Prevalence of symptom-defined gastroesophageal reflux disease among general population of Herat, Afghanistan - A cross sectional study

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Abstract

Background: Gastroesophageal Reflux Disease (GERD) is a chronic digestive ailment that is characterized by the regurgitation of stomach contents back into the esophagus. This cross-sectional study aims to estimate the prevalence of symptom-defined GERD and their correlation with age and BMI among the general population of Herat city, Afghanistan.

Methods: This cross-sectional study was conducted among the general population of Herat city of Afghanistan from March 1st, 2021 to March 25th, 2021. A respective sample of 400 adults participated in this study. Different variables were collected using a questionnaire developed. Data were evaluated in the IBM SPSS program.

Results: 61.8% of the participants were aged between 18 to 34 years old. 59.3% of the participant's body mass index (BMI) was found to be normal and healthy. 50.5% of the participants were male and 41.3% of the participants responded that they have digestive problems. 42.5% of the participants had heartburn, 31.5% of the participants responded that they usually experience stomach acid coming up. 32.5% of the participants said that they have chest pain while 36.8% of the participants responded that they have indigestion problems.

Conclusion: The result of this study shows that the prevalence of symptoms-defined GERD among the general population of Herat province of Afghanistan is higher than in many countries in the world. A significant association was found between heartburn and chest pain with the age groups. Also, a significant association was found between the indigestion symptoms of GERD and the BMI of the participants.

Introduction

Gastroesophageal Reflux Disease (GERD) is a chronic digestive ailment characterized by the regurgitation of stomach contents back into the esophagus (1). There is no direct cause known for the occurrence of GERD. The pathogenesis of GERD is ascribed to motor abnormalities such as esophageal dysmotility, which causes decreased esophageal acid clearance, impairment in the tone of the lower esophageal sphincter (LES), transitory LES relaxation, and delayed gastric emptying (2). In this disease, the patients suffer from an uncomfortable burning feeling in their chest, also called heartburn that sometimes spreads towards the neck. It may lead to other symptoms like difficulty or pain when swallowing, sudden excess of saliva, chronic sore throat, laryngitis or hoarseness, Inflammation of the gums, Cavities, Bad breath, recurrent or chronic cough. Everyone has experienced gastroesophageal reflux at some point in their lifetime. It occurs while a person burps (3).

Based on histopathologic and endoscopic appearance, GERD is classified into three phenotypes: erosive esophagitis (EE), non-erosive reflux disease (NERD), and Barrett's esophagus (BE). NERD is the most common type observed in 60–70% of patients, followed by EE and BE in 30% and 6–12% of GERD patients, respectively. The prevalence of GERD is slightly more common in men than in women. On the other hand, women with GERD symptoms are more likely to have NERD than males who have erosive esophagitis (4).

Other reported factors associated with GERD are Age, body mass index (BMI), and smoking. It affects all ages, from infants to older adults (5). Hiatal hernia is usually linked to GERD, though it can also exist without causing symptoms. The persistence of hiatal hernia contributes to the development of GERD by hindering the LES function (6). Dietary factors associated with GERD are eating spicy foods, hot or fried food. Lifestyle factors include alcohol consumption, anxiety, and lying down after eating. Genetic factors include prevailing family history and GI diseases in immediate family members. Certain drugs have been associated with GERD, including theophylline, NSAIDs, etc. Asthma has been

implicated in GERD as well. It increases the risk of developing GERD. Asthma medications can worsen GERD symptoms (7).

GERD is a significant health concern that adversely affects the patient's quality of life. This condition can cause vomiting, coughing, and breathing disorders (8). This disease, if left untreated, can lead to life-threatening and severe complications such as esophageal stricture, permanent changes to the lining of the esophagus, gastrointestinal bleeding, and esophageal cancer. Medical treatment includes the administration of certain drugs like PPIs (Proton pump inhibitors), H2 blockers, Antacids. Lifestyle changes can help improve the symptoms, for example, quitting smoking, losing excess weight, eating smaller meals, chewing gum after eating, avoiding lying down after eating, avoiding foods and drinks that trigger your symptoms, avoiding the wearing of tight clothing, and practicing relaxation techniques, etc. (9).

