An Epidemiological Study of Gastroesophageal Reflux Disease and Related Risk Factors in Urban Population of Mashhad, Iran

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Background: Gastroesophageal Reflux Disease (GERD) is a chronic and common disease, which is characterized by heartburn and regurgitation. In the last couple of decades, GERD has received much attention and studies have shown an increase in its prevalence. Although there have been a few studies on the prevalence of GERD in Iran, no study has yet been done in the northeastern part of the country. The aim of our study was to evaluate the prevalence of GERD and its risk factors in a population from Mashhad.

Patients and Methods: This was a cross sectional descriptive study conducted in 2010. In total, 2500 participants were selected based on cluster sampling. Modified and validated Mayo Clinic questionnaire for GERD was used for data collection. Overall, 1685 questionnaires were retrieved. Fifty-one participants were excluded because of pregnancies, history of abdominal surgery and being less than 18 years old. We analyzed data using the SPSS software version 16. Prevalence of GERD and significant risk factors (P value < 0.05) were determined.

Results: In total, 420 participants (25.7%) had GERD symptoms. Risk factors with significant effects consisted of smoking, consumption of non-steroidal anti-inflammatory drugs (NASIDs), overeating, chronic diseases, tea and coffee consumption and GERD in spouse.

Conclusions: The prevalence of GERD among people living in Mashhad was above the average prevalence in other cities of Iran. However, risk factors seemed to be similar to those reported by other studies.

Keywords: Gastroesophageal Reflux; Risk Factors; Gastroesophageal Reflux Disease; Iran

1. Background

Gastroesophageal reflux disease (GERD) is a common chronic and recurrent gastrointestinal problem worldwide, especially in the west (1, 2). It is defined by the abnormal reflux of gastroduodenal content into the esophagus, occurring on a daily, weekly or yearly basis, which may lead to other complications including esophagitis, esophageal ulcer, upper gastrointestinal bleeding and Barrett’s esophagus (3-5). In all previous studies the number of occurrences, time and severity are considered. However, one of the problems with the epidemiological study of reflux disease has always been the lack of a comprehensive and standard definition for the disease. Consequently, the actual prevalence and incidence of reflux disease are unknown due to the lack of such definition and insufficient population based studies (6, 7). In several epidemiological studies, the weekly prevalence of reflux disease in developed countries has been reported to range from 10% to 48%. About 44% of Americans experience the symptoms of reflux at least once a month, with 20% and 7% having weekly and daily reflux, respectively (7). Retrograde endoscopic-

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social aspects of life are impaired. There is a significant correlation between a depressed sense of well-being and the severity of GERD (14, 15). In Iran, significantly different prevalence rates for GERD have been reported by different studies, reflecting the varying methodologies and definitions implemented (16-20). Body mass index (BMI) is a risk factor for GERD, yet weight loss does not improve the disease. The effect of gender is controversial; i.e., several studies have shown a high prevalence in men, while others have reported no gender differences. Other potential risk factors include asthma, a positive history of GERD in first-degree relatives and spouse, lower levels of education and socioeconomic status, coffee, tea and alcohol consumption, smoking, and consumption of non-steroidal anti-inflammatory drugs (1, 17, 21).

2. Objectives

The aim of this study was to assess the epidemiology of GERD and its risk factors according to a population based study in Mashhad, which is the second largest city of Iran after the capital city.

3. Patients and Methods

This study was a cross sectional analysis conducted during 2010. The sample size was calculated as 2500. Cluster sampling was performed in 50 city locations based on electrical code area and 50 participants were included for each location. In total, 1685 questionnaires were retrieved. Fifty-one out of 1685 had less than 18 years of age, were pregnant, had a history of abdominal surgery, had a coincidental disease including malignancies or consumed drugs which might influence the outcome of the study and thus were excluded.

The original questionnaire was obtained from the Mayo Clinic with permission; this questionnaire was distributed as a pilot study in a limited population and its validity was checked. The questionnaire covered demographic characteristics, major and minor symptoms of GERD plus their severity. The study was initiated by dividing the city of Mashhad geographically into fifty areas. Subsequently, fifty questionnaires were distributed randomly in each of the areas. The Research Ethics Committee of Mashhad University of Medical Sciences approved the study and definitions implemented (16-20). Data collection was done by distributing the questionnaires around the city and collecting them during the following days. Trained medical students were recruited to handle possible confusion regarding the questions. People with at least one week of reflux symptoms over the past year were included in the reflux group. The SPSS software version 16 was used for statistical analysis. A P value of 0.05 or less was considered statistically significant. All reported P values were two sided using the chi-square test.

