Prevalence of Dyspepsia and its Correlation with Demographic Factors and Lifestyle in Shiraz, Southern Iran

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ABSTRACT

BACKGROUND

Dyspepsia is a common disorder that can present many clinical dilemmas in patient management. Although not life-threatening, the symptoms are long-lasting, interfere with daily activities and have a significant impact upon quality of life. The aim of this study was to determine prevalence of dyspepsia and its relationship with demographic and socioeconomic factors, and lifestyle in an apparently healthy population in Shiraz, southern Iran.

METHODS

In a population-based study, 1978 subjects aged 35 years or older were interviewed from April to September 2004. A questionnaire consisting of demographic factors, lifestyle data and gastrointestinal symptoms was completed for each participant. The validity and reliability of the questionnaire were determined.

RESULTS

The prevalence of dyspepsia was 29.9%. The dyspeptic patients were classified as having ulcer-like (27.9%), dysmotility-like (26.2%) or unspecified dyspepsia (45.9%). The prevalence was higher in females, water-pipe smokers, NSAIDs users, and in those with psychological distress, recurrent headache, anxiety, nightmares and past history of gastrointestinal disease. Dyspepsia had an inverse relationship with consumption of pickles, fruits and vegetables, and with duration of meal ingestion. Subjects with dyspepsia symptoms were more likely to restrict their diet, take herbal medicine, use over-the-counter drugs, consult with physicians and consume medication advised by their friends.

CONCLUSION

This study reveals that dyspepsia has a high prevalence in Shiraz, southern Iran and is associated with several demographic factors, lifestyle and health-seeking behavior.

KEYWORDS

Dyspepsia; Prevalence; Epidemiology; Lifestyle

INTRODUCTION

Dyspepsia is a common disorder that can present many clinical dilemmas in patient management.[1] It refers to upper abdominal pain or discomfort, which is thought by the physician to arise in the upper gastrointestinal tract.[2] Dyspepsia is a global concern, although most of the published data have arisen from western countries. It is assumed that dyspepsia in populations from developing countries is mostly organic in nature, whilst functional dyspepsia is more prevalent in western nations.[3]

Studies from Europe, North America and Oceana have shown the prevalence rates of dyspepsia to vary between 3% and 40%.[4] This variation in prevalence rates may be related to differences in the definition of dyspepsia in those studies.[5] Although not life-threatening, the symptoms are long-lasting.[6]

Symptoms interfere with daily activities and have a significant impact upon the quality of life and increased medical costs.[7] Although differences between dyspeptic populations from various parts of the world have been inferred, there is a paucity of data directly comparing dyspepsia in different countries.

Studying the differences in dyspepsia between various populations will enhance global understanding of the condition, facilitate better international research and allow more appropriate clinical management strategies.[8] While clinical factors have clear importance, the potential impact of non-clinical factors, such as socioeconomic and psychological health has received little attention.[9]

We have previously reported the prevalence of gastroesophageal reflux disease[10] and irritable bowel syndrome (unpublished data) as well as the correlation between subjective lactose intolerance and irritable bowel syndrome[11] in the same population and area.

The aim of the present analysis was to determine the prevalence of dyspepsia and its relationship with demographic and socioeconomic factors, and lifestyle in an apparently healthy population in Shiraz, southern Iran.

MATERIALS AND METHODS

In a population-based study, 3600 subjects were enrolled using a cluster random sampling method based upon the postal code division of Shiraz, southern Iran divided into 17 districts. The research project was explained for each participant and each subject received an invitation letter to refer to the Mottahari Digestive Clinic affiliated with Shiraz University of Medical Sciences.

The study was approved by the Shiraz University of Medical Sciences Ethics Committee and a written consent was provided from each participant. The study started in April 2004 and terminated in September 2004. A total of 1978 subjects completed the questionnaire. The inclusion criteria were age older than 35 years, of both genders, and from both urban and rural areas.

A team of interviewers underwent intense training to complete the questionnaire which was divided into three parts: demographic factors, lifestyle and gastrointestinal symptoms. A gastroenterologist recorded the clinical questions. The reliability and validity of the questionnaire were determined by asking 100 subjects to be interviewed by both identically trained interviewers and a gastroenterologist, respectively.

