ITALIAN JOURNAL OF PUBLIC HEALTH

Prevalence and demographic risk factors of gastrointestinal symptoms in Tehran province

Asma Pourhoseingholi, Azadeh Safaee, Mohamad Amin Pourhoseingholi, Bijan Moghimi-Dehkordi, Manijeh Habibi, Mohsen Vahedi, Mohammad Reza Zali

Research Center of Gastroenterology and Liver diseases, Shahid Beheshti University, (M.C), Tehran, Iran
Correspondence to: Azadeh Safaee, 7th Floor of Taleghani Hospital, Research Center of Gastroenterology and Liver diseases, Tehran, Iran. E-mail: AzadeSafaee@yahoo.com

Abstract

Background: Gastrointestinal diseases are maladies that produce multiple symptoms. Suffering from these symptoms attributes people to an illness which they self-treat or seek medical care. The objective of this study is to determine the prevalence of gastrointestinal (GI) symptoms and relation between some demographic factors and GI symptoms in the Province of Tehran.

Methods: This study was a cross-sectional household survey conducted from May 2006 to December 2007 in the Province of Tehran, Iran. The questionnaire included personal and family characteristics such as age, gender, and educational level. In addition to this, interviewers asked about 10 GI symptoms.

Results: A total of 30,334 subjects were included in the study, there were 15,165 men (50%). Among them, 4,400 (14.5%) reported one or more GI symptom. Prevalence of GI symptoms included: heartburn 8.6%, bloating 7.6%, abdominal pain 6.2%, constipation 5.1%, anal pain 1.7%, weight loss 1.4%, diarrhea 1.1%, nausea and vomiting 1%, anal bleeding 0.8% and dysphagia 0.8%.

Conclusions: The prevalence of GI symptoms in the population studied was lower than that reported in other populations. Women had higher prevalence of GI symptoms. With the increase in educational level the chance of have a GI symptom decreased. Singles reported symptoms less than married participants.

Key words: gastrointestinal symptom, population-based study, Tehran

Introduction

Gastrointestinal (GI) diseases are maladies that produce multiple symptoms such as pain, nausea, vomiting, bloating, diarrhea, constipation, or difficult passage of food or faeces [1]. Although, structural diseases can be identified by pathologists and at times cured by medical technologies the non-structural symptoms described as functional gastrointestinal disorders (FGIDs), for which no structural aetiology have been found, remain enigmatic and less amenable to explanation or effective treatment [2]. There are physiological, intrapsychic and socio-cultural factors that amplify the perception of these symptoms so they are experienced as severe, troublesome, and threatening, with a subsequent impact on daily life activities.Those suffering from such symptoms attribute them to an illness and either self-treat or seek medical care [3].

We aimed to estimate the prevalence of GI symptoms including nausea, vomiting, abdominal pain, constipation, diarrhea, abdominal bloating, GI bleeding, and weight loss which may point to a structural GI disease. In addition in this study the relationship between demographic factors and GI symptoms were evaluated.

Methods

This study was a community-based cross-sectional survey conducted from May 2006 to December 2007 in the Province of Tehran, Iran, including five cities (Tehran, Damavand, Firouzkooh, Varamin and Pakdasht) in order to determine the prevalence of gastrointestinal symptoms and disorders and their related factors [4-7]. A total of 30334 persons were randomly selected from these cities according to postal lists which were randomly drawn from the databank registry of the Tehran Central Post Office (in Tehran city) and health dossiers documented at health centers (in other cities).

The questionnaire included personal and family characteristics such as age, gender, marital status and educational level. Marital status was divided into single, widowed and divorced. Also educational level was divided into MS or upper,

upper diploma, lower diploma and primary or lower. In addition to this, interviewers asked about ten GI symptoms including: abdominal pain or distress, constipation, diarrhea, bloating, heartburn, dysphagia, anal pain, anal bleeding, nausea and vomiting and weight loss. Contingency tables, chi-square test and multivariate logistic regression with forward selection method were employed to find the relation between demographic factors and the type of symptoms. The method used for the evaluation of the goodness of the models is Cox & Snell R Square and the statistical significance selected was $P<0.05$. The results of diagnosis with each symptom was proposed as the dependent variable and demographic factors were included in the analysis as independent variables. All analyses were carried out using SPSS version 13.

