondents with lower educational level[15].This association can be explained by the fact that the greater the educational level of an individual more will be the level of perception of stress by these individuals, secondarily these people are more likely to be employed in sedentary desk jobs. In our study GERD symptoms were seen more in males (20.5%) as compared to females (15.2%), the previous literature did not highlight any difference regarding the relationship of GERD and obesity in terms of gender [23]. In relation to age (17.6%) observed in age group of 31-50 years. This is the most active age group where an individual is exposed to more stress as well as the body starts losing the lithe form and tends to accumulate abdominal fat.

Higher prevalence of GERD symptoms i.e. 23% were documented in the respondents with body mass index (BMI) i.e. 23-27.4 kg/m2. Those Respondents having overweight and normal BMI, GERD was commonly found as compared to patients with BMI above 28, high lighting the fact that overall obesity is not as important a risk factor than central obesity this is in accordance with another study which showed that central obesity seemed a more important factor than overall obesity [18]. However, many previously conducted studies have indicated the relationship between GERD symptoms and higher level of BMI [16, 17]. Increased inner abdominal pressure probably is the explanation of relationship of GERD with body mass index (BMI) and especially central obesity [19,21]. Although, other mechanisms also seemed to be there which contribute in this relationship i.e. lower pressure of esophageal sphincter in fat individuals [20,21]. Exposure of esophageal acid has been positively correlated with body mass index (BMI) [20] as well as waist circumference [22]. The clear relationship of GERD and obesity has been indicated in the western countries [23]. But in this study the relationship between generalized obesity and GERD was not found. Inconsistent results have been concluded from the population based studies of China on the relationship between GERD and BMI [24].The association of GERD and abdominal fat was assessed in the study conducted by Chen et al; but no significant relationship between central obesity and reflux symptoms was found [25]. However, our study is showing only association of central obesity with GERD rather than generalized obesity This study found the significant inverse association between GERD symptoms with waist hip ratio and waist height ratio. More longitudinal studies on this issue are required to be conducted.

CONCLUSION:

In conclusion GERD is common in our population and there is significant inverse association of GERD with Waist hip ratio and Waist height ratio. Thus abdominal obesity rather than generalized obesity was more prominent risk factor in our population.

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