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Gastroesophageal Reflux Disease in Iran

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ABSTRACT

Introduction and Aims

Gastroesophageal reflux disease (GERD) is very common in western countries. GERD is increasing, has profound effects on health economics, disturbs the patient's health-related quality of life, and increases the risk for development of esophageal adenocarcinoma. GERD is considered to be infrequent in developing countries. This study was performed to determine the prevalence of GERD among Iranians.

Materials and Methods

Major GERD symptoms (heartburn and acid regurgitation) were assessed through an interview by trained general practitioners in three different Iranian populations in 2002: Tehran University freshmen (n=3008), healthy blood donors in Tehran (n=3517), and participants in Golestan cohort study on esophageal carcinoma in Gonbad, north-east of Iran (n=1066). Presence of heartburn or acid regurgitation was considered as GERD and their frequencies were calculated during the last 12 months prior to recruitment.

Results

Three episodes per week or more of GERD symptoms were recorded in 2.1% of university freshmen (mean age 19.1±2.1 years), 4.7% of blood donors (mean age 37.3±10.8 years), and 18.4% of the cohort study participants (mean age 51.3 ± 11.7 years). One to two episodes of GERD symptoms a week were reported in 5.1% of the university freshmen, 5.6% of blood donors and 12.7% of the cohort study participants.

Conclusions

GERD symptoms are frequent among Iranians. There was also a trend toward increasing frequency of GERD with increasing age. A GERD symptom is more prevalent in Iran than other Asian countries and is comparable to that of western countries.

Keywords: Gastroesophageal reflux disease, Heartburn, Acid regurgitation, Iran, Prevalence

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INTRODUCTION

Gastroesophageal reflux disease (GERD) has become rather common in western countries over the past couple of decades.(1), It has a profound effect on health economics, disturbs patients' quality of life and increases the risk for development of esophageal adenocarcinoma.(2), GERD usually presents with a burning sensation extending up along the sternum (heartburn), and regurgitation (defined major symptoms), but it may have a broad spectrum of atypical manifestations including chronic cough, asthma, non cardiac chest pain and otolaryngological symptoms.(3)

None of the currently available para-clinical means of workup fulfill the standards to serve as a gold standard for diagnosis of GERD, therefore a carefully obtained history looking for typical and atypical symptoms of GERD is currently considered the best way to make the diagnosis.

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Earlier reports from Asian countries state GERD is not so common in these countries, although more recent reports point to an increasing trend. This study was performed to determine the prevalence of GERD among Iranians, an Asian country in the Middle-East.

MATERIALS AND METHODS

The study protocol was approved by the ethics committee of the Digestive Disease Research Center, Tehran University of Medical Sciences and observed the principles of the ethical standards for human experimentation. The rational for piled up the three subject populations was author's opportunity to do the study among those populations.

A gastroenterologist trained nine general practitioners (GPs) to conduct a systematic interview with participants to seek for major GERD symptoms, heartburn and regurgitation, during the 12 months before the interview. Because the local dialect of Gonbad inhabitants is different from the Farsi language (the official Iranian language), two out of the nine GPs were originally from Gonbad to be able to communicate with the participants from Gonbad. Because a significant percentage of the Gonbad inhabitants are illiterate and we had planned to incorporate data of the three groups, we used a uniform interview for all participatans.

GERD was diagnosed if the subject admitted to having experienced heartburn or regurgitation over the past 12 months. Then the frequency of the symptoms was assessed and recorded. Information about demographic characteristics, regular daily medication especially Aspirin or non steroid anti-inflammatory drug (NSAID) for≥4 weeks at the time of GERD symptoms and cigarette smoking was obtained and Body Mass Index (BMI) was measured for all subjects. Cigarette smoking ≥10 a day for≥6 months defined as smoker. BMI was calculated as weight (kg) divided by height squared (m^2) and categorized according to the classification of the National Heart, Lung and Blood Institute of the USA(4) as follows: under - weight (< 18.5 kg/m2), normal weight (18.5-24.9 kg/m2), overweight (25-29.9 kg/m2), and obese (≥30 kg/m2).

The study population

The study was performed in three different populations in Iran: Tehran University 2002 freshmen, healthy blood donors' referring to Tehran national blood transfusion center, and participants in an ongoing study on upper gastro-intestinal cancers in Golestan in the north-east of Iran.

All freshmen starting at Tehran University in the year 2002 (n=3100) were invited to participate. Of over 250,000 volunteer blood donors registered at Tehran national transfusion center in the year 2002, 3573 were randomly invited for the interview.

