Original Article

Anthropometric Modification can be Useful for Gastro-Esophageal Reflux Disease Symptoms; which Parameter should be Targeted Most? In a Tertiary Care Hospital at Karachi

Shahid Karim, Hamid Ali, Syeda Nosheen Zehra, Afsheen Faryal, Tanveer Khalid and Ghulam Mujtaba

ABSTRACT

Objective: To find out the anthropometric modification can be useful for gastro-esophageal reflux disease symptoms; which parameter should be targeted most? in a tertiary care Hospital at Karachi.
Study Design: Cross sectional study.
Place and Duration of Study: This study was conducted at the Department of Gastroenterology, Liaquat National Hospital & Medical College, Karachi from February 2009 to March 2010
Materials and Methods. Relative sitting of patients were included in the study with no co morbid, non-smoker and non-alcoholic patients. Questionnaires were got filled from them. Logistics regression of the anthropometric measures was computed with the 95% confidence interval.
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+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 speakers (52.5%).
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.
Key Words: Anthropometric modification, Gastroesophageal reflux disease, body mass index

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INTRODUCTION

Gastroesophageal reflux disease (GERD) is one of the commonly known disorders in upper gastrointestinal tract[1]. GERD has been observed up to an increasing extent in Europe as well as United States of America[2,3]. The symptoms of GERD are the 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].

Department of Gastroenterology, Liaquat National Hospital & Medical College, Karachi.

Correspondence: Dr. Dr Shahid Karim, Department of Gastroenterology, Liaquat National Hospital & Medical College, Karachi.
Contact No: 03048060786
Email: Shahidkarim381@gmail.com

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The tremendous literature from Iran indicates that same rate of prevalence of GERD which have been reported for the western countries[6,7]. DERD can be marked among the different symptoms which can be categorized into the different categories i.e. typical, atypical and esophageal symptoms. Symptoms which are having the greater specificity for GERD are known as the acid regurgitation and heartburn. When the hard symptoms are absent these can permit to conduct the presumptive diagnosis and start the empiric therapy. In the some situations, more diagnostic testing is required for the confirmation of diagnosis and as well as for the assessment of probable causes of the symptoms.

Contributing factors of GERD have been examined in the population generally as reported by the various studies but some of potential contributing factors have indicated the different results[8,9]. The data from the developing and under-developing countries have been obtained in the limited amount and 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) with the cross-sectional analysis of standard data from the Golestan

Cohort study, a potential unit of around 2290 people at Karachi, Pakistan. Data was analyzed on the basis of frequency, perceived severity of patient and the time of first occurrence of GERD symptoms.

MATERIALS AND METHODS

Potential, analytical, cross-sectional and multi-center Prospective, cross sectional analytical study was conducted from the duration of February 2009 to March 2010. The population of the study was the respondents of age of 18 years and their relatives with age above 18 years arriving at the outpatient clinic of the various section of the tertiary hospital having no history of co morbid before such as; diabetes, ischemic heart diseases, hypertension, stroke, and renal diseases. The respondents were selected randomly by the help of chart which is generated by computer, the subjects were screened and were also considered as potential for the study. The responses were taken from them with their consensus. Respondents having the history of acid peptic disease, smoking, chronic liver disease, alcohol or history of drugs such as Beta-blocker Aspirin, NSAIDS or any other drugs within the duration of last 6 months) or those respondents who were having any of the mentioned comorbids were excluded from the study. For the conduction this study, the respondents were provided with questionnaire i.e. "Ritcher Acid Scale"[11]. 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].

The questionnaire survey was conducted by the team of trained volunteers they explained everything to the respondents in the case of any confusion. In the designed questionnaire respondents 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 gastroesophageal reflux symptoms (GERD) the respondents were divided into two groups.

Questionnaire was included with the demographics i.e. gender, age, cultural background (the province of Pakistan), and qualification (illiterate, 5th, 8th, 10th, 12th, graduation). The age was categorized into three groups in order to observe the relationship of age and GERD symptoms: the groups of age were as; a <30 years, b) 31-50 years and c) > 50 years. The body mass index of the respondents was also calculated.

