



Multivariate Analysis of Some Clinical Parameters by Gender and Age in Patients with COPD for the First Time Diagnosed

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Abstract

Aim: In this study, it was aimed to analyze the different clinical parameters according to gender and age for the first time in patients diagnosed with COPD. **Methods:** The study was designed retrospectively. Patients who were admitted to Kadikoy Medica Hospital between 12.10.2017 and 12.10.2018 with respiratory complaints and COPD diagnosed for the first time were included in the study. A total of 160 patients with the diagnosis of COPD for the first time among 845 patients were included in the study. Age, gender, urea, creatinine, CRP, NEU, WBC, EOS and HGB values were obtained from the patient files. **Findings:** Clinical parameters of CRP, urea, creatinine, WBC, NEU and HGB were higher in male patients and EOS was higher in female patients. According to the results of the difference analysis, only HGB levels were statistically different between the groups ($p < 0.05$). According to uncontrolled gender correlation analysis in patients with COPD for the first time, CRP ($r = 0.224$; $p < 0.01$), urea ($r = 0.580$; $p < 0.01$), creatinine ($r = 0.331$; $p < 0.01$), creatinine ($r = 0.331$; $p < 0.01$), EOS ($r = -0.172$; $p < 0.05$) and HGB ($r = -0.319$; $p < 0.01$) level correlations with age were statistically significant. There was a positive correlation between CRP, urea and creatinine and age, and there was a negative correlation between EOS and HGB and age. Age and urea ($r = 0.573$; $p < 0.01$) and creatinine ($r = 0.426$; $p < 0.01$) were statistically significant and positively correlated in women with firstly diagnosed COPD. Correlations between age and other research parameters were not statistically significant ($p > 0.05$). CRP ($r = 0.300$; $p < 0.01$), urea ($r = 0.565$; $p < 0.01$), creatinine ($r = 0.295$; $p < 0.05$), creatinine ($r = 0.295$; $p < 0.05$), EOS ($r = -0.225$; $p < 0.05$) and HGB ($r = -0.372$; $p < 0.01$) were significantly correlated in male patients who firstly diagnosed with COPD. The direction of the correlation was positive for CRP, urea and creatinine, and negative for EOS and HGB parameters. **Conclusion:** The results of the study show that age and urea and creatinine levels of the women with COPD diagnosis for the first time have changed according to age. In males, CRP, urea, creatinine, EOS and HGB values change according to age. Therefore, it is useful to study gender and age-related mechanisms in COPD.

Keywords: COPD, gender, age, urea, creatinine, CRP, blood count.

Introduction

Chronic Obstructive Pulmonary Disease (COPD), a common disease of pulmonary medicine, is known by aspiration of gastric juice during respiration as well as physical symptoms and debilitating progression.^[1,2,3] National Institute of Health (NIH) reported the disease as a leading cause of mortality in the United States.^[4] COPD has a debilitating and slow progression with physical symptoms.^[5] COPD causes airflow restriction and changes in lung, and for this reason, it is associated with comorbidities and systemic effects.^[6,7,8]

The management of COPD is mainly depend on progression inhibiting strategy.^[9,10,11,12] Since treatment methods are restricted, prevention of COPD is as important as treatment. For this reason, risk factors of the COPD must be well understood. In this study, it was aimed to analyze the different clinical parameters

according to gender and age for the first time in patients diagnosed with COPD.

Methods

The study was designed retrospectively. Patients who were admitted to Kadikoy Medica Hospital between 12.10.2017 and 12.10.2018 with respiratory complaints and COPD diagnosed for the first time were included in the study. A total of 160 patients with the diagnosis of COPD for the first time among 845 patients were included in the study. The inclusion criteria were as follows:

- With any respiratory complaints,
- For the first time diagnosed with COPD,
- No long-term drug use which may affect steroid and similar research data,
- Clinically without heavy table.

Age, gender, urea, creatinine, CRP, NEU, WBC, EOS and HGB values were obtained from the patient files. Data were taken from the last follow-up of blood samples with urea and creatinine tests.

In the analysis of the research data, Kolmogorov Smirnov test was performed for the distribution of the measurement data. At the end of the test, Independent Samples T-Test was applied for the difference between the normal distribution age, WBC and HGB data. Mann-Whitney-U test was applied for the parameters that did not comply with normal distribution (CRP, urea, creatinine, NEU and EOS). Spearman's rho correlation analysis was used for correlated and uncontrolled analyzes with partial correlation method. All analyzes were analyzed with SPSS 17.0 for Windows and 0.05 significance level.

Results

The mean age of the subjects included in the study and the distribution of some clinical parameters are given in Table 1.

Table 1: Baseline characteristics of patients and differences based on gender

Parameter, Mean±SD	Female (n=73)	Male (n=87)	P
Age	70.33±14.54	67.88±12.60	0.257 ^a
CRP	1.57±2.59	1.81±3.53	0.376 ^b
Urea	46.33±27.15	46.45±33.18	0.211 ^b
Creatine	0.84±0.32	0.92±0.41	0.055 ^b
WBC	8.59±3.07	8.73±3.56	0.800 ^a
NEU	5.84±2.86	6.06±3.45	0.956 ^b
EOS	0.20±0.21	0.20±0.20	0.833 ^b
HGB	12.94±1.63	13.97±2.06	0.001^a

a. Independent Samples T-Test, b. Mann Whitney-U test.