Gonbad district, located in the north-east of Iran, has a rather high incidence of esophageal carcinoma. A cohort study is ongoing in the region to investigate for the possible risk factors link to this deadly cancer.(5), Participants (n=1351) of the pilot phase of the cohort study from three villages (Incheborun, Hali-Akhond and Aq-Abad) and the city of Gonbad were invited for interview.

Statistical analysis

Frequency of events symptoms were calculated and the means were compared with the paired t-test using the SPSS program for windows version 11.5 (SPSS incorp. Chicago, IL, USA). Logistic regression used to assess potential risk factors for reflux (sex, BMI, smoking, Aspirin or NSAID medication) by analysis cases (having GERD symptoms at least once a week) and control (subjects who had not GERD symptoms).

P. value less than 0.05 defined a significant difference.

RESULTS

Of the 3100 Tehran University freshmen, 3008 participated in the study (97.0% participation rate).

Mean age of this group was 19.1 ± 2.1 years. Of these 1745 were from Tehran and the rest were from other provinces. Of the 3573 blood donors, 3517 accepted the invitation (98.4% participation rate). Mean age of the blood donors was 37.3 ± 10.8 years. In Gonbad 1,066 of 1351 people accepted to participate (78.9%). Mean age of this group was 51.3 ± 11.7 years.

Table 1 shows the frequency of major GERD symptoms and the gender distribution among the three groups. As is apparent in this table the frequency of one of the two major GERD symptoms occurring at least once a week ranges between 8.8 to 16.3%.

Table 2 shows prevalence of risk factors among cases complain of major GERD symptoms and subjects who had not major symptoms of GERD.

GERD frequency was not different between males and females among the Tehran University students and the healthy blood donors, but it was more common in females in Gonbad participants (P=0.003). Cigarette smoking and Aspirin or NSAID medication were rare among the students and were not associated with GERD development. Cigarette smoking, Aspirin or NSAID medication were risk factors for GERD among the blood donors and Gonbad inhabitants. Obesity had not impact for developing GERD in our study populations (table 2).

Table 1: Relative Frequency of major GERD *symptoms

Symptoms	Students			Blood donors			Gonbad inhabitants		
	Female (n=1785)	Male (n=1223)	Total (n=3008)	Female (n=402)	Male (n=3115)	Total (n=3517)	Female (n=616)	Male (n=450)	Total (n=1066)
Heartburn									
≥3 episodes/week	0.9% n=16	0.7% n=8	0.8% n=24	1.7% n=7	2.0% n=61	1.9% n=68	14.1% n=87	11.1% n=50	12.8% n=137
1-2 episodes/week	4.0% n=71	1.6% n=19	3.0% n=90	2.8% n=11	2.2% n=71	2.3% n=82	10.9% n=67	6.4% n=29	9.0% n=96
1-3 episodes/month	8.6% n=153	5.8% n=71	7.4% n=224	4.0% n=16	4.2% n=130	4.1% n=146	12.8% n=79	8.9% n=40	11.2% n=119
Regurgitation									
≥3 episodes/week	1.8% n=32	0.9% n=11	1.4% n=43	2.8% n=11	3.8% n=117	3.6% n=128	17..8% n=110	11.7% n=53	15.3% n=163
1-2 episodes/week	4.8% n=85	5.5% n=67	5.1% n=152	4.3% n=17	4.7% n=145	4.6% n=162	13.8% n=85	8.7% n=39	11.6% n=124
1-3 episodes/month	11.5% n=205	15.4 % n=188	13.8% n=393	6.8% n=27	6.8% n=210	6.8% n=237	16.2% n=100	9.8% n=44	13..5% n=144
GERD									
≥3 episodes/week	2.5% n=44	1.5% n=18	2.1% n=62	4.0% n=16	4.9% n=152	4.7% n=168	21.1% n=130	14.7% n=66	18.4% n=196
1-2 episodes/week	4.8% n=85	5.5% n=67	5.1% n=152	5.3% n=21	5.7% n=177	5.6% n=198	14.9% n=92	9.8% n=44	12.7% n=136
1-3 episodes/month	16.0% n=287	17.5 % n=214	16.3% n=491	8.3% n=33	8.9% n=277	8.8% n=310	18.2% n=112	10.9% n=49	15.1% n=161

