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Overlap of symptoms of dyspepsia and gastroesophageal reflux in the community

Toplumda gastroözefageal reflü ve dispepsi semptomlarının örtüşmesi

Gül KİTAPÇIOĞLU[1], Aliye MANDIRACIOĞLU[1], Canan CAYMAZ BOR[2], Serhat BOR[3]

Departments of [1]Public Health, [2]Anesthesiology, Section of [3]Gastroenterology, Ege University Faculty of Medicine, Izmir

Background/aims: *Dyspepsia and gastroesophageal reflux disease are common chronic diseases. In the clinical setting, some patients express both problems together; however, little is known about the real prevalence of the presence of the two symptoms. Turkey is particularly interesting because of differences observed from developed countries. We aimed to derive data from our previous prevalence of gastroesophageal reflux disease study and evaluate the overlap of the two symptoms.* ***Methods:*** *We used a previously validated and culturally adapted reflux questionnaire, which was translated into Turkish. The questionnaire was applied to 630 randomly selected subjects older than 20 years living in a population of 8857 adults.* ***Results:*** *28.6% (180/630) of all responders defined dyspepsia within the last 12-month period. When symptom prevalence was considered at least weekly, the prevalence was 10% for heartburn, 15.6% for acid regurgitation, and 20% for either symptom. While the prevalence of gastroesophageal reflux disease was 29.4% in patients with dyspepsia, dyspepsia was found in 43.1% of patients with gastroesophageal reflux disease. Only 21% of symptomatic subjects or 8.4% of the entire study population had both symptoms. Dyspepsia was defined as the most bothersome symptom. 54.3% of all dyspeptic patients and 67.3% with both gastroesophageal reflux disease and dyspepsia used a gastric medication (p>0.05). 29.9% of subjects with dyspeptic symptoms defined antacid consumption and 28.3% acid inhibitor therapy.* ***Conclusion:*** *Dyspepsia was defined as the most bothersome symptom compared to gastroesophageal reflux disease symptoms. The prevalence of dyspepsia in patients with gastroesophageal reflux disease is more common than vice versa. However, the overlap of the two symptom groups was lower than expected in this low-income, Caucasian population.*

Key words: Dyspepsia, gastroesophageal reflux disease, GERD, prevalence, overlapping

Amaç: *Dispepsi ve gastroözofageal reflü hastalığı sık rastlanan kronik hastalıklardır. Klinikte bu iki semptomun gerçek sıklığı bilinmese de bazı hastaların her iki semptomu birlikte belirttikleri gözlenmektedir. Türkiye gelişmiş ülkelerden farklılıkları ile ilgi çekicidir. Veriler daha once yapılmış olan gastroözofageal reflü hastalığı prevalansı çalışmasından elde edilmiş ve her iki semptomun örtüşmesi araştırılmıştır.* ***Yöntem:*** *Daha önce Türkçe'ye çevrilerek, kültürel adaptasyonu, güvenilirlik ve geçerlilik çalışması yapılmış olan reflü anket formu kullanılmıştır. Anket formu 20 yaş üzeri 8857 erişkinden rastgele seçilen 630 kişiye uygulanmıştır.* ***Bulgular:*** *Son 12 aylık süreçte katılımcıların %28,6 (180/630)'sı dispepsi yakınması olduğunu belirtmiştir. Semptom sıklıkları değerlendirilirken haftada bir ve daha sık olmak üzere, pirozis sıklığı %10, asit regürjitasyonu sıklığı %15,6, iki semptomdan biri olanların oranı ise %20 bulunmuştur. Dispepsi yakınması olan bireylerde gastroözofageal reflü hastalığı prevalansı %29,4, iken, gastroözofageal reflü hastalığı olanlarda dispepsi yakınması sıklığı ise %43,1 bulunmuştur. Semptomlu bireylerin sadece %21,0'i ve tüm çalışma grubunun %8,4'ü her iki semptomu birlikte belirtmişlerdir. Dispepsinin, gastroözofageal reflü hastalığına en sık eşlik eden semptom olduğu gözlenmiştir. Tüm dispeptik hastaların %54,3'ü ve dispepsi ile eş zamanlı gastroözofageal reflü hastalığı olanların %67,3'ü gastrik medikasyon aldığını bildirmiştir (p>0.05). Dispeptik semptomu olanların %29,9'u antasit %28,3'ü asit inhibitör tedavi aldığını bildirmiştir.* ***Sonuç:*** *Dispepsi, gastroözofageal reflü semptomları ile karşılaştırıldığında en fazla rahatsızlık veren semptomdur. Gastroözofageal reflü hastalarında dispepsi diğer semptomlardan daha yüksek orandadır. Yapılan bu çalışmada iki semptom grubunun örtüşme oranı, düşük gelirli, beyaz ırka mensup bireylerde beklediğimizden düşük bulunmuştur.*

