The prevalence of chronic obstructive pulmonary disease in Bolu province of Turkey

Bolu ilinde kronik obstruktif akciğer hastalığının prevalansı

Copd in Bolu province of Turkey

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Öz

Amaç: Günümüzde Kronik Obstrüktif Akciğer Hastalığı (KOAH), tüm dünya ülkelerinde önemli bir sağlık sorunu haline gelmiştir. Diğer hastalıkların mortalite oranlarının yıllar içinde düşmesine karşılık KOAH prevalansı ve mortalitesi giderek artış göstermektedir. Bu araştırma Bolu il merkezinde KOAH prevalansını belirlemek amacıyla yapıldı. Material and Method: Bolu il merkezinde oturan, ev tespit fişlerinden rastgele yöntemle seçilen 35 yaş ve üstü 500 kişiye solunum fonksiyon testleri yapıldı. Çalışmaya katılan bireylerden 285'i (%57) erkek, 215'i (%43) kadın idi. KOAH'nın tanısı için 'Obstruktif Akciğer hastalıkları için Global İnsiyatif' kriterleri ile birlikte spirometri kullanıldı. Bulgular: KOAH prevalansı % 8.6 (43 kişi) bulundu. KOAH tespit edilen hastaların hiç biri hafif evrede değildi. % 34.9'i orta, % 41.86'sı ağır ve % 23.25'i çok ağır evrede idi. KOAH tespit edilen hastaların % 97.67'sinde (43 kişiden 42'sinde) sigara içme öyküsü vardı. Çalışmaya katılan erkeklerin % 9.82'sinde (285 kişiden 28 kişide), kadınların % 6,97'sinde (215v kişiden 15 kişide) KOAH saptandı. Tartışma: KOAH'ın, Bolu il merkezinde önemli bir halk sağlığı sorunu olduğu düşünüldü.

Anahtar Kelimeler

Kronik Obstruktif Akciğer Hastalığı; Epidemiyoloji; Prevalans

Abstract

Aim: Chronic Obstructive Pulmonary Disease (COPD) is increasingly recognized as a leading cause of global morbidity and mortality throughout the world. The prevalence and mortality of COPD have increased through years. This study was conducted to explore the prevalence of COPD in the central Bolu province of Turkey. Material and Method: Pulmonary function testing (PFT) was performed on 500 subjects above the age of 35 years who were selected randomly using 'Family Identification Cards' in each governor office in central Bolu. Of the 500 subjects, 285 (57.0%) were male. The diagnostic criteria of Global Initiative for Chronic Obstructive Lung Disease (GOLD) with spirometry was used to diagnose COPD. Results: The prevalence of COPD was found to be 8.6% (43 of 500 subjects). None of the diagnosed subjects had stage 1 disease in terms of GOLD stage definition. Stage 2, stage 3, and stage 4 diseases were found in 34.9%, 41.8%, and 23.3% of COPD-diagnosed subjects, respectively. Smoking history was positive in 42 of 43 subjects with COPD (97.7%). In terms of all subjects, COPD was diagnosed in 9.8% of males (28 of 285) and 6.9% of females (15 of 215). Discussion: COPD was defined as a significant public health problem in Bolu province of Turkey.

Keywords

Chronic Obstructive Pulmonary Disease; Prevalence; Smoking

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Introduction

Chronic obstructive pulmonary disease (COPD) is a preventable and treatable disease that is characterized by almost irreversible airflow restriction in the lungs. Air flow restriction is generally progressive and caused by an abnormal inflammatory response in the lungs due to the harmful particles and gasses. Tobacco use is accepted as one of the most significant risk factors. Although COPD is a lung disease, it may cause serious systemic problems [1]. In Turkey, the number of people with COPD is estimated to be around 2-3 million. A high frequency of smoking, inadequate spirometry means in the primary health care units, and other shortcomings in the prevention and diagnosis of the disease cause COPD to be one of the significant public health problems in Turkey [2-5]. This study aimed to explore the prevalence of COPD in Bolu province of Turkey.

