Uninvestigated dyspepsia and its related factors in an Iranian community

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ABSTRACT

الأهداف: لتحديد مدى الانشار والسيطرة على التخمة/سوء الهضم في المجتمع الإيراني.

الطريقة: اجريت هذه الدراسة المقطعية خلال الفترة مابين مايو 2006م وحتى ديسمبر 2007م، بجامعة شهيد بشتي – محافظة طهران – إيران، وشملت 18180 شخص بالغ تم اختيارهم بشكل عشوائي. تم تعبئة استبيانات على مرحلتين، فى المرحلة الأولى، تم تشخيص الاشخاص الذين كانوا مصابين على الأقل بواحد من أعراض الجهاز الهضمي، و فى مرحلة الثانية، تم تعبئة الاوراق التى كانت فيها أسئلة عن هولاء الاشخاص التى تم تنظيمهم على معايير Rome III التخمة/سوء الهضم الفاعل.

النتائج: كانت نسبة وجود التخمة/سوء الهضم 8.5% (10.9% في النساء) و (6.4% في الرجال). اكثر علامة فى المصابين التخمة/سوء الهضم كان الإحساس المزعج بالتخمة بعد تناول الطعام 41.5%، كان انتشار التخمة/سوء الهضم اكبر بين الطبقات ذات المستوى التعليم المنخفض والأرامل. حددة نسبة 41.4% من المصابين كان لديهم تاريخ إصابة بالإكتئاب، و 66.1% يعانون من الضغط النفسي. نسبة شيوع أمراض IBS و GORD فى المصابين التخمة/سوء الهضم كان 8.3% و 64.9%.

خاتمة: بالمقارنة بالمجتمعات الغربية وجدنا أن انتشار التخمة/سوء الهضم في المجتمع الايراني أقل. النساء، المسنين، اصحاب الضعف الجسماني، الأرامل واصحاب المستويات العلمية المتدنية هم اكثر فئات المجتمع عرضة للإصابة بالتخمة/سوء الهضم.

Objectives: To determine the prevalence and determinants of uninvestigated dyspepsia in the Iranian population.

Methods: A cross-sectional study conducted in Tehran province from May 2006 to December 2007, included 18,180 adult persons selected randomly. The study took place at Shahid Beheshti University, MC, Tehran, Iran. A questionnaire was completed in 2 steps. In the first part, personal characteristics and 11 gastrointestinal symptoms were inserted. Those who reported at least one of these 11 symptoms were referred for the second interview, which consisted of questions on different gastrointestinal disorders based on Rome III criteria, including uninvestigated dyspepsia.

Results: The prevalence rate of uninvestigated dyspepsia was 8.5% (10.9% in women and 6.4% in men). Among the subjects diagnosed with dyspepsia, bothersome postprandial fullness was the most common symptom (41.5%). Uninvestigated dyspepsia was more common in low educated and widowed participants. Approximately 41.4% of patients had a history of depression, and 66.1% had self report of stress. The prevalence of functional irritable bowel syndrome in patients with uninvestigated dyspepsia was 8.3% and gastroesophageal reflux disease was 64.9%.

Conclusion: Uninvestigated dyspepsia has a less common prevalence in the general Iranian population than developed countries. Women, older, obese, widowed, and low education subjects are more likely to suffer from dyspepsia.

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Dyspepsia is a remarkably common symptom in the general population.[1] The prevalence has varied between 7-34.2%.[2-6] The definition of dyspepsia remains controversial.[7] Guidelines from the United Kingdom[8] and Canada[9] use the term to mean all symptoms referable to the upper gastrointestinal tract, whereas the Rome II definition[10] excludes patients with predominant reflux symptoms. Dyspepsia is estimated to account for 2-5% of primary care office visits and 30% of consultations by a gastroenterologist.[11-14] Dyspepsia has a significant impact on quality of life[15] and results in enormous societal costs, both direct medical costs for physician visits, diagnostic tests, and medications, and indirect costs from absenteeism or diminished productivity at work.[16] Functional dyspepsia is not the same as uninvestigated dyspepsia. Having made a diagnosis of functional dyspepsia, a number of investigations have been performed and found normal, especially those who underwent upper gastrointestinal endoscopy, upper abdominal ultrasonography, and routine hematology and biochemistry screening blood tests.[17] Uninvestigated dyspepsia (UD) is a diagnosis in which new onset or recurrent dyspepsia occurs in persons in whom no diagnostic investigations have yet been performed and a specific diagnosis that explains the dyspeptic symptoms has not been determined.[18] Patients were called "investigated" when they had upper gastrointestinal symptoms in primary care.[19] Because clinical samples are not representative of the general community; dyspepsia should be studied by population in order to avoid selection bias.[20] The prevalence of UD was not determined, and it remains poorly defined in Iran. The risk factors of UD also remain poorly described in the general population. Defining these risk factors would help to risk-stratify individuals with uninvestigated dyspepsia. So that work up would be reserved for subjects who are at a higher risk. The aim of this study is to determine the prevalence and risk factors for UD in an Iranian population.