Results

A total of 30,334 subjects were included in the study. There were 15,165 men (50%) and 15,122 women (49.8%). Gender of 47 (0.2%) persons was unspecified and they were excluded from the analysis. Up to 4,400 (14.5%) of cases reported one or more GI symptom. Prevalence of GI symptoms included: heartburn 8.6%, bloating 7.6%, abdominal pain 6.2%, constipation 5.1%, anal pain 1.7%, weight loss 1.4%, diarrhea 1.1%, nausea vomiting 1%, anal bleeding 0.8%, dysphagia 0.8% (Table 1). According to the results of the chi-square test, prevalence of all of the symptoms except diarrhea and weight loss was different in men and women. The results from multivariate logistic regression, shown in Table 2, indicate that the prevalence of relevant symptoms increased with increasing age. GI symptoms were higher in women than men, with the odds ratios of having symptoms in women 1.243 times higher than men. It was noted that as educational level increased the chance of having GI symptoms decreased. Singles reported symptoms less than those who were married. The value of the goodness of model for all models was up to 0.3. The total prevalence of dysphagia was less than 0.8 %, due to the low number of patients diagnosed with this symptom the software did not support the database to fit the logistic model and the last but not the least. From the cases that reported at least one or more GI symptom, 90 (0.29%) cases reported cholelithiasis, 78 (0.25%) cases reported inflammatory bowel disease, 67 (0.22%) cases reported hepatitis, 37 (0.12%) cases had diagnosed of IBS, 18 (0.06%) cases had duodenal ulcer and 10 (0.032%) cases stated they had a gastric ulcer.

Discussion

The prevalence rates of GI symptoms in our population were 14.5%. Khoshbaten et al in a similar study conducted in north western Iran reported a prevalence of 14.3% [8]. In our study we didn't include a time limitation for having a GI symptom and this was a limitation in our study, but Khoshbaten et al reported the above prevalence rates for symptoms experience in the previous two weeks. In spite of this difference, prevalence rates in this study were almost the same as Khoshbaten's report. Previous studies from Asian countries showed higher prevalence of some GI symptoms [9, 10] and the prevalence of GI complaints have been reported to be 15% to 54% in some western countries [9-13]. These estimates are much higher than in our population. The low prevalence in this study reported maybe due to diet and cultural behaviors of the Iranian people in comparison with other countries [8]. For example in western countries, the diet is

Table 1. Frequency of gastrointestinal symptom during the last one month in the study population.

Symptoms	Men (n=15165)		Women (n=15122)		P-value
	n (%)	CI (95%)*	n (%)	CI (95%)*	
Abdominal pain	777 (5.1%)	(4.77-5.47)	1,101 (7.3%)	(6.87-7.69)	<0.0001
Constipation	591 (3.9%)	(3.59-4.21)	938 (6.2%)	(5.82-6.59)	<0.0001
Diarrhea	162 (1.07%)	(0.90-1.23)	182 (1.2%)	(1.03-1.38)	0.267
Bloating	914 (6.03%)	(5.65-6.41)	1,399 (9.25%)	(8.79-9.71)	<0.0001
Heartburn	1,148 (7.57%)	(7.15-7.99)	1,456 (9.63%)	(9.16-10.10)	<0.0001
Anal pain	173 (1.14%)	(0.97-1.31)	336 (2.2%)	(1.99-2.46)	<0.0001
Anal bleeding	92 (0.6%)	(0.48-0.73)	144 (0.95%)	(0.80-1.11)	0.001
Nausea and vomiting	118 (0.78%)	(0.64-0.92)	198 (1.3%)	(1.13-1.49)	<0.0001
Weight loss	200 (1.32%)	(1.14-1.50)	228 (1.51%)	(1.31-1.70)	0.164
Dysphagia	89 (0.6%)	(0.47-0.71)	139 (0.92%)	(0.77-1.07)	0.001
Symptom**	1,871 (12.34%)	(11.81-12.86)	2523(16.68%)	(16.09-17.28)	<0.0001

* Confidence Interval

**having at least one symptom from ten symptoms

Table 2. Relation between demographic factor and GI symptom using multivariate logistic regression.