Sociodemographic variables included age, gender, marital status, educational level, habitat [rural or urban, defined by the size of the residence area (under 30000 inhabitants vs. 30000 inhabitants or more)], lifestyle such as physical activity (at least 30 min/week or sufficient to produce adequate sweating), dietary habits, cigarette smoking, alcohol, coffee and tea consumption, as well as biological characteristics such as BMI [fasting weight (kg) divided by height (m^2), resulting in five categories: thin (<18 kg/m^2), normal (18-24.9 kg/m^2), overweight (25-29.9 kg/m^2), obese (30-40 kg/m^2) and very obese (>40 kg/m^2)], and the use of aspirin and NSAIDs. Dyspepsia was defined as epigastric or upper abdominal symptoms (pain or discomfort) lasting for at least three months

continuously for intermittently during the past year. Based on the predominant symptom, dyspepsia was divided into three entities of ulcer-like (localized pain that was aggravated by hunger alleviated with food or antacids, or caused nocturnal awaitnig or the abscence of pain for at least two weeks after which it recurred), dysmotility-like (pain aggravated by food or the presence of post-prandial fullness) and unspecified (neither of the previous categories).

Statistical analysis was undertaken by SPSS software package (Version 11.5, Chicago, IL).

A $p<0.05$ was considered significant and the Chi-Square test was applied for analysis.

RESULTS

Among 3600 individuals, the questionnaire was completed in 1978 subjects (response rate: 54.9%; mean age: 44.9 ±11.1 years; 35.8% male). A total of 592 subjects reported dyspepsia (29.9%). Among these, 165 individuals had ulcer-like dyspepsia (27.9%), 155 dysmotility-like dyspepsia (26.2%) and 272 unspecified dyspepsia (45.9%) (Table 1).

Table 1: Prevalence of different types of dyspepsia in Shiraz, southern Iran.

		Frequency	% within study population	% within dyspeptic patients
	No	1386	70.1	-
Dyspepsia	Ulcer-like	165	8.3	27.9
Yes	Dysmotility-like	155	7.8	26.2
	Unspecified	272	13.8	45.9
Total		1978	100.0	100.0

Table 2 shows the prevalence rates of dyspepsia in relation to demographic data demonstrating that the dyspepsia was more common in women

(33.6%, P=0.001). An association was noticed between dyspepsia symptoms and psychological distress (55.6%, p=0.001), recurrent headache (46.7%,

Table 2: Correlation of dyspepsia with different characteristics of subjects in Shiraz, southern Iran (n = 1978).

Characteristics		Dyspepsia [no. (%)]		p-value
		No	Yes	
Gender	Male	543 (76.6)	166 (23.4)	0.001
	Female	843 (66.4)	426 (33.6)	
Age (years)	35-44	502 (68.4)	232 (31.6)	0.054
	45-54	444 (68.7)	202 (31.3)	
	55-64	244 (71.1)	99 (28.9)	
	>65	195 (77.1)	58 (22.9)	
Residence	Urban	868 (69.8)	375 (30.2)	0.746
	Rural	512 (70.5)	214 (29.5)	
Education	Illiterate	280 (66.8)	139 (33.2)	0.215
	Primary school	431 (70.1)	184 (29.9)	
	High school	531 (70.8)	219 (29.2)	
	University	141 (75.0)	47 (25.0)	
Psychological distress	No	1350 (71.2)	547 (28.8)	0.001
	Yes	36 (44.4)	45 (55.6)	
Recurrent headache	No	1289 (71.8)	507 (28.2)	0.001
	Yes	97 (53.3)	85 (46.7)	
Anxiety	No	633 (77.1)	188 (22.9)	0.001
	Yes	753 (65.1)	404 (34.9)	
Nightmare	No	1045 (73.0)	386 (27.0)	0.001
	Yes	341 (62.3)	206 (37.7)	
Past GI disease history	No	1127 (73.9)	398 (26.1)	0.001
	Yes	259 (57.2)	194 (42.8)	
BMI	Thin	10 (58.8)	7 (41.2)	0.159
	Normal	448 (70.8)	185 (29.2)	
	Overweight	619 (71.6)	245 (28.4)	
	Obese	306 (66.4)	155 (33.6)	

GI: gastrointestinal

p=0.001), anxiety (34.9%, p=0.001), nightmares (37.7%, p=0.001) and past history of gastrointestinal diseases (42.8, p=0.001).

Table 3 denotes the prevalence of dyspepsia in relation to dietary, smoking and drinking habits and medication usage. A lower prevalence was observed among subjects who consumed pickles (28.1%, p=0.10.6) and those who ate fruits and vegetables (29.4%, p=0.034), but a higher prevalence in those who smoked water pipes (37.4%, p=0.003).

