

# Prevalence and precipitating factors of gastroesophageal reflux disease in a young population of Tabriz, Northwest of Iran

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## ABSTRACT

**Objective:** To estimate the prevalence and clinical spectrum of gastroesophageal reflux disease (GERD) in a young population and evaluate the risk factors.

**Methods:** This cross-sectional study using a reliable and valid questionnaire was performed during June and July 2005, on randomized selection of 620 students from Azad University of Tabriz. Gastroesophageal reflux disease was defined as at least weekly heartburn and/or acid regurgitation.

**Results:** Mean age ( $\pm$  SD) of the responders was 22.48  $\pm$  1.98 years. The prevalence of heartburn and/or acid regurgitation experienced at least weekly was 6.3% and monthly was 13%. The severity of symptoms was mainly of a mild to moderate degree. There was no difference in prevalence of any GERD symptom between 2 genders and

it was not associated with age of the study population. A frequent symptom of GERD was reported more among subjects with atypical symptoms. There was no relation between marriage status and prevalence of GERD. On the other hand, GERD was less common among subjects with no family history of upper gastrointestinal disease and students in higher rank fields. Increased body mass index (but no recent weight gain or lose) and drinking coffee and tea was associated with higher prevalence of GERD symptoms.

**Conclusion:** This study as the first study using a valid questionnaire reveals a high prevalence of frequent GERD symptoms in a young population of Tabriz. Atypical symptoms should be considered in this area.

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Gastroesophageal reflux disease (GERD) as one of the most common upper gastrointestinal problems has been a matter of interest in the last few years. This importance is consequence of its complications which are increasing in frequency in several parts of the world. The wide spectrum of gastroesophageal reflux symptoms, ranging from typical to extraesophageal manifestations and accompanied by self medication, may provide difficulties in the diagnosis and identifying the complications faced by patients with

GERD which greatly affects health economics and patient health-related quality of life.<sup>1</sup> Americans may spend \$5 billion annually on anti reflux medicines, while the major recognized risk factors for esophageal carcinoma with an increasing frequency in the USA and western countries in past few decades are GERD and Barrett's oesophagus.<sup>2</sup> Literature suggest a lower prevalence of GERD in Asia than in the west. In the USA 20% of the population experience the cardinal symptoms at least once a week . These extents has

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been reported to decrease to 4.8% and 2.5% in China.<sup>3</sup> We believe that its incidence has increased in the last few years, which can be ascribed to a true increase in the prevalence and/or an intensified awareness. There is a notable lack of epidemiological data describing GERD in the Middle East and Iran. The aim of this study was to estimate the prevalence and clinical spectrum of GERD in a young population; using a valid questionnaire in university students of Tabriz, northwest Iran and evaluate the risk factors.

**Methods.** Tabriz Azad University of Medical Sciences is one of the main universities located in east Azerbaijan, northwest Iran. This university comprises approximately 1200 students. A cross-sectional study was performed on systematized random selection of 620 individuals, during June and July 2005, based on the year of entrance and departments. The aim of the study was explained for randomly selected classes by educated team of interviewers and questionnaire was self completed for a maximum of 30 minutes. Non-responders were excluded from analysis. We used the modified Mayo clinic questionnaire,<sup>4</sup> reliable and valid for Farsi language. The original questionnaire consisted of 72 questions. Additionally, we asked each subject if they are a permanent resident in Tabriz and whether uses homemade food or the food served by the university. All questionnaires were reviewed by the same trained general physician to clarify unreliable answers. Gastroesophageal reflux disease symptoms were defined as at least weekly heartburn and/or acid regurgitation.<sup>5</sup> Percentages were used for categorical data whereas continuous numerical data were expressed as mean  $\pm$  standard deviation. The results were given 95% confidence intervals. Univariate analysis was performed using

the independent samples t-test and Pearson chi-square test whenever appropriate. P-value  $<0.05$  indicated statistical significance. Statistical interpretation of data was performed using SPSS software for windows version 13.