Methods. This study was a cross-sectional household survey conducted from May 2006 to December 2007 in Tehran province, Iran which was designed to investigate the prevalence of gastrointestinal symptoms and disorders and related factors.[21-24] A total of 18180 adult persons selected randomly on the basis of the list of postal codes and systematic samples of these postal codes and their related address were drawn from the databank registry of Tehran central post office (approximately 5000 households selected and all members surveyed). These random samples covered 5 cities including Tehran metropolitan, Damavand, Varamin, Firoozkouh, Pakdasht and their rural areas (approximately 10% of samples came from rural areas and samples were selected

on the basis of health dossiers). The trained health personnel of their corresponding local health center were referred to each selected house. They were instructed to ask every household to participate in the first interview according to the first part of our questionnaire. Before the interview, the interviewer explained the purpose of these questions to all eligible individuals and requested their participation. The Ethics Committee of the Research Center approved the research protocol for Gastroenterology and Liver Diseases, Shaheed Beheshti Medical University, Tehran, Iran and all persons who participated in the study signed the consent form.

The questionnaire included 2 parts; the first part consisted of questions, in which personal and family characteristics such as age, gender, occupation, and educational level, were inserted. In addition to this, the interviewers were asked regarding 11 gastrointestinal symptoms including: abdominal pain or distress, constipation, diarrhea, bloating, heartburn, acid regurgitation, proctalgia, nausea and vomiting, fecal incontinence, existence of blood in the stool or black stool (melena), weight loss or anorexia, and difficulty in swallowing. Those who reported at least one of the 11 gastrointestinal symptoms were included in the second interview. The second part of the questionnaire consisted of questions on different gastrointestinal disorder on the basis of Rome III criteria.[25,26] The section of Rome III criteria was standardized in Persian and translated from English to Persian. Uninvestigated dyspepsia was defined as a patient who had one or more of the following symptoms for the last 3 months with symptoms onset at least 6 months before diagnosis. These symptoms consist of: bothersome postprandial fullness, early satiation, epigastric pain, and epigastric burning. Some demographic and clinical variables including gender (male/female), age, marital status (single, married, widow), education (less than high school, high school, college), tobacco smoking (non-smokers, and current-smokers of cigarettes, cigars, and pipes), stress, depression, experiencing catastrophic events and body mass index (BMI), were included in the analysis. Patients with GI symptoms were measured the height and weight using the equation of BMI = weight (kg)/height square (m²). The BMI was calculated and grouped into 3 categories: "being underweight and normal weight" established when the BMI was less than 25 kg/m²; "being overweight" when BMI was between 25 and 29.9 kg/m²; and "being obese," when BMI was 30 kg/m². These definitions are consistent with the recommendations of the World Health Organization.[27] Stress and depression were defined according to self-report of patient. Catastrophic events were defined if patients reported at least experiencing one of these 4 events during the last year; losing a first degree family

member, car crash, bankrupt, and infected with severe disease according to patient's self-report. In addition, gastroesophageal reflux disease (GORD) was defined in this study as an individual who had heartburn and/or acid regurgitation at least once a week for the last 3 months. Heartburn was defined as a burning feeling that rises through the chest, and acid regurgitation was defined as liquid coming back into the mouth and leaving a bitter or sour taste. The questions used to diagnosed reflux were derived from a questionnaire designed by Locke et al[28] and validated in Persian.[23,24]

All statistical analysis was carried out using SAS version 9.1. Analysis of variance was used to compare the means of continuous variables and Pearson's chi-square and contingency tables were performed to test for independence between discrete classification variables. A $p<0.05$ was considered statistically significant and all reported P values were 2 sided.