Anahtar kelimeler: Dispepsi, gastroözefageal reflü hastalığı, GÖRH, prevalans, örtüşme

INTRODUCTION

Both dyspepsia and gastroesophageal reflux disease (GERD) are recognized as the most common chronic diseases of adults in the U.S. (1). These diseases are also important because of the high prevalence rate of the diseases and consumption of limited health care resources. It is well known that prevalence of these diseases determined in Western countries cannot a priori be regarded as rep-

Address for correspondence: Serhat BOR
Department of Gastroenterology, Ege University Faculty of Medicine, 35600, Bornova, Izmir, Turkey
Phone: +90 232 388 19 69 • Fax: +90 232 373 15 47
E-mail: serhat.bor@ege.edu.tr

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resentative of the broader pattern of world disease; more data from developing countries are needed. Currently, there are few GERD and dyspepsia-related prevalence data derived from low-income Caucasian populations in developing or underdeveloped nations. Only a few studies have been performed regarding the combined impact of the two diseases in this population. Such regions are remarkable in that they characteristically exhibit a high rate of *H. pylori* infection, impaired sanitary conditions, and difficulty in accessing health care facilities. Based on the above concerns, we attempted to derive from our previous prevalence study (2), which was conducted in a representative low-income population in a neighborhood of Izmir, Turkey (Menderes), the prevalence of dyspeptic symptoms and the relationship with the symptoms of GERD. Currently there is no detailed population-based study published in Turkey addressing the overlapping of the symptoms of dyspepsia and GERD.

MATERIALS AND METHODS

The study was performed in a small, low-income town, Menderes, in Turkey, about 20 kilometers away from Izmir. The population of Menderes is comprised of 8857 adults, all white. Since all the residents were registered in the government-supported primary health care system, we used this system to draw a random sample of subjects older than 20 years of age. Assuming a maximum GERD or dyspepsia prevalence of 20% in this population, the sample size consisted of 630 adults (95% CI and worst acceptable was ±3%). Seven hundred and fifty-eight addresses were selected randomly, including a substitute for 20% of the subjects. Exclusion criteria included death or relocation from the city before the interview, any mental or psychiatric disease, inability to communicate due to dementia, refusal to attend the survey, or incorrect address or name within the registration system. Interviewers attempted to find each selected subject on three visits on three nonconsecutive days including weekends. If contact was not possible after three attempts, the subject was excluded from the study. When interviewers reached the sample size of 630, interviews were ended.

Development of The Questionnaire

We used a reflux questionnaire derived from Locke et al. (3), previously validated in an English-speaking Western culture, which was translated into Turkish, linguistically validated, and adapted to the cultural profile of Turkey. The validation process was published (4). In summary: process of translation included independent translation, back translation, a pilot test using 15 subjects, and a review and approval by the original questionnaire developers. Feasibility was assessed in terms of percentage of non-response and missing values, difficulty ratings (interviewer and interviewee), and administration time. Test-retest reliability was analyzed for each respondent using the Cohen's kappa coefficients in a sub-sample who repeated the interview 2-3 weeks after the first administration. The test-retest reliability of the Turkish version of the questionnaire was good and Cronbach's alpha values were all higher than 70% for all major symptoms within the 12 months of period prevalence. The questionnaire was administered in face-to face interviews at each subject's home. Statistical evaluation was performed by chi-square, Student's t-test (CI = 95%). The total questionnaire contained 72 questions, plus an additional 29 sub-questions, and included the following:

1. Major (heartburn, regurgitation, dyspepsia) and related (dysphagia, odynophagia, chest pain) symptoms and triggering factors of these symptoms.