Variables	Abdominal pain		Constipation		Diarrhea		Bloating		Heart burn		Anal pain		Anal bleeding		Nausea vomiting		Weight loss		Symptom	
	OR§	P valu	OR§	P value	OR§	P valu	OR§	P value	OR§	P valu	OR§	P valu	OR§	P valu	OR§	P valu	OR§	P value	OR§	P value
Age	1.018	<0.001	1.026	<0.0001	1.015	<0.001	1.028	<0.0001	1.025	<0.001	1.023	<0.001	1.015	0.001	1.025	<0.001	1.013	<0.0001	1.023	<0.0001
Gender																				
Female	1.248	<0.001	1.412	<0.0001			1.440	<0.0001	1.130	0.008	1.645	<0.001	1.370	0.027	1.528	<0.001			1.243	<0.0001
Education level		0.001		0.003				0.003		0.003		<0.001						0.016		0.006
Upper diploma	1.438	0.085	1.598	0.039			1.589	0.012	1.291	0.164	1.797	0.146					2.232	0.183	1.686	<0.0001
Diploma	1.280	0.229	1.558	0.045			1.336	0.104	1.386	0.064	1.812	0.130					2.974	0.064	1.627	0.001
Lower diploma	1.579	0.024	1.428	0.106			1.305	0.131	1.506	0.018	1.600	0.228					3.574	0.029	1.669	<0.0001
Primary or lower	1.640	0.015	1.201	0.407			1.182	0.364	1.617	0.006	0.918	0.829					3.551	0.030	1.682	<0.0001
Marital status		<0.001		<0.0001		0.009		<0.0001		<0.001		<0.001		0.001				0.002		<0.0001
Married																				
Single	0.502	<0.001	0.597	<0.0001	0.623	0.006	0.381	<0.0001	0.286	<0.001	0.329	<0.001	0.397	<0.001			0.593	0.001	0.457	<0.0001
Widow	1.291	0.009	1.255	0.033	1.562	0.031	1.063	0.500	1.061	0.495	1.279	0.173	1.166	0.567			1.210	0.341	1.125	0.114
Divorce	1.369	0.255	1.855	0.019	0.511	0.504	1.363	0.206	1.067	0.803	1.876	0.111	0.657	0.676			2.110	0.104	1.322.	0.160
Abdominal surgery	1.709	<0.001	1.849	<0.0001	1.510	0.001	1.711	<0.0001	1.638	<0.001	2.253	<0.001	1.462	0.010	2.087	<0.001	1.801	<0.0001	1.723	<0.0001

§ Odds Ratio

The total prevalence of dysphagia was less than 0.8% so due to low number of patients diagnosed with this symptom the software did not support the database to fit the logistic model.

lower in fiber but with higher amounts of fat, coffee and alcohol; which maybe responsible for the higher prevalence of GI complaints in western countries.

Heartburn was the most common symptom in our population, in comparison to a prevalence of 9% to 10% [14, 15]. Bloating was reported in 7.6% of our population, which is higher than what was reported in Khoshbaten's study.

Abdominal pain was the third most common symptom in our population. The prevalence rates of abdominal pain in France, India, Singapore and Australia are reported to be 13.7%, 14.6%, 5.7%, and 44% respectively [14, 16-18].

Constipation was one of the other most frequent symptoms in our results. The prevalence of constipation reported in other regions was 3%-36% [16, 17, 19, 20]. In this study prevalence was evaluated in gender groups and in agreement with other studies, women had higher prevalence of symptoms [8]. For example women were more likely to be constipated than men yet studies show that it occurs about three times more frequently in men [21, 22]. According the result of multivariate logistic regression older people reported these symptoms more. In addition people with a higher level of education had less GI symptom than people with lower educational levels. This is due to the fact that higher educated people care more about their health.

Conclusions

The prevalence of GI symptoms in the studied population of Tehran was lower than that previously reported from other populations. Women had a higher prevalence of GI symptoms. It was also shown that as educational levels increased the chance of have a GI symptom decreased. Finally, singles reported symptoms less than those who were married.

Acknowledgements

We wish to express our gratitude to Research Center for Gastroenterology and Liver Diseases, for kindly funding and supporting this research project and all persons in Health Centers of Firoozkouh city, Damavand city, Varamin city, Pakdasht city and Tehran metropolitan for the process of data gathering.