The mean age of women (70.33 ± 14.54) who were first diagnosed with COPD was greater than the mean age of men (67.88 ± 12.60). However, according to the results of the difference analysis, these differences between the average age of female and male patients were not statistically significant (p > 0.05). Clinical parameters of CRP, urea, creatinine, WBC, NEU and HGB were higher in male patients and EOS was higher in female patients. According to the results of the difference analysis, only HGB levels were statistically different between the groups (p < 0.05). The difference between the other parameters was not statistically significant (p > 0.05). The results of gender controlled and g uncontrolled Spearman's rho correlation analysis between age and clinical parameters are presented in Table 2.

Table 2: Gender controlled and uncontrolled correlation results between age and parameters

Age	Uncontrolled		Controlled	
	r	P	r	P
CRP	0.224	0.007	0.260	0.006
Urea	0.580	0.000	0.417	0.000
Creatine	0.331	0.000	0.328	0.000
WBC	0.017	0.832	0.188	0.048
NEU	0.107	0.179	0.230	0.015
Eos	-0.172	0.030	0.023	0.813
HGB	-0.319	0.000	-0.323	0.001

According to gender uncontrolled correlation analysis in patients with COPD for the first time, CRP (r = 0.224; p < 0.01), urea (r = 0.580; p < 0.01), creatinine (r = 0.331; p < 0.01), creatinine (r =

0.331; p < 0.01), EOS (r = -0.172; p < 0.05) and HGB (r = -0.319; p < 0.01) level correlations with age were statistically significant. There was a positive correlation between CRP, urea and creatinine and age, and there was a negative correlation between EOS and HGB and age.

According to gender controlled gender correlation analysis in patients with COPD for the first time, CRP (r = 0.260; p < 0.01), urea (r = 0.417; p < 0.01), creatinine (r = 0.328; p < 0.01), WBC (r=0.188; p<0.05), NEU (r=0.230; p<0.05), and HGB (r=-0.323; p<0.01) level correlations with age were statistically significant. There was a positive relationship between CRP, urea, creatinine, WBC and NEU, and there was a negative correlation between HGB and age. The results of the Spearman's rho correlation analysis for the relationship between age and clinical parameters based on gender groups were given in Table 3.

Table 3: Correlation results between age and parameters based on gender

	Female (n=73)		Male (n=87)	
	R	p	r	p
CRP	0.137	0.263	0.300	0.009
Urea	0.573	0.000	0.565	0.000
Creatine	0.426	0.001	0.295	0.010
WBC	-0.008	0.950	0.040	0.716
NEU	0.078	0.514	0.144	0.182
EOS	-0.106	0.373	-0.225	0.037
HGB	-0.215	0.068	-0.372	0.000

Age and urea (r = 0.573; p < 0.01) and creatinine (r = 0.426; p < 0.01) were statistically significant and positively correlated in women with firstly diagnosed COPD. Correlations between age and other research parameters were not statistically significant (p > 0.05).

CRP (r = 0.300; p < 0.01), urea (r = 0.565; p < 0.01), creatinine (r = 295; p < 0.05), creatinine (r = 295; p < 0.05), EOS (r = -0.225; p < 0.05) and HGB (r = -0.372; p < 0.01) were significantly correlated in male patients who firstly diagnosed with COPD. The direction of the correlation was positive for CRP, urea and creatinine, and negative for EOS and HGB parameters.

Discussion

In the literature, there are studies reporting that the prevalence of COPD is generally positively correlated with age and more common in men (12-15). In these studies, males are reported to have higher COPD susceptibility due to working conditions and environmental factors and smoking (16-19). On the other hand, there are studies reporting that biomass exposure, especially in rural areas, has a high prevalence of COPD in women (20-22). In our study, although only the difference of HGB parameter was found to be statistically significant, overall clinical picture was more severe in men than in women.

Although there are studies in the literature that examined gender, age and similar demographic characteristics for COPD patients (23-27), there is not enough study on the relationship between these variables in controlled manner. Correlation analysis revealed that there was a statistically significant relationship between CRP, urea, creatinine, EOS, and HGB in COPD patients. In the correlation analysis in which gender was controlled, all parameters except EOS were statistically significantly correlated with age. In other words, when the gender was taken into consideration, WBC and NEU parameters were also significantly correlated with age.

When the correlation analysis is done separately for women and men; While CRP, urea, creatinine, EOS and HGB age were statistically significantly correlated with age in males, there was a statistically significant correlation between age and urea and creatinine age in females.

Conclusion

Although there are studies investigating age and gender in patients with COPD, there are not enough studies in which these two variables are controlled. In addition, it can be stated that the mechanism of effect of age and gender has not been adequately examined in the literature.

The results of the study show that age and urea and creatinine levels of the women with COPD diagnosis for the first time have changed according to age. In males, CRP, urea, creatinine, EOS and HGB values change according to age. Therefore, it is useful to study gender and age-related mechanisms in COPD.

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