2. Associated medical conditions.

3. Past medical history: upper (nausea, vomiting, belching) and lower (abdominal pain or discomfort) gastrointestinal symptoms; respiratory, throat and cardiac problems; number of physician visits and diagnostic procedures related to upper gastrointestinal symptoms; medication use (NSAID, aspirin and all drugs related with upper gastrointestinal complaints and for other health problems); pregnancy; present and previous smoking; and alcohol and regular coffee or tea consumption.

4. Family history.

5. Demographic and socioeconomic data, including: number of household and children, total monthly income, age, weight, height, employment, level of education, and marital status.

While asking questions about dyspepsia, the interviewers routinely pointed to the upper-middle of the abdomen and about heartburn to the middle of the sternum. Since the questionnaire was not specifically designed to detect the prevalence of dyspepsia, it was not possible to fit the data to Rome II or other related diagnostic criteria and these results should be accepted as representing only how the subjects described their symptoms. Irri-

table bowel syndrome symptoms would also not be differentiated with this questionnaire.

RESULTS

Demographics and Response Rate

The questionnaire was administered to 758 randomly selected adult subjects between November 1998 and December 1999, with a response rate of 83.5%, or 630 subjects. There was a slight predominance of females (56.2%). The mean population per household was 4.4 individuals, and the mean income was $75/mo per subject (minimum wage was $100/mo in the country).

Prevalence of GERD and Dyspepsia Symptoms

28.6% (180/630) of all responders defined dyspepsia within the last 12-month period. When symptom prevalence was considered at least weekly, the prevalence was 10% for heartburn, 15.6% for acid regurgitation, and 20% for either symptom. The latter constituted a working definition of GERD. Frequent heartburn and regurgitation were both significantly common in women (X^2; 8.83; p=0.003 for heartburn and X^2; 20.495; p=0.0001 for regurgitation). 76.2% of all frequent refluxers were women. Similarly, dyspepsia was more common in women; 24% of men and 32.3% of women had dyspepsia.

While the prevalence of GERD was 29.4% in patients with dyspepsia, dyspepsia was found in 43.1% of patients with GERD. Only 21% of symptomatic subjects had both symptoms. If subjects were divided into three groups according to the presence of GERD, dyspepsia or both, no difference was found between the three symptomatic groups for age and per household income (Table 1). The prevalence of dyspepsia was 25.5% in patients with body mass index (BMI) ≤25 and 31.3% in patients with BMI >25 (p=0.126) and prevalence of GERD was 18 vs 21.6% for BMI ≤25 and >25, respectively (p>0.05 for all comparisons).

Twenty-one percent of the population defined alcohol consumption and 49.4% smoking; however, no difference was found between subjects with or without dyspepsia and consumption of alcohol or cigarette smoking. Consumption of coffea, tea, and other hot beverages also did not demonstrate any difference between the dyspeptic subjects and the others. Nausea, vomiting and belching were significantly more common in the dyspeptic group (Table 2).

Table 2. The prevalence of nausea, vomiting and belching in subjects with dyspepsia compared to those with GERD

	Dyspepsia (-)	Dyspepsia (+)	GERD (-)	GERD (+)
Belching	20	14.2	11.5	24.6*
Nausea	31.1	54.4 *	24.4	60.3*
Vomiting	19.4	37.2 *	16.3	38.1*

*p<0.05 compared to subjects without the particular symptom

Severity of Symptoms

About half of the subjects with heartburn and one-third of subjects with regurgitation and dyspepsia reported their symptoms either as severe or very severe. An interesting question was related with the most bothersome symptom (Table 3). If all symptoms were present, the most bothersome symptom was reported as dyspepsia.