Almost half of all adults experience reflux symptoms at some point in their lives (10). In western countries, its prevalence ranges from 10 to 20% of the population. The number of cases is on the rise in Middle East countries (11). In Afghanistan, the true and latest number of patients with GERD is not known due to the scarcity of data and few types of research conducted on this disease. However, a systematic review conducted in 2017 on the prevalence of GERD in 195 countries and territories across the globe estimated that the number of GERD cases in Afghanistan has increased from 866,025 in 1990 to 2,484,705 in 2017 (12).

This cross-sectional study aims to estimate the prevalence of symptom-defined GERD and their correlation with age and BMI among the general population of Herat city, Afghanistan.

Materials And Methods

This cross-sectional study was conducted among the general population of Herat city, Afghanistan, from March 1st, 2021, to March 25th, 2021. Herat city is the center of the Herat province of Afghanistan. Based on the data provided by the National Statistics and Information Authority, the city has a total population of 672,616 (13).

Participants of this study included both males and females aged between 18 years old to 98 years old who were living in Herat city during the study. A simple random sample method was used to select participants and collect data. Only the participants who were willing to continue to answer the whole items in the questionnaire were included in the study. A total of 400 participants participated in this study. Non-volunteers and healthcare workers were excluded from this study.

To find the prevalence of gastroesophageal reflux disease's symptoms among the general population of Herat city, we developed a questionnaire in Dari language by literature review. Dari is one of the most commonly used languages to communicate in Herat, Afghanistan (14).

The final Dari questionnaire contained 19 items divided into two sections. The first section contained 9 items used to collect participant's socio-demographic data. The items were: Age, Weight, Height, Gender, Marital status, Economic status, Presence of chronic disease, Presence of digestion system disease, Taking the drug for the digestive system disease. The second section contained 10 items to collect information on primary and general symptoms of GERD and its related risk factors. The items were: "Do you eat fried foods?", "Do you take beverage drinks?", "Do you always eat hot foods?", "Are you gaining weight lately?", "After taking the meal, do you sleep on your back immediately?", "Do you experience heartburn for 30–60 minutes after taking your meal?", "Do you feel the sore taste in your mouth?", "Do you have chest pain?" and "Do you have a problem with digesting food?". A pilot study was conducted among 30 male and female participants. The questionnaire needed minor changes in using Dari expressions for a better understanding

of participants. Three volunteer medical students were trained for three hours in one day so that they can understand how to interact and demonstrate the questions to the participants. They have interviewed the participants and collected data from 400 participants.

In the first section of the questionnaire, the Age item had three categories: 18–34 years old, 35–54 years old, and > 54 years old. The Weight and Height items were used to calculate the body mass index (BMI) using the standard formula $[\text{Weight}/(\text{Height} \times \text{Height})]$ where Weight is evaluated in kilogram and Height is evaluated in meter and was represented in four categories: Underweight, Normal or healthy Weight, Overweight, and Obese. The Gender item had two categories: Male and Female. The Marital status item was represented by three categories: Single, Married, and Widow. The Economic status item had three categories: High income, Medium or low income, and very low income. The Digestive problems presence and The Presence of chronic disease had two types: Yes, and No. All of the items in the second section had three categories: Usually, Sometimes, and Never.

The collected data were entered into IBM SPSS version 24.0 software for windows. Categorical variables were presented in numbers (N) and percentages (%). The Chi-square test was used to observe the difference between different categories. The confidence level was considered 95%.

This study was approved by AMSA Medical Research Center Ethical Committee on 02/20/2021. The anonymity of respondents was ensured.

Results

Four hundred people participated in this study. 61.8% of the participants were aged between 18 to 34 years old, and 30.7% were aged 35 to 54. 10.0% of the participants were underweight, 59.3% were calculated as normal and healthy, and 20.4% were overweight. 50.5% of the participants were male, 52.5% of them were single, and 4.2% were widows. 10.5% of the participants responded that they have a high income, and 82.0% responded that they have medium or low income. 41.3% of the participants responded that they have digestive problems. While 6.3% of the participants responded that they have a chronic disease. Table 1