Materials and Method

This study was designed as a cross-sectional study and the study design was approved by the local ethics committee. The study included 500 subjects above the age of 35 years who were selected randomly by using the Family Identification Cards in the local governor offices in Bolu province of Turkey. There are 37 districts in central Bolu and each has a local governor. The data were collected between May 2007-July 2007. A face-to-face interview was performed with each selected subject and a questionnaire form was filled out. In addition, spirometry testing, age, height, and weight of the subjects were recorded in the outpatient clinic of the Department of Chest Diseases in Bolu Izzet Baysal University. At least 3 spirometry recordings were performed and the best results were included. The diagnosis of COPD was made by using the diagnostic criteria of Global Initiative for Chronic Obstructive Lung Disease (GOLD) [1,6,7].

The collected data and the spirometry results were analyzed by using the SPSS 10.0 Statistical Package Program for Windows (SPSS Inc., Chicago, Illinois, USA). Values were expressed as mean±standard deviation. The normality of the values was analyzed by using the Shapiro-Wilk test. Independent samples t-test or Mann-Whitney U test were used according to the Shapiro-Wilk test result. Categorical comparisons were performed by chi-square test. Differences were considered significant at $p < 0.05$.

Results

The study comprised 500 subjects (285 male, 215 female). The age, height, and weight of male and female subjects are shown in Table 1.

The frequency of the symptoms did not differ between male and female subjects (Table 2).

Table 3 shows the smoking-related history and occupational exposure to dust and biomass with respect to gender in COPD patients. The subjects who never smoked and had at least one smoking family member were classified as passive-smoker.

The most frequent stage of COPD was stage 3 (severe COPD) (Table 4).

Table 1. Age, height, and gender characteristics of male and female subjects

	Male (n=285, 57%)		Female (n=215, 43%) (%43)		Total (n=500)	
	Min-Max[max]	Mean	Min-Max[max]	Mean	Min-Max[max]	Mean
Age (years)	35-87	63.9±15.9	35-79	52.4±14.3	35-87	58.2±15.3
Height (cm)	163-192	169.4±8.9	141-174	155.1±7.3	141-192	165.3±8.2
Weight (kg)	51-105	71.4±13.9	41-104	69.7±13.6	41-105	70.9±13.7

Min-Max: Minimum-Maximum

Table 2. The diagnostic, obstructive, and symptom characteristics of patients with COPD.

	Female (n=15)	Male (n=28)	Total (n=43)
COPD prevalence	6.9% (15/285)	9.8% (28/215)	8.6% (43/500)
Previous diagnosis of COPD	0.03% (1/285)	1.0% (5/215)	1.2% (6/500)
Cough	86.6% (13/15)	100.0% (28/28)	95.3% (41/43)
Sputum	80.0% (12/15)	96.4% (27/28)	90.7% (39/43)
Wheezing attacks	73.3% (11/15)	57.1% (16/28)	62.8% (27/43)
Dyspnea	86.6% (13/15)	89.2% (25/28)	88.3% (38/43)

COPD. Chronic obstructive pulmonary disease

Table 3. The frequencies of smoking-related history and occupational exposure in male and female subjects with COPD

	Male (n=28)		Female (n=15)		Total (n=43)	
	n	Percentile	n	Percentile	n	Percentile
Smoker	23	82.1	12	80	35	81.4
Smoked in the past	5	17.9	2	13.3	7	16.3
Never smoked	0	0	1	6.7	1	2.3
Smoking history	28	100	14	93.3	42	97.7
Passive smoker	0	0	1	0.06	1	2.3
Occupational exposure to dust	12	42.9	3	20	15	34.9
Biomass exposure	4	14.3	6	40	10	23.3

COPD. Chronic obstructive pulmonary disease

Table 4. The distribution of COPD subjects, using GOLD staging

Stages of COPD	n	Percentile (%)
Stage 1 (Mild COPD)	0	0
Stage 2 (Moderate COPD)	15	34.9
Stage 3 (Severe COPD)	18	41.9
Stage 4 (Very Severe COPD)	10	23.3
Total	43	100.0

COPD. Chronic obstructive pulmonary disease

Discussion

This study found the COPD prevalence in the population over 35 years of age in Bolu province of Turkey as 8.6%. The prevalences of COPD in male and female subjects were 9.8% and 6.9%, respectively.

Two important problems arise in studies investigating the epidemiology of COPD. The first is the selection of the study population and the second problem is possible sampling errors. This causes difficulty in comparing the results of different studies and also the evaluation of the progress of the disease.

In this study, we selected the subjects in a randomized way by using the cluster and systematic sampling from the Fam-

ily Identification Cards in order to minimize the sampling errors. The spirometric evaluation criteria used in this study is the widely accepted GOLD criteria [1].

