RELATION OF BODY MASS INDEX AND DURATION OF CHRONIC OBSTRUCTIVE PULMONARY DISEASES IN SULAIMANI TEACHING HOSPITALS

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ABSTRACT

Background

Chronic obstructive pulmonary disease is a gradually developing illness including the pulmonary parenchyma or airways (or both) causing airflow obstruction. It is a progressive disease with various substantial extrapulmonary findings that may add suffering to the patients.

Objectives

This study aims to find out the relation of Body Mass Index and duration of Chronic Obstructive Pulmonary Disease in Sulaimani Teaching Hospitals.

Patients and Methods

A cross sectional study, one hundred patients who were previously diagnosed with chronic obstructive pulmonary disease participated in the study. The study was carried out during eight months (from 1st August 2018 to 1st March 2019) in Shahid Hemin and Shar Teaching Hospitals. The details of socio-demographic and clinical features with Body Mass Index and duration were analyzed. The questionnaire was filled out by direct interview. Data analyzed was performed using SPSS software version 22.0 and P-value less than 0.05 considered as significant.

Results

The mean age was 60.14±13.1 years, 68% of them were male. Smoking was present in most cases. The majority of cases were obese (36%). There was a significant relationship between the duration of chronic obstructive pulmonary disease and body mass index (P-value =0.008).

Conclusion

Conclusions: There is a significant relationship between the duration of COPD and BMI. There is a significant relationship between age and duration of COPD. There is a positive relationship between smoking and duration of COPD.

Keywords: *COPD; BMI, Sulaimani, Shar Teaching Hospital.*

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INTRODUCTION

Chronic Obstructive Pulmonary Disease (COPD) is a progressive lung illness. Patients with COPD suffer to breathe, which can cause dyspnea and/ or tiredness. At the beginning of the condition, the patients develop dyspnea during exercise [1]. COPD is caused by a mixture of small airway disease (obstructive bronchitis) and parenchymal destruction (emphysema) the relative contribution varies from person to person. This alteration does not develop all together, instead it progresses at dissimilar rates over time [2] . Emphysema is a pathological condition that defines structural changes. These changes include irregular and perpetual expansion of the airspaces distal to the terminal bronchioles that are accompanied by damaging the airspace walls, without fibrosis. The absence of fibrosis is a crucial feature to differentiate from interstitial pneumonia [3]. Emphysema, as a part of COPD, is a disease that affects a huge number of people. In 2016, the international Burden of Disease Study reported an occurrence of 251 million cases of COPD worldwide. Approximately, 90% of COPD deaths occur in middle- and low-income countries. [4] Chronic bronchitis (CB) can be defined as a chronic productive cough for above 3 months occurring within a length of 2 years. There is a strong causal relationship with smoking and it is often secondary to chronic obstructive pulmonary disease (COPD) [5]. CB is the result of hyper-secretion of mucus, which causes worsening airflow block by obstruction of small airways, alteration of airway surface tension predisposing to collapse, and epithelial remodeling. [6].

Causes: In developed countries like the United States, the single biggest cause of COPD is cigarette smoking. About 90 percent of people who have COPD are smokers or ex-smokers. Twenty to 30 percent of the smokers develop COPD. Most people with COPD are at least in the third decade of age. In addition to cigarette smoking, cigar, pipe, and second hand smoking can cause COPD. Up to 5 percent of COPD patients have a deficiency in a protein called alpha-1-antitrypsin. [7] There are many factors causeing COPD. Ecological and heredity factors play a role. For instance, serious exposure to certain dust at duty, chemicals, and indoor or outdoor air pollution can contribute to COPD. Genetic factors play a role in who develops COPD. [1] Symptoms of COPD are cough, dyspnea, sputum production, and/ or recurrent lower respiratory infections. [8] Symptoms such as coughing and breathlessness appear slowly; they progress and eventually lead to exercise limitation and death [9].