Medication usage

Questions related to medication use for upper gastrointestinal symptoms were posed using generic names first, and classified as antacids and alginates, or the pharmacological inhibitors of acid secretion, such as H_2 receptor blockers or proton pump inhibitors. H_2 blockers and/or proton pump inhibitor therapy was defined as acid inhibitor medication.

Table 1. Comparison of groups with GERD and/or dyspepsia regarding different parameters (%)

	No GERD or dyspepsia (n = 377, 60%)	GERD (n = 73, 11.6%)	Dyspepsia (n = 127, 20%)	GERD + Dyspepsia (n = 53, 8.4%)	Chi-square (p)
Mean age	43.8±15.4	43.1±13.8	41.5±13.3	44.5±7	NS
BMI	25.8±4.5	26.4±3.7	25.9±4.5	26.6±4.9	NS
Any gastric medication %	17.0	49.3*	54.3*	67.3*	106.8 (0.00001)
Acid inhibitor therapy %	4.2	21.9*	28.3*	39.6*	83.6 (0.00001)
Only antacids %	10.6	30.1*	29.9*	39.6*	47.2 (0.00001)
NSAID %	11.4	21.9*	18.3*	24.5*	14.2 (0.03)
Aspirin %	12.5	8.2	13.4	15.1	1.65 (0.649)

*p<0.05 compared to subjects without symptoms, NS: Nonsignificant

Table 3. The most bothersome symptoms as defined by subjects (% within the subjects who defined the existence of all four symptoms)

Dyspepsia	40.4
Noncardiac chest pain	20.8
Acid regurgitation	19.4
Heartburn	12.2

32.7% of all subjects had used at least one medication related with their upper gastrointestinal problems within the last year. All patients who were taking antacids had been receiving acid inhibitor therapy as well. About half of the subjects with GERD were using some medications for their symptoms. Antacids (21.9%) and acid inhibitors (30.1%) were significantly more common compared to use in subjects without GERD symptoms. 67.7% with frequent heartburn and 54.1% with frequent regurgitation were using a medication for symptoms ($p>0.05$). 54.3% of all dyspeptic patients and 67.3% with both GERD and dyspepsia had used a gastric medication ($p>0.05$). 29.9% of subjects with dyspeptic symptoms defined antacid consumption and 28.3% acid inhibitor therapy (Table 1).

Subjects with GERD (21.9%), dyspepsia (18.3%) and dyspepsia + GERD (24.5%) were taking NSAID significantly more commonly compared to subjects without symptoms (11.3%), but not aspirin when compared to the patients without GERD or dyspepsia (Table 1). Interestingly, subjects with both GERD and dyspepsia were using acid inhibitor therapy and antacids more commonly than subjects without symptoms; however, no difference was found compared to GERD and/or dyspepsia groups.

DISCUSSION

Since the majority of the population with functional gastrointestinal disorders do not seek medical care, population-based surveys are pivotal for assessing the epidemiology of these conditions in the community (5). Both GERD and dyspepsia are recognized as the most common chronic diseases of adults in developed countries. Since both have high prevalence in the community, some overlap should be expected.

Studies regarding the prevalence of GERD and/or dyspepsia are performed mainly in westernized countries (6). We have already published a study to address this problem by administering a culture-specific questionnaire (4) in order to ascertain the prevalence of GERD and GERD complications in an economically depressed region of Turkey. This part of the study aimed to reveal the prevalence of dyspepsia within the same population and compare the prevalence with GERD. This area characteristically exhibits a high *H. pylori* rate and prevalence reaches 74% as detected by urea breath test (Bor et al. unpublished data). We showed that the prevalence of GERD (20%) and complications of GERD are quite similar in western and non-western countries. The dyspepsia rate is also similar with these countries and reached 28.4%. The prevalence of dyspepsia in patients with GERD is more common than vice versa. However, the overlap of the two symptom groups was lower than expected. Only 8.4% of the entire group or 21% of subjects with any symptom had both symptoms (Figure 1). About one-third of the whole population took at least one medication related with their upper gastrointestinal complaints. A majority of the patients with dyspepsia were taking medications. Interestingly, patients with either GERD or dyspepsia were taking NSAID significantly more than subjects without these diseases.