Table 1
Characteristics of participants

Characteristic	Category	N	(%)
Age group	18–34 years	247	61.8
	35–54 years	123	30.7
	> 54	30	7.5
BMI	Underweight	40	10.0
	Normal and healthy weight	237	59.3
	Overweight	82	20.4
	Obese	41	10.3
Gender	Male	202	50.5
	Female	198	49.5
Marital status	Single	210	52.5
	Married	173	43.3
	Widow	17	4.2
Economic status	High income	42	10.5
	Medium to low income	328	82.0
	Very low income	30	7.5
Digestive problems presence	Yes	165	41.3
	No	235	58.7
Presence of chronic disease	Yes	25	6.3
	No	375	93.7
Total		400	100.0

In the risk factors section, 65.0% of participants responded that they usually eat fried foods. 61.5% of the participants usually consume fizzy drinks. 52.2% of the participants responded that they usually eat hot food. 37.5% of the participants responded that they are gaining weight lately. 26.5% of the participants responded that they sometimes sleep again after eating food. 51.8% of the participants responded that they usually rest immediately after eating. In the symptoms section, 42.5% of the participants had heartburn, 31.5% of the participants responded that they usually experience stomach acid coming up. 32.5% of the participants said they have chest pain, while 36.8% of them responded that they have indigestion problems.

Table 2
Severity of gastroesophageal symptoms and its risk factors

Variables	Category	N	(%)
Eat fried foods	Usually	260	65.0
	Sometimes	56	14.0
	Rarely	84	21.0
Consume fizzy drinks	Usually	246	61.5
	Sometimes	56	14.0
	Never	98	24.5
Eat hot food	Usually	209	52.2
	Sometimes	91	22.8
	Never	100	25.0
Gaining weight	Usually	150	37.5
	Sometimes	109	27.2
	Never	141	35.3
Sleep on back after eating food	Usually	148	37.0
	Sometimes	106	26.5
	Never	146	36.5
Rest immediately after eating	Usually	207	51.8
	Sometimes	69	17.2
	Never	124	31.0
Heartburn	Usually	170	42.5
	Sometimes	119	29.7
	Never	111	27.8
Stomach acid coming up	Usually	126	31.5
	Sometimes	150	37.5
	Never	124	31.0
Chest pain	Usually	130	32.5
	Sometimes	87	21.8
	Never	183	45.7
Indigestion	Usually	147	36.8
	Sometimes	93	23.2
	Never	160	40.0

Variables	Category	N	(%)
Presence of symptoms	Complete	141	35.2
	Partial	247	61.8
	None	12	3.0
Total		400	100.0

In 18–34 years old participants of this study, only 23.9% of the participants did not experience heartburn, 27.1% of them did not experience stomach acid coming up, 48.6% never experienced regular chest pain, and 37.7% of them did not have indigestion. In 35–54 years old participants, 38.2% of the participants did not experience heartburn, 29.3% of them usually had stomach acid coming up, and 44.7% never experienced regular chest pain, and 43.9% of them did not have indigestion. Participants older than 54 years old 16.7% of them did not experience heartburn, 33.3% did not experience stomach acid coming up, 26.7% of them never experienced regular chest pain, and 43.3% of them did not have indigestion problems. (Table 3)

Table 3
Severity of gastroesophageal symptoms and its risk factors according to age groups

Age group	Symptoms	Category	N	(%)	Sig. value
18–34 years	Heartburn	Usually	111	44.9	.026
		Sometimes	77	31.2	
		Never	59	23.9	
	Stomach acid coming up	Usually	85	34.4	.078
		Sometimes	95	38.5	
		Never	67	27.1	
	Chest pain	Usually	70	28.3	.040
		Sometimes	57	48.6	
		Never	120	23.1	
	Indigestion	Usually	97	39.3	.666
		Sometimes	57	23.1	
		Never	93	37.6	
	Presence of symptoms	Complete	89	36.1	N/A
		Partial	150	60.7	
		None	8	3.2	
35–54 years	Heartburn	Usually	46	37.4	.026
		Sometimes	30	24.4	
		Never	47	38.2	
	Stomach acid coming up	Usually	36	29.3	.078
		Sometimes	40	32.5	
		Never	47	38.2	
	Chest pain	Usually	48	39.0	.040
		Sometimes	20	44.7	
		Never	55	16.3	
	Indigestion	Usually	39	31.7	.666
		Sometimes	30	24.4	
		Never	54	43.9	
	Presence of symptoms	Complete	45	36.6	N/A
		Partial	77	62.6	
		None	1	0.8	