References

1) Simic O, Strathausen S, Hess W, Ostermeyer J. Incidence and prognosis of abdominal complications after cardiopulmonary bypass. Cardiovasc Surg 1999; 7(4): 419-24.
2) Mayer EA. The challenge of studying the biology of complex, symptom-based GI disordears. Gastroenterology 2000; 133(4): 1113-23.
3) Drossman DA. The functional gastrointestinal disorders and the Rome III process. Gastroenterology 2006; 130(5): 1377-90.
4) Zarghi A, Pourhoseingholi MA, Habibi M, Nejad MR, Ramezankhani A, Zali MR. Prevalence of gastrointestinal symptoms in the population of Tehran, Iran. Trop Med Int Health 2007; 12(supplement); 181-2.
5) Zarghi A, Pourhoseingholi MA, Habibi M, Haghdost AA,, Solhpour A, Moazezi M, et al. Prevalence of gastrointestinal symptoms and the influence of demographic factors. Am J Gastroenterol 2007; 102(supplement): 441.
6) Solhpour A, Pourhoseingholi MA, Soltani F, Zarghi A, Solhpour A, Habibi M, Zali MR Gastro-oesophageal reflux disease and irritable bowel syndrome: a significant association in an Iranian population. Eur J Gastroenterol Hepatol 2008; 20(8): 719-25.
7) Solhpour A, Pourhoseingholi MA, Soltani F, Zarghi A, Habibi M, Ghafarnejad F, Tajik Z, Rostaminejad M, Ramezankhani A, Zali MR. Gastro-esophageal reflux symptoms and body mass index: no relation among the Iranian population. Indian J Gastroenterol 2008; 27(4): 153-5.
8) Khoshbaten M, Hekmatdoost A, Ghasemi H, Entezariasl M. Prevalence of gastrointestinal symptoms and signs in northwestern Tabriz, Iran. Indian J Gastroenterol 2004; 23:168-70.
9) Tougas G, Chen Y, Hwang P, Lio MM, Egleston A. Prevalence and impact of upper gastrointestinal symptom in the Canadian population: finding from the DIGEST study. Am J Gastroenterol 1999; 94: 2845-54.
10) Frexinos J, Denis P, Allemand H, Allouche, S, Los F, Bonnelye G. Descriptive study of digestive functional symptom in the French general population. Gastroenterol Clin Boil 1998; 22:785-91.
11) Sandler RS, Stewart WF, Liberman IN, Ricci JA, Zorich NL. Abdominal pain, bloating, and diarrhea in the United States: prevalence and impact. Dig Dis Sci 2000; 45: 1166-71.
12) Frank L, Kleinman, M, Gnoczy D, Mcquid K, Solan S, Eggleston A, et al. Upper gastrointestinal symptom in north America:prevalence and relationship to healthcare utilization and quality of life. Dig Dis Sci 2000; 45: 809-18.
13) Stanghellini V. Three-month prevalence rates of gastrointestinal symptoms and the influence of demographic factors: results from the Domestic/International Gastroenterology Surveillance Study (DIGEST). Scand J Gastroenterol Suppl 1999; 231: 20-8.
14) Shah SS, Bhatia SJ, Mistry FP. Epidemiology of dyspepsia in the general population in Mumbai. Indian J Gastroenterol 2001; 20:103-6.
15) Khoshbaten M. Gastro-esophageal reflux disease in north-western Tabriz, Iran. Indian J Gastroenterol 2003; 22: 138-9.
16) Bommelar G, Rouch M, Dapoigny M, Pais D, Loisy P, Gualino M, et al. Epidemiology of intestinal functional disorders in healthy population. Gastroenterol Clin Boil 1986; 10: 7-12.
17) Ho KY, Kang JY, Seow A. Prevalence of gastrointestinal symptom in a multiracial Asian population, with particular reference to reflux-type symptoms. Am J Gastroenterol 1998; 93: 1816-22.
18) Huang RC, Palmer LJ, Forbes DA. Prevalence and pattern of childhood abdominal pain in an Australian general practice. J Paediat Child Health 2000; 36: 349-53.

19) Mitchel CM, Drosssman DA. Suvey of the AGA membership relating to patient with functional gastrointestinal disorder. Gastroenterology 1987; 92: 1282-4.
20) DeAraujo Sant'Anna AM, Calcado AC. Constipation in school-aged children at public school in Rio de Janeiro, Brazil. J Gastroenterol 2003; 22: 138-9.
21) Sonnenberg A, Koch TR. Epidemiology of constipation in the United States. Dis Colon Rectum 1989; 32:1–8.
22) Drossman DA, Li Z,Andruzzi E, et al. U.S. householder survey of functional gastrointestinal disorders. Dig Dis Sci 1993; 38:1569–80.