MATERIAL AND METHODS

Study design and setting

A quantitative descriptive cross-sectional, multicenter study was conducted to find out the relation of body mass index and duration of COPD. The data were collected prospectively from 1 st August 2018 to 1 st March 2019 in Shahid Hemin and Shar Teaching Hospitals in Sulaimani City. The patients were consecutive. The council of the College of Nursing accepted the protocol of the study and it was approved by the ethical committee in the College of Nursing-University of Sulaimani. Accordingly, an official letter from the College of the Nursing/ University of Sulaimani to the Shahid Hemn and Shar teaching hospitals in Sulaimani city was referred to provide cooperation during data collection. All patients included in this study had the previous diagnosis of COPD. A non-probability, sample size of 100 patients were chosen from Shahid Hemin and Shar Teaching Hospitals.

Inclusion criteria

All COPD patients attending hospitals, age between 18-80, able to give consent for participation and clinically stable Patient.

Exclusion criteria

Patients younger than 18 and older 80 years of age, not able to give verbal consent.

The study instrument

The study questionnaire consisted of two parts, as the followings:

Part one

Patients' socio-demographic information that includes age, gender, occupation, residential area, level of education, and smoking.

Part two

Clinical data including duration of COPD in addition to BMI measurement. Also, it includes information about BMI measurement, height, and weight BMI Grading as per WHO [10,11] :

Underweight	<18.5
Normal	18.5-24.9
Overweight	25-30
Obese	>30

TThe validity of the questionnaire

Validity is a determination of the extent to which the tool reproduces the abstract concept being inspected. The face validity of this study questionnaire was established through a panel of (5) experts of different specialties including (Nursing, Surgery, Medicine). These experts were asked to investigate the questionnaire for relevance and adequacy to get the present study objectives. The vast majority of experts indicated that small changes should be done. The questionnaire was suitably considered as a valid one after their important suggestions were taken into consideration.

Data collection methods

Before conducting the study, verbal consent was taken. A direct interview for each patient was performed.

Statistical analysis

The data were analyzed with the Statistical Package for the Social Sciences (SPSS) version (22.0). Different statistical tests were used to achieve the aim of the study. Descriptive statistics were used, initially with exploratory data analysis, Such as participants; socio-demographic characteristics, lifestyle, and. biomedical factors. Also, the primary outcome of the study was shown in (frequency, percentage, mean, standard deviation, minimum, maximum, and range). Analytical statistics were used to establish the association between the variables of interest. categorical variables were compared by the chi-square test, and numerical variables by T-test.

RESULTS

The study included 100 patients, most of them were male (68%), (54%) of cases were >60 years old. The most prevalent occupation was employee (48%), Table 1.

In the study (82%) of cases were smokers (ex-smoker 37%, current 45 %). COPD Duration was categorized to <1 year, 1-3 years, 4-5 years, >5 years) and the sample size distributed as (22%, 17%, 27%, 34%) respectively. Table (1) shows that obese participants were (36%), overweight and underweight were (34%, 4%) respectively. There is no significant relationship between socio demographic characteristics and BMI. Most of the obese participants were over the age of 60, male, employee, and ex-smoker Table 2.

Table 3 shows a positive relationship between the age and duration of COPD (P-value 0.049). The patient's age above 60 years old has a duration of more than 5 years. Otherwise, duration has no relation to sex, residency, occupation, and education. Duration has a positive relationship with smoking (P-value 0.003) most common cases were current smoker between duration 4-5 years, Table 3.

There is a positive relationship found between BMI and duration of COPD (P-value 0.008), it means that the more body weight the longer the duration of COPD, Table 4.

Table 1. Socio-demographic and clinical characteristics of the participants.

Variable's	N (%)
Age (years)	
18-40	10(10)
41-60	36(36)
>60	54(54)
Sex	
Female	32(32)
Male	68(68)
Residency	
Rural	45(45)
Urban	55(55)
Occupation	
Framer	11(11)
Employ	48(48)
Retired	9(9)
Housewife	20(20)
Jobless	12(12)
Education	
Illiterate	35(35)
Primary	24(24)
Secondary	15(15)
College	26(26)
Smoking	
Current smoker	45(45)
Ex-smoker	37(37)
Passive	6(6)
Social	1(1)
Never	11(11)
Pak/year	
<20	9(11)
20-40	39(47.5)
>40	34(41.5)
Duration (year)	
<1	22(22)
1-3	17(17)
4-5	27(27)
>5	34(34)
BMI	
<18.5	4(4)
18.5-24.9	26(26)
25-30	34(34)
>30	36(36)

Table 2. Distribution of the patients' body mass index according to the socio-demographic characteristics.

