Prevalence of Gastroesophageal Reflux Disease in Saudi Arabia

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Abstract

Background: Gastroesophageal reflux disease (GERD) is a common chronic gastrointestinal tract disease. The incidence is higher in Asian and Arab countries. In Saudi Arabia, there are few studies that have assessed the prevalence of GERD among some cities' communities. Hence, this study aims to study the prevalence of GERD among the general population of Saudi Arabia.

Methods: A cross-sectional study was designed to determine the prevalence of GERD among the community of Saudi Arabia. The sample was randomly gathered through self-administered validated GERD questionnaire (GerdQ) to diagnose GERD, during the period from November to December 2016. The sociodemographic data was assessed for all participants. The data were analysed using Statistical Package for Social Sciences version 21.0 (SPSS); the t-test was used to assess the association of GERD and sociodemographic data.

Results: The sample was comprised of 2,043 participants. Female and male were 51.8% and 48.2%, respectively. Mean age was 29.6 years with the standard deviation of 10.5 years. The GERD prevalence was 28.7%. It was found statistically significant among divorced/widow (34.9%, P = 0.003). In contrast, there was no association between GERD’s prevalence and gender, age, residence status, education level, occupation, and blood group (P > 0.05).

Conclusions: The prevalence of GERD among Saudi population is higher than that in Western countries and East Asia. It affects divorced/widow, obese and those with a sedentary lifestyle. It is advocated that national programs and educational campaigns for prevention of this disease and its complications should be established.

Keywords: GERD; Reflux; Prevalence; Saudi Arabia

Introduction

A healthy individual typically has a physiological backflow of the gastric contents to the esophagus. When these refluxes cause uncomfortable symptoms such as heartburn and/or acid regurgitation, additional to an injury of the esophageal mucosa for not less than once per week, that is called "gastroesophageal reflux disease (GERD)" [1].

GERD has a large negative impact on the health care systems and patients' health-related quality of life [2]. In addition, the irritation of esophageal mucosa by the acid reflux will be followed by metaplasia (Barrett's esophagus), that are finally result in esophagus adenocarcinoma [3].

The estimated range of GERD prevalence in the Middle East was 8.7-33.1% [4]. Most of the researches done in the Middle East came from Iran which reported a high prevalence of 33% compared to the Western countries of 28% [5].

In Saudi Arabia, based on two studies conducted in the west region and Riyadh using the GerdQ questionnaire with a score of ≥ 8 as the diagnostic criteria of GERD, the prevalence range of GERD was 23.47% - 45.4% [5, 6]. Also, there was one retrospective study reported the prevalence of GERD in the south of Saudi Arabia 15% [7].

Since there are 13 regions in Saudi Arabia and there is no previous study to assess the prevalence of GERD in these regions, this study aimed to determine the prevalence of GERD and assess its relations with sociodemographic data in a random cohort of Saudi Arabia.

Methods

A cross-sectional study was designed to assess the prevalence of GERD and its sociodemographic associations among the communities of Saudi Arabia. The minimum sample size that should be achieved is 385 subjects that represent the Saudi population (20 millions) with a confidence level (CL) of 95% and confidence interval (CI) 5%. The sample of 2,043 individuals (CL: 99%; CI: 2.85%) was collected randomly using a self-administered questionnaire on the website and by trained medical students through interviewing general population, during the period from November 1 to December 22, 2016. The ethics approval was acquired from the Research Ethics Committee at Taif University (Application Number: 38-36-0043).
The questionnaire included two parts: 1) The first part was to collect the sociodemographic data (gender, age, marital status, residence, educational level, occupation, and blood group), 2) the second part was the GerdQ, which is the diagnostic tool for the GERD. GerdQ is composed of six questions, of which four questions are about the positive GERD predictors (heartburn, regurgitation, sleep disturbance due to heartburn and regurgitation and using over the counter (OTC) medications) and two questions about the negative GERD predictors (nausea and epigastric pain).

Data collection

There is no available validated Arabic GerdQ. So that, the questionnaires were translated from English to Arabic and then conducted by trained medical students through interviews with the general population in the malls, hospitals, primary health care centres, universities, and schools. Also, the online questionnaire (website: http://cutt.us/GerdQ) was shared through the social media applications such as WhatsApp, Telegram, Twitter, Facebook, and Instagram. Prior to data collection, all participants were informed about the nature of the study and the voluntary nature of their participation. The electronic consents were obtained from those who agreed to participate in the study through the website. We included all Saudi participants who are over 18 years old and capable to understand the questionnaire.