In their large study including 14223 participants, Prescott et al. found that COPD has a three times higher prevalence in people with low socioeconomic status [8]. Respiratory symptom prevalence in the population over 40 years of age was investigated in the IPERBOC study in Spain [9]. Cough, sputum, and dyspnea prevalences were found as 13.5%, 10.7%, and 10.4%, respectively. The prevalence of chronic bronchitis was higher in the male population (8.3% in males and 1.4% in females). In our study, cough, sputum, and dyspnea prevalences were found as 39.6%, 30.2%, and 27.8%, respectively. The higher prevalences in our study compared to IPERBOC study may have originated from the higher prevalence of smoking-related history and higher occupational exposure.

Ozlu et al. investigated the prevalence of COPD in the population above 30 years of age in the Trabzon province of Turkey in 2004 [10]. That study is one of the pioneer studies using the criteria suggested by GOLD and ATS. A total of 613 subjects were included and a face-to-face interview and spirometry testing were performed. COPD prevalence according to GOLD criteria in their study was found as 0.98%. The prevalences in male and females were 1.7% and 0.3%, respectively. According to ATS criteria, overall prevalence, prevalences in male and in female populations were 2.8%, 4.1%, and 1.6%, respectively. COPD prevalences found by Ozlu et al. are significantly lower than in our study.

Ekici et al. compared the biomass-exposed and -nonexposed female populations above 40 years old [11]. All the subjects were nonsmokers. The prevalence of airflow obstruction (FEV_1/FVC<%70) in biomass-exposed females was 13.6%, a ratio lower than 28.5% in nonexposed females.

Some risk factors such as tobacco use, occupational dust exposure, air pollution, and biomass exposure may cause COPD [1]. The cause of the high prevalence of COPD in Bolu province of Turkey is possibly because of the high prevalence of smoking (57.6%) and occupational biomass exposure.

The most significant risk factor for COPD is smoking [12]. Smoking is responsible for 90% of COPD in industrialized countries [6]. According to the PIAR investigation report in 1998 in Turkey, 62.8% of males and 24.3% of females are smokers [13]. The prevalence of smoking in Bolu province (57.6%) is above the average for Turkey (43.0%) [13]. In this study, the high prevalence of severe COPD and continuing use of tobacco suggests the inconvenience in Turkey for patients in obtaining treatment and follow-up. These data show inadequate public health campaigns against smoking. This necessitates taking the required precautions.

Recent studies show that the prevalence of COPD in women is approaching the prevalence in men [14]. This is caused by increasing prevalence of smoking in women in recent years [6,15-17]. Similar prevalences of smoking and occupational exposure between men and women in the Bolu province support this suggestion. In our study, 14.8% of males and 40.0% of females with COPD had biomass exposure. This shows that biomass exposure may also be a more significant risk factor than anticipated.

COPD prevalence increases throughout the world. The mortality of COPD varies significantly between countries [6,18]. The reason for this difference is possibly because of the differences in smoking behaviors, environmental and genetic factors, and infections.

As in other areas of the world, the actual prevalence of COPD in Turkey is thought to be higher than reports indicate [3-5]. In Turkey, the high prevalence of smoking, inadequate spirometry, and inadequate health care in the diagnosis and follow-up of the disease in the primary health care units result in COPD being a significant public health problem in Turkey.

The epidemiologic data is important in controlling COPD, a preventable disease that causes social and economic problems. We think that the prevalence data related to Bolu province may enlighten future studies in Turkey. In conclusion, according to GOLD criteria, the prevalence of COPD in central Bolu province is 8.6%. The prevalences in males and females are 9.8% and 6.9%, respectively. The prevalence of smoking in subjects with COPD was 97.7%. The prevalence of COPD for passive smokers and those with occupational and biomass exposures were 2.3%, 34.8%, and 23.3%, respectively. The prevalence of small airway obstruction was 43.4%. Smoking is the most significant risk factor for both males and females. Other risk factors are passive smoking, biomass exposure, and occupational exposure. Most of the subjects (41.9%) with COPD had severe disease in terms of the GOLD criteria. Preventive measures should be taken for this prevalent public health problem.

Human Rights Statement: All procedures performed in this study involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards

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Competing interests

The authors declare that they have no competing interests.

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