	BMI , N (%)				
Variable's	**<18.5**	**18.5-24.9**	**25-30**	**>30**	**P.Value**
Age					
18-40	0(0)	3(11.5)	2(5.9)	5(13.9)	0.810
41-60	2(50)	10(38.5)	14(41.2)	10(27.8)	
>60	2(50)	13(50)	18(52.9)	21(58.3)	
Sex					
Female	2(50)	9(34.6)	8(23.5)	13(36.1)	0.556
Male	2(50)	17(65.4)	26(76.5)	23(63.9)	
Residency					
Rural	2(50)	8(30.8)	18(52.9)	17(47.2)	0.376
Urban	2(50)	18(69.2)	16(47.1)	19(52.8)	
Occupation					
Framer	0(0)	3(11.5)	4(11.8)	4(11.1)	0.935
Employ	3(75)	14(53.8)	16(47.1)	15(41.7)	
Retired	0(0)	2(7.7)	3(8.8)	4(11.1)	
Housewife	0(0)	4(15.4)	6(17.6)	10(27.8)	
Jobless	1(25)	3(11.5)	5(14.7)	3(8.3)	
Education					
Illiterate	2(50)	7(26.9)	11(32.4)	15(41.7)	0.755
Primary	0(0)	6(23.1)	12(35.3)	6(16.7)	
Secondary	1(25)	4(15.4)	3(8.8)	7(19.4)	
College	1(25)	9(34.6)	8(23.5)	8(22.2)	
Smoking					
Current smoker	2(50)	13(50)	17(50)	13(36.1)	0.748
Ex-smoker	2(50)	10(38.5)	9(26.5)	16(44.4)	
Passive	0(0)	1(3.8)	4(11.8)	1(2.8)	
Social	0(0)	0(0)	0(0)	1(2.8)	
Never	0(0)	2(7.7)	4(11.8)	5(13.9)	

Table 3. Distribution of the duration of COPD according to the socio-demographic characteristics.

	Duration , N (%)				
Variable's	**<1**	**1-3**	**4-5**	**>5**	**P.Value**
Age					
18-40	5(22.7)	2(11.8)	2(7.4)	1(2.9)	0.049
41-60	10(45.5)	5(35.3)	12(44.4)	8(23.5)	
>60	7(31.8)	9(52.9)	13(48.1)	25(73.5)	
Sex					
Male	15(68.2)	11(64.7)	20(74.1)	22(64.7)	0.870
Female	7(31.8)	6(35.3)	7(25.9)	12(34.3)	
Residency					
Rural	7(31.8)	9(52.9)	11(40.7)	18(52.9)	0.358
Urban	15(68.2)	8(41.7)	16(59.3)	16(47.1)	
Occupation					
Framer	1(4.5)	1(5.9)	4(14.8)	5(14.7)	0.100
employee	14(63.6)	7(41.2)	17(63)	10(29.4)	
Retired	0(0)	1(5.9)	2(7.4)	6(17.6)	
Housewife	4(18.2)	4(23.5)	2(7.4)	10(29.4)	
Jobless	3(13.6)	4(23.5)	2(7.4)	3(8.8)	
Education					
Illiterate	4(18.2)	5(29.4)	8(29.6)	18(52.9)	0.235
Primary	5(22.7)	5(29.4)	7(25.9)	7(20.6)	
Secondary	4(18.2)	2(11.8)	5(18.5)	4(11.8)	
College	9(40.9)	5(29.4)	7(25.9)	5(14.7)	
Smoking					
Current smoker	4(34.6)	4(23.5)	18(66.7)	15(44.1)	0.003
Ex-smoker	4(18.2)	8(47.1)	8(29.6)	17(50)	
Passive	2(9.1)	2(11.8)	1(3.7)	1(2.9)	
Social	1(4.5)	0(0)	0(0)	0(0)	
Never	7(31.8)	3(17.6)	0(0)	1(2.9)	

Table 4. Distribution of the patients' body mass index according to the duration of the disease.