GerdQ score

The scoring of GerdQ is depending on the frequency of these symptoms during the last week (less than once, once, 2 - 3 times and 4 - 7 times, respectively), where the scores ranging from 0 to 3 for the positive GERD predictors and reversed order for the negative GERD predictors (3 = none). After summation of the scores, the patient who got 8 of score or more was considered as having GERD. The GerdQ sensitivity and specificity for the GERD diagnosis was 65% and 71%, respectively [8].

Statistical analysis

The data were entered using Microsoft Excel 2010, and translated back from Arabic to English. Then, it was analysed using Statistical Package for the Social Sciences SPSS program version 21.0. Data analysis included descriptive statistics as well as the t-test for comparison between groups. A statistical significant is considered when P value < 0.05.

Results

Prevalence of GERD

The prevalence of GERD among the participants was 28.7% (n = 587) (Fig. 1). There were no statistically significant differences between GerdQ results and gender, age group, residence, education, occupation, and blood group (P > 0.05). The statistically significant differences between GerdQ results and the sociodemographic data are documented in Table 1.

Sociodemographic data

The total number of participants in our study was 2,043. Totally, 1,059 (51.8%) of them were female and 984 (48.2%) were male. The average of ages was 29.6 years, and as for the standard deviation 10.5 years. Single participants formed 51.7%, married were 46.2% while divorced or widow were 2.1%. The participants with living in urban areas were 88.9% and 11.1% for rural areas. The educational levels of the participants were university or above 77.7%, high school 19.1%, primary or intermediate school 2.2% and illiteracy 1%. A total of 43% of participants were students, 36.5% employees, 8.6% unemployed, 8.3% housewives, 2.2% retired, 1.5% manual workers.

The blood groups O+, O-, A+, A-, B+, B-, AB+, and AB- were 43.1%, 5.1%, 23.3%, 2%, 10.6%, 1.2%, 4% and 0.4%, respectively. The statistically significant difference between GERD and sociodemographic data are documented in Table 1.

Discussion

GERD is a group of symptoms resulting from reflux of the stomach contents, which causes esophageal or extra esophageal manifestations. There were few studies conducted in the Gulf region to assess the GERD prevalence [6]. Two studies of them were similar to our study and they were conducted in Riyadh and the Western region of Saudi Arabia, in which the prevalence was 45.4% - 23.47%, respectively [5, 6]. Also, another study was done in Qassim region among 200 Saudi school teachers has reported the overall prevalence was 55% [9]. Two retrospective studies conducted in Abha and Jizan (Southern region of Saudi Arabia) using upper gastrointestinal
endoscopy to diagnose GERD and its complications, in which the GERD prevalence was 15% in Abha and the prevalence of Barrett's oesophagus was 0.003% in Jizan [7, 10].

In our study, the prevalence of GERD (28.7%) was lower than a study reported in Riyadh (Saudi Arabia capital city) and higher than a study that was conducted in the Western region of Saudi Arabia [5, 6]. The range of GERD prevalence was 2.5-7.8% in East Asia, 11.6% in Australia, 23% in South America, 8.7-33.1% in the Middle East, 18.1-27.8% in North America and 8.8-25.9% in Europe [4].

As shown in (Table 1), marital status was a significant factor with reflux symptoms. The high prevalence of GERD was obvious among divorced/widow and followed by the single. Most of the previous studies found a significant association between GERD and marital status [11-13]. We surmise the explanation of this high prevalence of GERD among those divorced/widows is due to psychological stresses, which can develop the GERD symptoms [14].