This study was approved to be conducted by the Ethical Board Review Committee of Agha Khan University hospital Karachi, Pakistan. All the data i.e. demographics and the clinical history were recorded by the researcher on already designed questionnaire. The responses were taken from the respondents after their consensus. Exclusion criteria was 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. count and percentage were reported. The whole data was presented by using the mean + 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 2297 participants were included in our study. 1167 patients (50.8%) were male and 1130 (49.2%) were females, with mean age of 34.48$\pm$12.594 years, as shown in Table-1 & Table-2.

The majority of subjects 1203 (52.4%) included in our study were Urdu speakers, 368 (16%) were Punjabi, 345 (15%) were Sindhi, 270 (11.8%) were Pathan and 111 (4.8%) were Balochi as shown in table 3.

Regarding education status in our study, majority of patient were 1105 (48.1%) were graduate, 417 (18.2%) were illiterate, 332 (14.5%) were intermediate pass and 443 (19.3%) were middle pass plus matriculation pass, as shown in Table-3.

In our study the mean BMI was 24.1386$\pm$4.02156 kg/m2, the mean Waist hip ratio was 0.90$\pm$0.15 cm, the mean Waist height ratio was 0.5170$\pm$0.07027 cm and the mean waist circumference ratio was 84.9$\pm$10.95 cm as shown in table 2.

Regarding aggravating factors history of fried meal was observed in 767 patients (33.4%), spicy meal 881 (38.4%), cold drink in 168 (7.3%) and history of chocolate was seen in 83 patients (3.6%), as shown in Table-5.

Regarding GERD symptoms, uncomfortable feeling behind breast bone moving upward were observed in 1008 (43.9%) patients, burning back of throat in 567 (24.7%), bitter taste in mouth in 607 (26.4%), symptoms after meal in 921 (40.1%), as shown in Table-4

Two are more time GERD symptoms per week were observed in 507 patients (22.1%), temporary relief with medicine was observed in 554 (24.1%), as shown in Table-4.

In our study GERD symptoms were present in 822 patients (35.8%), as shown in Table-1

GERD symptoms were more common in graduates and in Urdu speakers and patients taking spicy meals. GERD is significantly associated with Waist hip ratio (p-value 0.001) and waist height ratio (p-value 0.001).

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

Total number of study participants	Frequency (n)	Percentage (%)
GERD present	822	35.8%
GERD not present	1475	64.2%
Gender: Male	1167	50.8%
Female	1130	49.2%

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	74	34.48±12.594
Bmi	18	48.40	24.1386±4.02156
Waist hip ratio	0.67	3.95	0.90±0.15
Waist height ratio	0.36	1.34	0.5170±0.07027
Waist circumference ratio	56	140	84.9±10.95

Table No.3: Frequency Distribution of Ethnicity, Education Level and Occupation

Ethnicity	Frequency (n)	Percentage (%)
Punjab	368	16%
Sindh	345	15%
Kpk	270	11.8%
Urdu speaking	1203	52.4%
Balochistan	111	4.8%
Education level		
Graduate	1105	48.1%
Inter pass	332	14.5%
Middle pass + matriculation	443	19.3%
Illitrate	417	18.2%

Table No.4: Frequency Distribution of Frequency of Gerd Symptoms

Uncomfortable feeling behind the sternum	Frequency (n)	Percentage (%)
Yes	1008	43.9%
No	1289	56.1%
Burning back of throat		
Yes	567	24.7%
No	1730	75.3%
Bitter taste of mouth		
Yes	607	26.4%
No	1690	73.6%
Symptoms after meal		
Yes	921	40.1%
No	1376	59.9%
Two or more times gerd symptoms/week		
Yes	507	22.1%
No	1790	77.9%
Temperory Relief With Proton Pump Inhabitor And H2 Receptor Blocker		
Yes	554	24.1%
No	1743	75.9%