Dyspepsia was inversely correlated with duration of meal ingestion (p=0.004). Dyspepsia prevalence showed an increase as the duration of meal ingestion decreased. No association was seen between dyspepsia and drinking spirits (p=0.610) or water (p=0.829) with meals, eating fried foods (p=0.904) or fast foods (p=0.570), salt intake (p=0.778) and physical activity (p=0.567).

The association between dyspepsia and subjects being current or former cigarette smokers was not

Table 3: Prevalence of dyspepsia in relation to lifestyle of subjects in Shiraz, southern Iran (n=1978).

Lifestyle		Dyspepsia [no. (%)]		p-value
		No	Yes	
Pickles	No	355 (65.3)	189 (34.7)	0.004
	Yes	1031 (71.9)	403 (28.1)	
Salt	No	984 (69.9)	424 (30.1)	0.778
	Yes	402 (70.5)	168 (29.5)	
Fried food	No	91 (70.5)	38 (29.5)	0.904
	Yes	1295 (70.0)	554 (30.0)	
Fast food	No	1033 (70.4)	434 (29.6)	0.570
	Yes	353 (69.1)	158 (30.9)	
Fiber (fruits and vegetables)	No	58 (60.4)	38 (39.6)	0.034
	Yes	1328 (70.6)	554 (29.4)	
Cigarettes	No	1243 (70.1)	531 (29.9)	0.991
	Yes	143 (70.1)	61 (29.9)	
Water pipe	No	1212 (71.3)	488 (28.7)	0.003
	Yes	174 (62.6)	104 (37.4)	
Tea	No	545 (69.1)	244 (30.9)	0.431
	Yes	841 (70.7)	348 (29.3)	
Coffee	No	1368 (70.3)	579 (29.7)	0.141
	Yes	18 (58.1)	13 (41.9)	
Spirits with meal	No	701 (70.6)	292 (29.4)	0.610
	Yes	685 (69.5)	300 (30.5)	
Water with meal	No	445 (69.7)	193 (30.3)	0.829
	Yes	941 (70.2)	399 (29.8)	
Alcohol	No	46 (74.2)	16 (25.8)	0.465
	Yes	1336 (69.9)	576 (30.1)	
Feeding duration (min)	<10	414 (67.1)	203 (32.9)	0.004
	10-20	671 (69.5)	294 (30.5)	
	>20	262 (76.6)	80 (23.4)	
Physical activity	No	885 (70.5)	370 (29.5)	0.567
	Yes	501 (69.3)	222 (30.7)	
Aspirin	No	1235 (70.5)	535 (29.5)	0.245
	Yes	133 (66.5)	67 (33.5)	
NSAIDs	No	1055 (72.4)	402 (27.6)	0.001
	Yes	331 (63.5)	190 (36.5)	

More symptoms were observed in subjects who took NSAIDs (36.5%, p=0.001), but not in those who took aspirin (p=0.245).

Subjects with dyspepsia symptoms were more likely to restrict their diets (44.3%, p=0.001),

take herbal medicine (40.4%, p=0.001), use over-the-counter drugs (52.4%, p=0.001), consult with physicians (48.6%, p=0.001) and consume medication advised by their friends (63.2%, p=0.001) (Table 4).

Table 4: Health-seeking behavior of subjects with dyspepsia in Shiraz, southern Iran (n=1978).

Health-seeking behavior		Dyspepsia [no. (%)]		*p*-value
		No	Yes	
Diet restriction	No	998 (77.8)	284 (22.2)	0.001
	Yes	388 (55.7)	308 (44.3)	
Herbal medicine intake	No	950 (76.2)	297 (23.8)	0.001
	Yes	436 (59.6)	295 (40.4)	
Medications advised by friends	No	1361 (71.3)	549 (28.7)	0.001
	Yes	25 (36.8)	43 (63.2)	
Over-the-counter drugs	No	1219 (74.9)	408 (25.1)	0.001
	Yes	167 (47.6)	184 (52.4)	
Visiting physician	No	1042 (79.6)	267 (20.4)	0.001
	Yes	344 (51.4)	325 (48.6)	

DISCUSSION

The prevalence of dyspepsia in our population-based study was 29.9% which was similar to the rates reported by Talley and colleagues in the US population (25%)[12] and by another study in the UK (21%).[13]

In China, however, the prevalence of dyspepsia was lower (18.4%)[14] which could be due to the difference in definition.