4. Results

Approximately 60% of the questionnaires were collect-
Figure 1. Prevalence of Reflux in Mashhad

Figure 2. Frequency of Symptoms in the Gastro-esophageal Reflux Disease Group

Figure 3. Response Rate to Gastro-esophageal Reflux Disease Treatment Among Participants With Gastro-esophageal Reflux Disease

respectively. The most common herbal medicine used was cumin (Caraway), followed by licorice and mint. Among those who had resorted to herbal medicines, 29.2% became symptom free, with 5.4% and 13.4% reporting relative and no resolution of symptoms, respectively. Furthermore, there was a significant relationship between the severity of symptoms and the rate of seeking medical consultation.

5. Discussion

Despite the fact that GERD is believed to be uncommon in the orient, it is prevalent and increasing both in Western countries and Iran. This disease has major effects on health, economics, and patients’ health-related quality of life. Reports on the prevalence and risk factors of GERD are very inconsistent; this may be due to a lack of a uniform definition for the disease, nonstandard diagnostic methods, differently prepared questionnaires, patients’ varying habits and life styles and geographical diversity (24, 25). Given the fact that reports on the prevalence of reflux from various parts of the country are quite different, we defined a population-based study in Eastern Iran to determine the prevalence of GERD and its risk factors.

In this study, the main symptoms of GERD (i.e. heartburn and acid regurgitation), with a frequency of at least once a week, were considered as the diagnostic criteria for reflux. From the total of 1637 subjects, 420 cases met the criteria, with a calculated prevalence of 25.7%. Compared to other studies around the country, the prevalence of GERD was high in Eastern Iran. Different studies from Iran have yielded greatly varying prevalence rates, ranging between 2.7% and 44% (10, 26). Studies conduct-
ed in Tehran, the capital of Iran, showed a prevalence rate of 18.2%, Tabriz 26.8%, and Isfahan 25%. The duration of symptoms was included in some studies, ranging from once a week for six months to once a week for three months (5, 10, 27). However, the duration of symptoms was one year for the present study. Regarding the classification strategy of this study, the participants were divided into four groups, including mild, moderate, severe, and very severe, based on their symptom severity. If subjects with mild symptoms were eliminated from the study, the reflux group would consist of 374 subjects with a prevalence rate of 22.8%. However, if people with a symptom frequency of two or more times a week, or once weekly but with moderate or greater severity (severe or very severe) were included in the GERD group, the reflux group would consist of 399 subjects and a prevalence rate of 24.4%.

According to three previous studies conducted in Iran there is no significant correlation between age and reflux (5, 18, 19). This was also confirmed by our study. However, although no correlation can be found in the available literature between age and regurgitation, such a relationship is suggested for heartburn and age (8, 28). In our study regurgitation occurred more frequently than heartburn. Therefore, the lower incidence of heartburn may be the reason for a lack of correlation between reflux and age in the present study. A possible risk factor for GERD according to our findings is being a female since approximately 59.5% of the subjects in the reflux group were women (P < 0.005) (17, 19, 26).

Furthermore, we found a sharp correlation between the level of education and reflux (P <0.005) (17, 19, 29). Supportive studies from Iran and Asia showed similar results, while one study suggested the opposite (30). Regurgitation, the dominant complaint reported in GERD by most studies, was the only complain in 25.7% of the reflux population in our study (5, 19, 31, 32). A significant correlation was reported in our study between over eating and GERD (33). In one study, overeating was reported as a risk factor for GERD. Furthermore, patients consuming aspirin, a nitroglycerin medication, have a higher risk for reflux, and 50% of people with chest pain are affected by GERD (34, 35).

In different studies, the consumption of NSAIDs was shown to have a strong correlation with reflux disease. In our study, however, no statistically significant correlation could be found between these variables. Similarly, a sedentary type of living was shown to poorly correlate with reflux disease (19, 26). Similar to previous literature, cigarette smoking was considered as a risk factor for reflux in our study (16, 19, 26). In contrast, tea consumption (17, 19, 26, 36) in addition to fast food (36) have been introduced as common risk factors for GERD.

Interestingly, those with a history of reflux disease in their spouse proved to be at risk for reflux (19). In this study, a high prevalence rate of gastroesophageal reflux disease was found among people living in more urban areas of Mashhad. The symptoms of reflux for these areas were the same as other regions, although the rate of regurgitation was higher. Finally, there was no significant difference between the severities of symptoms among different regions in Iran. The strong point of this study was the large number of participants, which were chosen from different parts of Mashhad city with different life styles. The study could have given more definite data if the questionnaire had been filled out by an interview. We suggest prospective studies on the treatment course and complications to find out more about risk factors and use them to eliminate or decrease the complications of GERD.

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Authors’ Contributions

Design: Hassan Vossoughinia and Alireza Shariati. Acquisition of data: Alireza Shariati, Mohammadjavad Shariati and Siavash Abedini. Analysis and interpretation of data: Alireza Shariati. Drafting of the manuscript: Masoumeh Salari and Siavash Abedini. Statistical analysis: Elham Mokhtari Amirmajdi. Study supervision: Hassan Saadatnia and Ahmad Khorasvi Khorashad.

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