Table No.5: Frequency Distribution of Aggregating Factors

Aggregating factors		
Fried meal	frequency (n)	percentage(%)
Yes	767	33.4%
No	1530	66.6%
Spicy meal		
Yes	881	38.4%
No	1416	61.6%
Cold drink		
Yes	168	7.3%
No	2129	92.7%
Choclate		
Yes	83	3.6%
No	2214	96.4%

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 disease is an unremitting disease of multi-factorial etiology in which genetic and environmental factors keep pivotal; role. It was shown in global studies that different anthropometric events were applied for GERD, that included Hip Circumference Grips, BMI, waist circumference grips and other multiple factors were concerned with GERD as like education level, society. In most but not in all studies[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 35.8% patients as compare to 18.1% prevalence of GERD symptoms was found in the study among those respondents who were doing job. One previously conducted study indicated the relation between GERD symptoms and the socioeconomic status of the other populations[14].

It is also indicated such relation even after the adjustments for certain other causes of GERD. In our study GERD symptoms were common in graduates which is similar to one previous study showing the prevalence of the GERD symptoms was 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; because education is often started and finished in early age before the initiation of GERD[16].

The prevalence of GERD symptoms was greater i.e. 23% 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. Many previously conducted studies have indicated the relationship between GERD symptoms and higher level of BMI[17]. In this association, central deposit seemed as more important factor as compared to overall obesity[18]. The relation between the obesity and GERD is considered as the causal i.e. exposure-response which have been indicated in the various studies[17].

Increased inner abdominal pressure probably come in the explanation of relationship of GERD with body mass index (BMI) and especially central obesity[19,20]. Although, other mechanisms are also seemed to be there which contribute in this relationship i.e. lower pressure of esophageal sphincter in fat individuals[20]. Exposure of esophageal acid has been positively correlated with body mass index (BMI) in any case[20] and as well as waist circumference[21]. The clear relationship of GERD and fatness has been indicated in the western countries[22]. But in this study the relationship between 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[23]. The association of GERD and abdominal fatness was assessed in the study conducted by Chen et al; but no significant relationship between central obesity and reflux symptoms was found[24].

In our study GERD symptoms were seen more in males (20.5%) as compared to females (15.2%), observed more commonly (17.6%) in age group of 31-50 years. The association of high BMI and central obesity in women were reported to be associated with symptoms of GERD in the study conducted by Islami et al[15]. Whereas, in men daily symptoms were associated with the central obesity: but the significant association of BMI, waist to hip ratio was not found. The previous literature did not highlighted any difference regarding the relationship of GERD and obesity in terms of gender[20]. Variation in the results is not clear but some speculations explained the risk factors which probably be common in men by which they may minimize the apparent effect of fatness.

This study found the significant inverse association between GERD symptoms with waist hip ration and waist height ratio. More longitudinal studies on this issue are required to be conducted.

Study Strength and limitation:

Greater number of questionnaire samples was collected from the respondents which contained the detailed information of the symptoms of GERD and the other contributing factors are counted to be the strengths of this study. Lack of the data regarding the endoscopic and histological damage related with GERD was considered as the limitation of the study. Although, GERD as the clinical diagnosis in most of the instances particularly in the setting of primary care and its symptoms are considered as the common cause of discomfort level irrespective of the presence and absence of histological and endoscopic outcomes; Investigation of sources of GERD has indicated the clinical implication.

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. GERD symptoms were common in Urdu speakers, graduates and patients who were taking spicy meals.

Author's Contribution:

Concept & Design of Study:	Shahid Karim
Drafting:	Hamid Ali, Syeda Nosheen Zehra
Data Analysis:	Afsheen Faryal, Tanveer Khalid, Ghulam Mujtaba
Revisiting Critically:	Shahid Karim
Final Approval of version:	Shahid Karim

Conflict of Interest: The study has no conflict of interest to declare by any author.

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