In the same population studied, we previously reported a prevalence of 15.4% for gastroesophageal reflux disease,[10] 28.4% for subjective lactose intolerance[11] and 10.9% for irritable bowel syndrome (unpublished data). Moreover, we found that subjective lactose intolerance correlated with irritable bowel syndrome.[11]

When the dyspeptic participants in our study were divided into subgroups of ulcer-like, dysmotility-like and unspecified, the proportion of subjects in each group was 27.9%, 26.2%, and 45.9%, respectively. These rates were comparable with those reported by a survey in England on dyspeptic patients among whom 30% had ulcer-like dyspepsia and 32% had dysmotility-like dyspepsia.[15]

In another study in China, 50.2% of dyspeptic patients had non-specific dyspepsia[14] which further confirmed our findings.

Dyspepsia was more prevalent among our female subjects. Similarly, dyspepsia was more common in women in the United States.[4] In comparison, dyspeptic patients in a study by Maconi et al. had a nearly equal gender distribution while complaints of severe pain were more frequent among female patients.[16] In the latter study, most dyspeptic patients were aged 35-50 years,[16] while other studies indicated a decline in the prevalence of dyspepsia symptoms with age.[13,17]

Stanghellini also reported that dysmotility-like symptoms decreased with age.[18] However, we failed to find a relationship between dyspepsia and age which was parallel to the result of a large-scale study in the US that found no association between age and prevalence of ulcer-like or dysmotility-like symptoms.[19]

On the other hand, we noticed a significant association between dyspepsia and psychological distress, recurrent headaches, anxiety and nightmares. This was in keeping with the findings of Hu and colleagues in China who reported that average anxiety and depression scores were higher in patients with dyspepsia in comparison to those with no dyspepsia.[14]

Similarly, Barzkar et al. study in Tehran showed that 41.4% of patients with uninvestigated dyspepsia had a history of depression and 66.1% self-reported stress.[20] Likewise, in their study of primary care patients with organic or functional dyspepsia, Pajala and colleagues concluded that mental distress was common in these patients and recommended that mental distress should be taken into consideration when treating dyspepsia.[21]

Moreover, dyspepsia was more common among our subjects who had a past history of gastrointestinal disease. While we did not observe an association between dyspepsia and BMI, Shaib and El-Serag indicated a slightly higher average BMI in

subjects with dyspepsia.[4] Our study indicated that dyspepsia prevalence had a reverse relationship with the consumption of pickles, fruits and vegetables. This does not necessarily mean that dyspepsia occurs less frequently in people with such eating habits.

We speculate that individuals suffering from dyspepsia may abstain from these foods to prevent dyspeptic symptoms. We found that although dyspepsia had no association with cigarette smoking, its prevalence was higher in people who smoked water pipes.

According to Shaib and El-Serag, dyspeptic subjects were more likely to report smoking than those without dyspepsia,[4] whereas Massarrat pointed out that further population-based studies were needed to determine the role of smoking in non-ulcer dyspepsia.[22]

In a study by Shaib and El-Seraj, both dyspeptic and non-dyspeptic groups had similar proportions of subjects with histories of coffee or alcohol intake.[4] This is parallel to our finding of no significant association between dyspepsia and drinking alcohol or coffee. In addition, we have observed an inverse relationship between dyspepsia and the duration of meal ingestion.

This is expected since those who eat fast may not chew food properly which may in turn cause fullness and discomfort. While dyspepsia prevalence was higher in our subjects who were taking NSAIDs, it had no association with aspirin intake. In comparison, a study in the US showed that the proportion of individuals using aspirin or NSAIDs was greater among subjects with dyspepsia.[4]

We observed a significant association with health-seeking behaviors such as restricting diet, taking herbal medicines, using over-the-counter drugs, consulting with a physician and consuming medications advised by friends. Hu et al. have also reported a significant correlation between a diagnosis of dyspepsia and increased health-care utilization.

In their study, 14% of dyspeptic patients had bought over-the-counter medications, 36% visited an out-patient clinic and 6% referred to the accident and emergency department for dyspepsia.[14]

The present study revealed a high prevalence of dyspepsia in Shiraz, southern Iran. Dyspepsia was associated with female gender, psychological distress, recurrent headache, anxiety, past history of gastrointestinal disease, water-pipe smoking and NSAIDs intake.

The prevalence was lower in those who consumed pickles, or fruits and vegetables. Subjects with dyspepsia symptoms were also more likely to restrict their diet, take herbal medicine, use over-the-counter drugs, consult with physicians and consume medication advised by their friends.

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CONFLICT OF INTEREST

None declared.

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