	Duration of COPD (year), N (%)				
BMI	**<1**	**1-3**	**4-5**	**>5**	**P.value**
<18.5	0(0)	1(5.9)	3(11.1)	0(0)	0.008
18.5-24.9	6(27.3)	3(17.6)	12(44.4)	5(14.7)	
25-30	10(45.4)	8(41.7)	7(25.9)	9(26.5)	
>30	6(27.3)	5(29.4)	5(18.5)	20(58.8)	

DISCUSSION

In this study, the mean age of the patients was 60.14± 13.11, this is similar to the findings of the other studies (the mean age of the population was 66%)[12]. In a study conducted in Turkey, the mean age of the study population was 67.76 Years [13]. In the current study, we found that the majority of the participants were male (68%). Smoking habits are variable among different cultures. A study done in India, the majority of participants were males 139 (93.3%) [14] and a study in Turkey showed a similar result, 43 (96%) was male. [13]. In another study conducted in china , most of the cases were female (58.8%) [15]. In our study, we found that the majority of the sample from an urban area (55%), this is similar to another study conducted in the United States (70.1% from urban region) [16]. Also in a different study done in Texas, more than half of the cases were from the rural areas (50.7) [17]. In the present study, the most common job was an employee (48%). compared to another study conducted in Sweden, the majority of the sample size were employee (69%) [18].

In our study, the majority of the participants were smokers (82%) (Current 45%, and ex-smoker 37%), this contradicts the previous study that was done in the United Kingdom, (ex-smoker, 53% or current smoker, 37%) [19]. Similar to our study, a study in Russian found that most of the cases were current smokers (71.4%) and ex-smoker (9.5%) [20].

Regarding pack per year of smoking, the age of the majority of cases (47.5%) were between 20-40 years. This is similar to other study, in which pack per year categorized to <35 and >35 pack per year corresponding to 50.3%, 49.7%, respectively [14]. Another study conducted in Russian, categorized packs per year to < 20 years and 20 or more found 33.3%, 47.7% respectively [20]. Opposite of our result, a study in China, showed a higher percentage of pack per year in <15pack yrs (75.4%) [15]. The current study established that (36%) of the patients have BMI >30kg/m2. This is similar to an earlier study in the United States which showed an equal result, 39.8% of adults had BMI ≥ 30 kg/m^2 [21]. Also, a study done in Greece, found that 42% of patients were overweight or obese [22].

While in a different study in Korea, the majority of the cases had normal body weight 300 (64.0%) [23]. This reflects that 1/3 of our population have a heaviness problem and could be due to intake habits and neglecting exercise. In the present study, a positive relationship was found between the duration of COPD and BMI; it means that extra body weight linked with a longer duration of COPD. About 58.8% of the participants were obese and had COPD for more than five years. This is compared with the previous study done in Korea, in which duration after being diagnosed with COPD and physical activities were positively related to the BODE index [24]. Another study that was conducted in Turkey, Correlations between BODE score and disease duration was positive (p =0.011) [25]. In the present study, we found a significant relationship between the duration of chronic obstructive pulmonary diseases and the age of the participants (p =0.49). In the current study, there was a significant association between smoking and the duration of chronic obstructive pulmonary disease (p = 0.003). In the previous study in United States America, found Smoking duration had a linear relationship with COPD (P=0.001) [26] .

There are several limitations to the study. These include the shortage time of the study, patient refusal to participate in the study, unavailability of the spirometer, and shortage of the staff. In conclusion; the majority of our cases were male, more than 60 years old, and smokers. Most of the cases were obese.

There is a significant relationship between the duration of COPD and BMI. There is a significant relationship between age and duration of COPD. There is a positive relationship between smoking and duration of COPD.

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