**Results.** Response rate was 95%. Twenty-five questionnaires from the total of 586 considered as not reliable according to the impaired internal validity. The age of the responders ranged from 19 to 52 with a mean age ( $\pm$  SD) of  $22.48 \pm 1.98$  years. The prevalence of heartburn and/or acid regurgitation experienced at least weekly and monthly within the past one year was 6.3% and 13%. The prevalence of heartburn and/or acid regurgitation experienced by the subjects within the past year and for the smaller subset are shown in **Table 1**. They were not related to age and gender, except the acid regurgitation for at least monthly episodes, which was reported significantly higher in women. The severity of symptoms was mainly of a mild to moderate degree. Only 2% of subjects reported severe typical symptoms. The severity of the symptoms was not significantly different between 2 genders. The onset of the typical symptoms in subjects with recurrent GERD was less than one year in 30%, between 1-5 years in 30% and the rest had experienced their symptoms for more than 5 years. The duration of typical symptoms of GERD reported by subjects was not related to the severity of them. Almost a similar pattern was seen among subjects with any GERD symptoms. Interestingly, 31.9% of the subjects reported at least one of the atypical symptoms such as globus sensation, hoarseness, chest pain and asthma. Besides, frequent symptoms of GERD were reported more among subjects with atypical symptoms. Characteristics of subjects with

**Table 1** - The prevalence of typical gastrointestinal reflux symptoms by frequency of symptoms and gender.

Symptoms by frequency	Male %	Female %	Total %
<b>Heart burn</b>			
At least monthly	4.6	5.3	<b>5.1</b>
At least weekly	2.6	2.8	<b>2.7</b>
<b>Acid regurgitation</b>			
At least monthly	10.3	14.6	<b>13.0</b>
At least weekly	3.1	8.1	<b>6.3</b>
<b>Heart burn or Acid regurgitation</b>			
At least monthly	10.3	14.6	<b>13.0</b>
At least weekly	4.6	7.3	<b>6.3</b>

**Table 2** - Characteristics of subjects with or without gastroesophageal reflux (GERD) symptoms.

Characteristics	GERD	No GERD	P value
Male gender (%)	27.8	36.5	NS
Age	$23.4 \pm 4.2$	$23.4 \pm 1.9$	NS
Smoking (%)	5.6	4.0	NS
Drinking tea (mean cup daily) (%)	4.8	2.5	$<0.0005$
Drinking coffee (%)	45.3	23.1	0.001
Atypical symptoms (%)	44.3	30.4	0.020
Self medication (%)	50.0	9.4	0.007
Positive family history (%)	52.3	13.1	0.000
Impaired quality of life (%)	5.6	1.2	0.029
Seek medical advice (%)	51.9	2.9	$<0.0005$

or without gastroesophageal reflux symptoms are shown in **Table 2**. There was no relationship between marriage status and prevalence of GERD symptoms. On the other hand, GERD was less common among students in higher rank fields (adjusted to age and gender). The mean age of subjects with any GERD symptoms seeking for health care was significantly more than subjects self medicating ( $p=0.044$ ). Frequent GERD was associated with higher body mass index (odds ratio: 2.8 [95% confidence interval: 1.7- 4.5]). Recent weight gain or lose did not seem to influence the GERD symptoms in the study population. We noticed a significant higher prevalence of any GERD symptoms among subjects drinking more than 2 cups of tea each day ( $p<0.0005$ ). Interestingly, 30% of our population had a history of using antacid or proton pump inhibitors (PPIs), which was more among subjects with frequent GERD symptoms. Almost 25% of subjects with recurrent symptoms did not feel suffering from the symptoms, while 23% reported acid regurgitation as the dominant symptom, followed by heart burn, chest pain and epigastric pain. We did not find significant difference in frequent GERD symptoms between residents of Tabriz and students from other cities ( $p= NS$ ). Homemade, fast foods or meals served in the university don't seem to influence the prevalence on frequent GERD symptoms ( $p=NS$ ).