* Presence of heartburn or regurgitation was considered as GERD

Table 2: risk factors for GERD

	Students			Blood donors			Gonbad inhabitants		
	GERD (+) n=214	GERD (-) n=2303	P.value	GERD (+) n=366	GERD (-) n=2841	P.value	GERD (+) n=332	GERD (-) n=573	P.value
Gender									
Female	7.3%	76.7%		9.2%	82.5%		36.0%	45.8%	
Male	6.95%	75.5%	*NS	10.6%	80.5%	NS	24.5%	64.6%	0.03
Smoking									
Smoker	0.14%	0.13%		9.7%	2.3%		11.3%	4.8%	
Non smoker	94.0%	96.0%	NS	67.2%	74.8%	0.02	58.8%	64.6%	0.04
Obesity									
BMI ≥ 30 (kg/m2)	2.6%	2.4%	NS	23.1%	21.6 %	NS	22.8%	24.8%	NS
Aspirin or NSAID use	0	0	NS	18.6%	11.3%	0.04	9.4%	3.7%	0.03

*NS: non significant (p. value > 0.05)

DISCUSSION

GERD is a common disease in the western countries[1]. Many of these patients never seek medical attention and therefore go undiagnosed.[6,7], As the disease affects various aspects of health and consumes considerable resource[8], it is important to know its prevalence in the community in order to be able to plan appropriately to confront it.

Until recently, there was no information about the prevalence of GERD in Asia.

At the beginning a study from Singapore indicated that GERD is uncommon in the East[9]. A further community-based study from China showed that GERD symptoms occurred more than once a month in 5.8 % of the studied population[10]. Endoscopic esophagitis was reported in 15% and 16% of upper GI endoscopies done in two reports from Taiwan and Japan respectively[11,12], although the high frequency of erosive esophagitis was not supported by other endoscopic series from Korea and Hong Kong[13,14].

Our data shows that major GERD symptoms occur monthly or more in 46.2% of the Gonbad inhabitants. This prevalence is comparable to that reported from the United States (29%-44%)[15,16]. GERD prevalence was lower in volunteer blood donors and University freshmen, both groups generally considered to be healthier than the general population. Therefore, major GERD symptom prevalence among them, although considerable, may not be a true representative of the population in general. Instead, it can signify the minimum prevalence in the community. As mentioned before GERD may present with a variety of typical and atypical symptoms, which can only be assessed through detailed history taking using validated questionnaires. Therefore, the prevalence found in our study is the minimum estimated prevalence for our community. Despite this, the prevalence is rather high compared to other reports from the region and Asian countries. In our study regurgitation was more common than heartburn. This may point to symptomatological differences of GERD between our study and western countries[17,18].

In a population based endoscopic surveys on more than 1000 healthy volunteers done recently

in north-west Iran (Ardabil) showed over 34.7% had endoscopic GERD.(19), Our study results from Gonbad inhabitants are comparable to the Ardabil study.

Almost all recent Iranian reports(19-21) as well as reports from other parts of Asia(22) point to increasing prevalence of GERD in Iran and Asia.

The participation rate in our study was high because Gonbad population was well informed about our study regarding health care that we provide for them and voluntary blood donors are highly motivated to participate to any health programme and pick up the fresh man students at the time for providing health identification card for them.

Because students and blood donors are not real representatives of general population, we recommend performing GERD studies in general population in future.

A population based study in china revealed no difference in prevalence between male and female subjects and there was no significant association between age and prevalence of GERD symptoms.(23), In our study there was no difference in prevalence between men and women except Gonbad inhabitants which need multivariate analysis for other risk factors assessment including dietary differences among men and women.

At a study from Norway, more than 3000 individuals who reported severe heartburn or regurgitation during the last 12 months were defined as cases, compared to about 40,000 people without reflux symptoms constituted control group. The authors found tobacco smoking as risk factors for GERD(24) as well as a dose-response association between increasing BMI and reflux symptoms in both sexes.(25)

Cigarette smoking, Aspirin or NSAID medication were rare among the students and we are not able to assess association of smoking and the medication with GERD development in the students. Cigarette smoking, Aspirin or NSAID medication were risk factors for GERD among the blood donors and Gonbad inhabitants which is comparable to other studies.(24-26), Although most studies reveal increasing BMI is independently associated with GERD symptoms(25,26) we did not find obesity to have an impact for developing GERD. This is more comparable to a Swedish study by Lagergren, et al which underwent through a face-to-face interview for reflux symptoms occurrence and BMI measurement. Lagergren, et al revealed GERD occurs independently of BMI and weight reduction may not be justifiable as an antireflux therapy.(27)

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