Results. A total of 18180 participant entered to this cross-sectional study. The response rate was more than 92%, and those who refused to participate in the interview was replaced with additional random samples. The demographic features of participants are presented in **Table 1**. The median and mean age of participants were 36 and 38.7 years (SD: 17.1). Among these participants, 9072 (49.9%) were women. Most participants were in the age group 16-29 years in both male and female groups. A total of 2931 participants had at least one gastrointestinal symptom. All of these persons were referred to participate in the second interview to complete the second part of questionnaire. Among them 1547 adult persons had functional dyspepsia based on ROM III criteria. The prevalence rate of UD was 8.5% (8.1-8.9). The prevalence rates of functional dyspepsia by sociodemographic characteristics are presented in **Table 2**. The prevalence rate of UD was higher in females; in age group >70 years and in widowed participants, compared to single and married participants ($p<0.001$). Also the prevalence rate of UD was higher in low educated participants ($p<0.001$). No difference was observed between rural and urban. The clinical features of participants are shown in **Table 3**. Bothersome postprandial fullness was the most common symptom, followed by epigastric pain, and early satiation. Up to 52% of patients were overweight or obese (the distribution of obesity in all 2931 participants who reported GI symptoms were 33% being overweight and 27% being obese). In addition, 32.3% of patients experience at least one or more catastrophic event. An overlap was observed between UD and GORD; 64.9% of patients with UD, diagnosed with GORD. Therefore, patients were categorized into 2 subgroups (UD patients with or without GORD).

Table 1 - Demographic data of sampled population (N=18,180).

Demographic data	Male (n=9108)	Female (n=9072)	*P*-value
Mean age (years)	38.95±17.4	38.40±16.7	<0.001
Age range (%)			
16-29 years	3060 (33.6)	3502 (38.6)	<0.001
30-39 years	1721 (18.9)	1724 (19.0)	
40-49 years	1494 (16.4)	1542 (17.0)	
50-59 years	1011 (11.1)	1052 (11.6)	
60-69 years	683 (7.5)	689 (7.6)	
70-79 years	510 (5.6)	408 (4.5)	
>80 years	173 (1.9)	118 (1.3)	
Education (%)			
Less than high school	1621 (17.8)	2292 (25.3)	<0.001
High school	5738 (63.0)	5234 (57.7)	
College	1748 (19.2)	1533 (16.9)	
Marital status (%)			
Single	3151 (34.6)	2458 (27.1)	<0.001
Married	5875 (64.5)	5878 (64.8)	
Widow	55 (0.6)	662 (7.3)	
Residence			
Rural	925 (10.2)	855 (9.4)	
Urban	8183 (89.9)	8217 (90.6)	0.1

Table 2 - Prevalence rates of uninvestigated dyspepsia per 100 persons with 95% confidence intervals (CI) by sociodemographic characteristics.

Parameters	No. of infected	Prevalence per 100 Person (95% CI)	*P*-value
Gender			
Male	559	6.1 (5.6-6.6)	<0.001
Female	988	10.9 (10.2-11.5)	
Age			
16-29	277	4.2 (3.7-4.7)	<0.001
30-39	309	8.9 (8.0-9.9)	
40-49	306	10.0 (9.0-11.1)	
50-59	286	13.9 (12.4-15.4)	
60-69	189	13.8 (11.9-15.6)	
>70	185	15.3 (13.3-17.3)	
Marital status			
Single	194	3.5 (3.0-3.9)	<0.001
Married	1206	10.3 (9.7-10.8)	
Widow	124	17.3 (14.5-20.1)	
Education			
College	210	12.0 (10.5-13.5)	<0.001
High school	831	14.5 (13.6-15.4)	
Less than high school	494	30.5 (28.2-32.7)	
Residence			
Rural	140	6.8 (5.6-8.0)	0.08
Urban	1407	7.9 (7.6-8.3)	

Table 3 - Distribution of clinical features in patients with uninvestigated dyspepsia.

Clinical features	N	Percent per 100 persons
Symptoms		
Bothersome postprandial fullness	1216	(41.5)
Early satiation	635	(21.7)
Epigastric pain	1172	(40.0)
Functional irritable bowel syndrome		
Yes	132	(8.3)
Gastroesophageal reflux disease		
Yes	1008	(64.9)
Body mass index		
<25	668	(47.8)
25-30	528	(37.8)
>30	201	(14.4)
Smoking		
Current smokers	144	(9.3)
Self report of depression		
Yes	647	(41.4)
No	916	(58.6)
Self report of stress		
Yes	1022	(66.1)
No	525	(33.9)
Catastrophic events during the last year		
Dying relatives	298	(18.4)
Accident	79	(4.9)
Bankrupt	108	(6.7)
Severe disease	126	(7.8)

Table 4 - Comparing dyspepsia patients with or without gastroesophageal reflux disease (GORD) according to clinical and demographic features.