Age group	Symptoms	Category	N	(%)	Sig. value
> 54 years	Heartburn	Usually	13	43.3	.026
		Sometimes	12	40.0	
		Never	5	16.7	
	Stomach acid coming up	Usually	5	16.7	.078
		Sometimes	15	50.0	
		Never	10	33.3	
	Chest pain	Usually	12	40.0	.040
		Sometimes	10	33.3	
		Never	8	26.7	
	Indigestion	Usually	11	36.7	.666
		Sometimes	6	20.0	
		Never	13	43.3	
	Presence of symptoms	Complete	7	23.3	N/A
		Partial	20	66.7	
		None	3	10.0	
Total			400	100.0	

Participants who were underweight, 47.5% of them usually had heartburn, 25.0% of them usually experienced stomach acid coming up, 42.5% of them usually had chest pain, and 37.5% of them usually had indigestion problems. Participants who were normal or healthy weight, 43.9% of them usually had heartburn, 32.5% of them usually experienced stomach acid coming up, 28.7% of them usually had chest pain, and 41.4% of them usually had indigestion problems. Participants who were overweight, 34.1% of them usually had heartburn, 35.4% of them usually experienced stomach acid coming up, 37.8% of them usually had chest pain, and 34.1% of them usually had indigestion problems. 46.3% of the obese participants in this study usually had heartburn, 24.4% of them usually experienced stomach acid coming up, 34.1% of them usually had chest pain, and 14.6% of them usually had indigestion problems. (Table 4)

Table 4
Severity of gastroesophageal symptoms and its risk factors according to body mass index (BMI)

BMI	Symptoms	Category	N	(%)	Sig. value
Underweight	Heartburn	Usually	19	47.5	.346
		Sometimes	14	35.0	
		Never	7	17.5	
	Stomach acid coming up	Usually	10	25.0	.493
		Sometimes	19	47.5	
		Never	11	27.5	
	Chest pain	Usually	17	42.5	.196
		Sometimes	5	12.5	
		Never	18	45.0	
	Indigestion	Usually	15	37.5	.029
		Sometimes	9	22.5	
		Never	16	40.0	
	Presence of symptoms	Complete	14	35.0	N/A
		Partial	25	62.5	
		None	1	2.5	
Normal	Heartburn	Usually	104	43.9	.346
		Sometimes	71	30.0	
		Never	62	26.1	
	Stomach acid coming up	Usually	77	32.5	.493
		Sometimes	91	38.4	
		Never	69	29.1	
	Chest pain	Usually	68	28.7	.196
		Sometimes	53	48.9	
		Never	116	22.4	
	Indigestion	Usually	98	41.3	.029
		Sometimes	57	24.1	
		Never	82	34.6	
	Presence of symptoms	Complete	81	34.2	N/A
		Partial	146	61.6	
		None	10	4.2	

BMI	Symptoms	Category	N	(%)	Sig. value
Overweight	Heartburn	Usually	28	34.1	.346
		Sometimes	25	30.5	
		Never	29	35.4	
	Stomach acid coming up	Usually	29	35.4	.493
		Sometimes	25	30.5	
		Never	28	34.1	
	Chest pain	Usually	31	37.8	.196
		Sometimes	16	19.5	
		Never	35	42.7	
	Indigestion	Usually	28	34.2	.029
		Sometimes	17	20.7	
		Never	37	45.1	
	Presence of symptoms	Complete	33	40.2	N/A
		Partial	48	58.6	
		None	1	1.2	
Obese	Heartburn	Usually	19	46.3	.346
		Sometimes	9	22.0	
		Never	13	31.7	
	Stomach acid coming up	Usually	10	24.4	.493
		Sometimes	15	36.6	
		Never	16	39.0	
	Chest pain	Usually	14	34.2	.196
		Sometimes	13	31.7	
		Never	14	34.1	
	Indigestion	Usually	6	14.6	.029
		Sometimes	10	24.4	
		Never	25	61.0	
	Presence of symptoms	Complete	13	31.7	N/A
		Partial	28	68.3	
		None	0	.0	
Total			400	100.0	