**Discussion.** The goal of this study was to determine the prevalence of gastroesophageal reflux symptoms in a young population from Iran, while different studies suggest the existence of genuine geographical and ethnic differences.<sup>6</sup> This study as the first study using a valid questionnaire in this region reveals a high prevalence of frequent GERD symptoms in a young population. Gastroesophageal reflux disease is a spectrum of disease with classic symptoms of heart burn 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. Despite the fact that GERD is believed to be uncommon in the Orient, very little is known about the current state and aspects of the disease, specially in the middle east. The Asia-Pacific consensus report on the management of the GERD recognized that GERD is less common and milder in endoscopic survey in Asia than in the West and it does not support the idea of increasing frequency of the disease.<sup>7</sup> Yet studies regarding the high prevalence of GERD are mainly from westernized countries and some are limited by the absence of a validated questionnaire. The first study from Asia (Singapore)

on prevalence of GERD was performed in 1998 by a valid questionnaire and hypothesized a very low prevalence (1.6%). However, this was followed by a study on the same population with the same questionnaire in the year 2000 which revealed a significantly higher prevalence (9.9%).<sup>8</sup> However, in a population based study from Korea the prevalence of weekly GERD was 3.5%.<sup>9</sup> In another study, from Iran on health blood donors, the prevalence of GERD was reported 14%.<sup>10</sup> There is only one study in our region by a face to face interview, which GERD was defined as a proof of recurrent heart burn and reported a low prevalence (2.7%) of GERD.<sup>11</sup> A recent study on GERD in a low-income region in Turkey reported weekly heartburn and/or acid regurgitation in 20% of study population, which was increased significantly with age.<sup>12</sup> In another study from an urban population, Pakistan reports an overall frequency of 24% for GERD symptoms with a high rate (32%) of self-medications.<sup>13</sup> However, the prevalence of GERD in selected groups such as asthmatic patients is even higher, 44% of patients with asthma had a pathological GERD in Saudi Arabia.<sup>14</sup> Clinic-based studies may overemphasize severity of the disease but underestimate the prevalence, because those patients who consult a physician for GERD present only the tip of the disease iceberg. In a population based, endoscopic screening program in Ardabil Province of Iran, with racial and cultural similarities to our region, 36% of the 504 individual screened had endoscopical esophagitis.<sup>15</sup> Increasing BMI was independently associated with GERD symptoms. This is compatible with previous studies.<sup>2,16</sup> Decreased physical activity, using fast foods and low fiber intake which are closely related to an increase in BMI may be responsible for GERD symptoms. Official's national data revealed approximately 40% of Iranian consume more food than they need and the average Iranian consume 40% more carbohydrate and 30% more fat than needed.<sup>10</sup> There is evidence that severity of symptoms and less adequate close social support were significantly associated with health care seeking.<sup>5</sup> Our finding support these results: seeking medical advice was associated with impaired quality of life even among our young study population. This may strongly influence the complications faced by patients. Our results were limited to the study population, which comprises of a young population but we believe that this is reliable for further studies considering the characteristics of our sample. However, studies such as this may be prone to response bias, which was minimized by a high response rate in our study. This study adds to the growing body of evidence implicating an increase in the prevalence of GERD in

Asia and middle east over the past decade (with acid regurgitation as the dominant symptom); changes in eating habits, increasing dietary fat and body weight and increasing stress levels may all be contributed. Gastroesophageal reflux disease is a chronic condition which can significantly impair quality of life.

We conclude that the prevalence of GERD seem to be similar in Western and non-Western countries. Atypical symptoms should be considered in this area. We hope that our results can provide direction for future educational efforts, by expressing the spectrum of typical and atypical symptoms. Increased recognition of the true impact of GERD, particularly among general physicians, should help to increase the timely use of effective reflux-based management strategies for these apparently disparate conditions.

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