Demographic features	Percent per 100 persons		*P*-value
	With GORD	Without GORD	
Age*			
>46	51.1	52.6	0.57
Gender			
Female	62.1	64.6	0.29
Functional IBS			
Yes	6.1	9.4	0.02
Body mass index			
<25	15.9	49.2	
25-30	38.9	37.2	<0.001
>30	45.1	13.6	
Smoking			
Current smokers	9.7	9.0	0.64

* Using median age of all UD patients, IBS - irritable bowel syndrome

Results indicated that UD patients with GORD were more obese than those without GORD, and irritable bowel movement was more frequent in UD patients with GORD at the same time (**Table 4**).

Discussion. This nationwide Iranian survey is the first epidemiological study to estimate the prevalence and potential risk factors of UD using the Rome III criteria. Therefore, the findings are more on the general population than those obtained from studies of patients seen at referral centers. The prevalence of dyspepsia varies in different populations. Although these may be due to epidemiological differences, it is also apparent that the varying definitions used in different studies leads to this discrepancy.[29] In studies using "upper abdominal pain" as the definition, the prevalence of UD has varied between 7-34.2%.[2-6] With this definition, the lowest UD prevalence of 7-8% is seen in Singapore, and South East Asia.[4] Prevalence rates of 23-25.8% are seen in the US,[2] 30.4% in India,[5] 34.2% in New Zealand,[6] and the highest was in Argentina 43.2%.[20] The results showed that the higher rate of UD was in women. Female gender was found to be an independent risk factor for UD in a study conducted in Taiwan[30] and Australia, and adult females significantly outnumbered adult males in functional dyspepsia.[31] Age was another significant demographic factor that influenced the rate of UD. All previous surveys have examined adults ≥18 years old. Prevalence of UD appeared to peak in Chinese aged 41-50 years,[32] although other studies reported that the prevalence of UD decreases with increasing in age.[30] We observed that UD was more common in low educated groups. Most population-based studies examined the basic sociodemographic associations in dyspepsia. A study by Curioso et al[33] in a native community of the Peruvian jungle revealed that poor and less educated persons had increased risk for UD.[33] In our study, the prevalence rate of UD was higher in widowed participants compared to single or married, and 37.8% of patients reported experiencing catastrophic events during the last year, and 42% reported depression and 66.1% of patients reported stress. Similar results were observed in an Australian survey where adults with UD scored highly on anxiety and depression scales.[31] A Chinese study which revealed "pressure from society" and "destructive living habit" depression and anxiety as risk factors for UD[32] and a survey carried out in Hong Kong showed that patients with UD had more anxiety.[34] In addition, a recent study in Belgium showed symptom severity and weight loss in UD was determined by psychosocial factors including depression.[35] A total of 9.3% of patients were current

smokers. The relation between smoking and dyspepsia is still skeptical, although in some population-based studies smoking has not been shown to be a risk factor.[31,32] In another survey, regular smoking is considered as a risk factor for UD.[5,36] Approximately half of UD patients in our study were overweight or obese. A recent community-based case-control study in Olmsted County in the US showed that BMI was associated with frequent vomiting, upper abdominal pain, bloating and diarrhea.[37] Nevertheless, the Netherland study did not show any significant association.[38] We observed considerable overlap between UD and gastroesophageal reflux. Haque et al,[6] found that half of the participants with functional dyspepsia (and uninvestigated dyspepsia) have reflux disease;[6] however, a study in Argentina reported only 13.6%.[20] Results showed that patients who were infected with both UD and GORD were more overweight or obese than patients with UD only; however, our previous study with the same data did not revealed any association between GORD and BMI.[24] Also, coexistence of irritable bowel syndrome and UD in the presence of GORD was higher, and this was confirmed with our previous study that aimed to evaluate the coexistence of GORD and IBS.[23]

This current study has a number of strengths. We used explicit and clinically relevant criteria based on Rome III criteria. The major strengths of the study are it was population based, and we used a randomized recruitment strategy. The large sample size provided both statistical precision and permitted detailed examination of variation in prevalence by demographic features. Because patients were sampled from a general population in our study, the selection biases that might apply to a specialist or hospital-derived sample do not arise. The limitation of this study is that we did not collect detailed data on treatment status, or disease severity. Also, we did not study the socioeconomic status and diet in our population, and, psychological factors were based on the patient's self-reported stress and depression. In the future, data should be obtained on all cases with UD for the above issues.

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Related topics

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