Discussion

To the best of our knowledge, this is the first study on the prevalence of gastroesophageal reflux disease symptoms in Herat city of Afghanistan. The four major symptoms of the disease were evaluated in this study. According to the current study, 35.2% of the participants had all of the four major symptoms of GERD, while 61.8% of the participants had at least one to three of the four major symptoms. We have found that 42.5% of the participants usually had heartburn, 31.5% of the participants felt the acid taste in their mouth, 32.5% of the participants had chest pain, and 36.8% of the participants had indigestion problems. In a cross-sectional study among the Japanese population, the presence of GERD symptoms was found to be 35.5%. (15) In another study among the general population of Turkey, 50.3% of the participants had a history of GERD symptoms (16), while the incidence of GERD in North America has been estimated from 18.1–27.8% (17). In another study among the adult population of China, the prevalence of symptoms was found to be almost 19.9% (18). The prevalence of GERD can vary depending on lifestyle and food diet (19). Drinks mainly used by Afghan people like tea can alleviate heartburn (20–21). However, rice can fight heartburn and acid level, which is also one of the commonly consumed foods in Afghanistan (22).

The association of age and heartburn and chest pain of GERD symptoms in this study was found to be significant. As our data shows, the prevalence of heartburn and chest pain GERD symptoms increases by increasing the age of the participants in two age categories (18–34 years old and 35–54 years old age groups). In the 18–34 years old age group, 36.1% of the category's participants had all the four major symptoms of GERD, while it was found to be 36.6% and 23.3% for 35–54 years old and > 54 years old age groups respectively. However, different studies show different results on the significance of association between age and increase in GERD symptoms.

A few studies have found no significant association of age and prevalence of GERD symptoms (23), Also a study in Norway about the association of stressful psychological factors and prevalence of GERD symptoms, the age has no significant association with it. (24), However, a study by Aaron P et al. has shown the association of age of onset of GERD symptoms and development of Barrett's esophagus (BE) but has not explained the direct association of age and GERD symptoms (25). Another article by Nacon et al. about lifestyle association with GERD has shown the association of age and moderate/severe GERD symptoms (26). Few studies have shown that the prevalence of GERD increases with age (27). According to a study conducted in Japan among the 6,010 population, the authors found a significant increase in GERD prevalence in the people aged > 80, but there is no significant increase in the GERD among other age groups (28).

The association between the prevalence of indigestion GERD symptoms and BMI was found to be significant. As shown in Table 4. In participants with underweight BMI scores, the prevalence of GERD symptoms was 35.0%, while it was found to be 34.2%, 40.2%, and 31.7% for participants with normal and healthy weight, overweight, and obese BMI scores, respectively.

In other studies, the association between the frequency of GERD symptoms with BMI has been shown. A review of epidemiological evidence of GERD compared the results of 9 studies. Out of which, 3 studies showed no significant relationship between BMI and GERD symptoms (29). A study by Nilsson et al. found that weight gains greater than 3.5 BMI units were associated with a 3-fold increase in the risk of developing reflux symptoms. Also, a large cohort study about the frequency and duration of GERD symptoms conducted on 10,545 female nurses reported a dose-response increase in the risk of GERD even in the normal range of BMI. It showed that even in women with BMI in the normal range, a weight gain leading to an increase in 3.5 BMI units led to increased frequency of GERD symptoms compared to women with no weight changes (30).

Some studies show a significant relationship between high BMI and GERD. It shows that individuals with high BMI have a high prevalence of mechanically defective LES and high exposure of the esophagus to acid, both contributing to symptoms of GERD (31–32).

Conclusion

The result of this study shows that the prevalence of symptoms-defined GERD among the general population of Herat province of Afghanistan is higher than in many countries in the world. The four major symptoms of GERD we have considered in the study are more prevalent than in other countries. A significant association was found between heartburn and chest pain with the age groups. Also, a significant association was found between the indigestion symptom of GERD and the BMI of the participants. The food diet and other risk factors discussed in this study are the major resonators of the symptoms among people. The prevalence of symptoms-defined GERD varies widely across the country as different cultures, and food diets are present in Afghanistan.

Declarations

Contributions

All authors had the same role in the various stages of preparing this article.

Ethical consideration

Permission was secured from AMSA Medical Research Center Ethical Committee through a formal letter. All the participants were briefed on the relevance and objectives of the study.

Conflicts of interest/ Competing interest

The authors declare no conflict of interest.

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