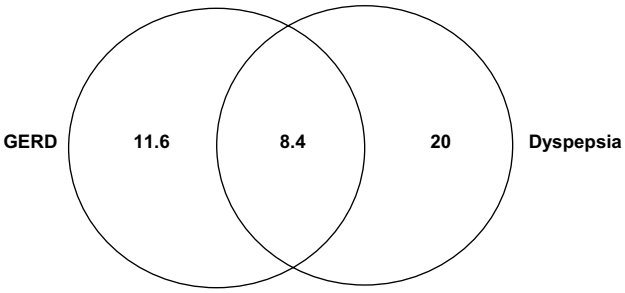

Figure 1. The schematic representation of overlap between GERD and dyspepsia (%)

Symptoms of GER have been reported to be present in 22–50% of dyspeptic patients in the literature (7-10). However, the data is limited and we derived some data from studies which did not directly address the overlap problem. We think from our literature review that the number of published clinical studies is possibly lower than that of review articles. Locke et al. (11) in a study performed in Olmsted county reported the proportions of different functional gastrointestinal diseases, and found a range between 1-8%. The prevalence of dyspepsia and GERD was 7.5%, which was close to

our results. Pure GERD rate was 6.1% and dyspepsia was 3.7% in the study population. Agreus et al. (13, 12) showed that 13.7% of their study population had GERD and dyspepsia (dysmotility-like and ulcer-like). 24.8% of their population defined dyspepsia and 15% (60.5% of all dyspeptics) revealed dyspepsia and GERD symptoms together. A big overlap between the two symptom groups was observed in a Veterans Affairs employees study by Shaib and El-Serag (13). 50.7% of subjects with dyspepsia also revealed GERD symptoms (heartburn and/or acid regurgitation) and 38.5% of subjects with GERD had dyspepsia. This study represents a biased population and did not give any information about the distribution and overlap of symptoms within the whole study population. In an interesting study by Papatheodoridis et al. (14) performed in 700 subjects in a Greek urban population using a questionnaire, the prevalence of one or more gastrointestinal symptoms was 53% within the past week and 55% within the last six months. The definition of GERD was not clear (symptom frequency etc.) in this study. The prevalence of dyspepsia was 48.4% and of GERD was 38.3% during the past six months. The existence of dyspepsia only was 9.6% and of GERD only was 3.7%. The presence of concomitant symptoms was found as 12.7% for the last six months. Fehr (15) revealed the symptom profile of 1071 patients in a general practice setting and showed that about 50% of patients predominantly classified as dyspeptic had heartburn and 38% regurgitation. 80% of patients who were having moderate to severe reflux symptoms defined epigastric discomfort. Talley et al. (16) showed in an urban population that 36.8% of the dyspeptic subjects had ulcer-like and reflux-like dyspepsia. In the reflux group, subjects with irritable bowel syndrome and dyspepsia were the highest functional disorders. One of the pivotal studies showed about five times higher prevalence of dyspepsia within GERD sufferers (17). The prevalence of dyspepsia was 29.3% in a Chinese population from Hong Kong (18).

The data about the prevalence in the developing world related with common gastrointestinal diseases such as GERD, dyspepsia and irritable bowel syndrome is insufficient, and it is accepted as an insignificant public health risk. Turkey is particularly interesting in terms of cultural characteristics of these diseases. The terms "reflux" and "dyspepsia" are practically non-existent in the language and the term "gastritis" is much more common and used for both (2). This misuse of terms resulted in the very low number of GERD diagnoses compared to gastritis. Dyspepsia is a common condition; however, overlap of the two conditions was lower than expected. It should be remembered that our questionnaire was designed specifically to determine GERD and cannot differentiate irritable bowel syndrome. For that reason, results cannot be compared with Rome II or other studies employing dyspepsia-specific questionnaires.

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