### Table 1. Association of GERD With Sociodemographic Data (n = 2,043)

| Variables               | GERD Negative | GERD Positive | P value |
|-------------------------|---------------|---------------|---------|
|                         | n  | %   | n  | %   |         |
| Gender                  |    |     |    |     |         |
| Male                    | 699 | 71% | 285 | 29% | 0.824   |
| Female                  | 757 | 71.5% | 302 | 28.5% |         |
| Age (mean ± SD)         | 29 ± 9.8 | 30.7 ± 11.4 | 0.504 |
| Marital status          |    |     |    |     |         |
| Divorces/Widow          | 28  | 65.1% | 15  | 34.9% | 0.003*  |
| Single                  | 721 | 68.3% | 335 | 31.7% |         |
| Married                 | 707 | 74.9% | 237 | 25.1% |         |
| Residence               |    |     |    |     |         |
| Rural                   | 159 | 70.4% | 67  | 29.6% | 0.748   |
| Urban                   | 1,297 | 71.4% | 520 | 28.6% |         |
| Education               |    |     |    |     |         |
| Illiteracy              | 11  | 55%  | 9   | 45%  | 0.423   |
| High school             | 276 | 70.6% | 115 | 29.4% |         |
| University and above    | 1,137 | 71.6% | 451 | 28.4% |         |
| Primary/Intermediate school | 32  | 72.7% | 12  | 27.3% |         |
| Occupation              |    |     |    |     |         |
| Manual worker           | 18  | 60%  | 12  | 40%  | 0.190   |
| Student                 | 605 | 68.9% | 273 | 31.1% |         |
| Retired                 | 31  | 70.5% | 13  | 29.5% |         |
| Housewife               | 121 | 71.6% | 48  | 28.4% |         |
| Unemployed              | 128 | 72.7% | 48  | 27.3% |         |
| Employee                | 553 | 74.1% | 193 | 25.9% |         |
| Blood group             |    |     |    |     |         |
| AB-                     | 5   | 62.5% | 3   | 37.5% | 0.516   |
| B-                      | 17  | 68%  | 8   | 32%  |         |
| Don't Know              | 146 | 68.5% | 67  | 31.5% |         |
| O+                      | 618 | 70.2% | 262 | 29.8% |         |
| A+                      | 338 | 71.2% | 137 | 28.8% |         |
| B+                      | 158 | 73.1% | 58  | 26.9% |         |
| O-                      | 78  | 75%  | 26  | 25%  |         |
| AB+                     | 62  | 75.6% | 20  | 24.4% |         |
| A-                      | 34  | 85%  | 6   | 15%  |         |

GERD: gastroesophageal reflux disease; SD: standard deviation. *Statistical significant.
As shown in (Table 1), we did not find a significant association between age and GERD symptoms. Some studies were compatible with our study [15, 16], but other studies have found an association between GERD and age [17, 18]. In some studies, the age was expressed as an arbitrary cut-off [15, 16, 18], while others expressed the age as a continuous variable [17]. This variation in the methods may lead to this difference between studies.

Female gender has been reported as a risk factor with GERD in previous studies [12, 13], but other studies have not revealed a relationship between gender and GERD [19, 20]. This finding is similar to our study. We did not demonstrate any relationship between reflux symptoms and residency for the first time (P > 0.05). A previous study showed that people living in a rural community have a higher risk of GERD [12]. While other studies found that subjects living in an urban community have a higher risk of GERD; this could be due to psychological factors [21-24].

Previous studies have shown that reflux symptoms were less with high educational level [25, 26], while other studies have found that subjects with low educational level were higher in the prevalence of reflux symptoms. This variation may be attributed to some unhealthy lifestyle factors in subjects with low educational level [12, 13, 27]. Our results demonstrated no correlation between educational level and GERD.

There is a previous study from China that showed a significant relationship between the occupation and GERD [28]. In our study, we found no association. This may be due to the increase in the number of working hours in China compared to Saudi Arabia, we need another study that proves or denies this.

In relation to blood group, there was a high frequency of AB- blood group in gastroesophageal reflux patients but there was no a correlation between blood group and GERD. This finding is identical to other studies [9, 29]. Patients with blood group A and diagnosed with GERD have more likely to develop Barrett’s esophagus or even esophageal cancer suggesting a genetic susceptibility, but patient of blood type O has been shown to have an association with high stomach acid production and is much more likely to develop reflux symptoms [30].

Conclusions

The prevalence of GERD in Saudi population is slightly higher than Western countries and much higher than countries of East Asia. It affects divorced/widow, obese and those with sedentary lifestyle. We must establish national programs and educational campaigns to keep prevention of this disease and its complications.

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Conflict of Interest

No conflict of interest.

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