Microbes and Infectious Diseases

Original article

A retrospective study of demographic data, applied treatments and prognosis by gender in coronavirus infections

Ilhan Yildirim *[1], Selcuk Yaylaci [2], Sibel Hacer Sapmaz [3], Kubilay Işşsever [2], Deniz Cekic [2], Didar Senocak [4], Rumeysa Kurt [2]

1- Gorele Op.Dr.Ergun Ozdemir Devlet Hastanesi, Turkey.
2- Sakarya Universitesi Tip Fakultesi, Turkey.
3- Florance Nightingale Hospital, Turkey.
4- Haydarpaşa Numune Eğitim ve Araştırma Hastanesi, Turkey.

A B S T R A C T

Background: In December 2019, cases of pneumonia; coronavirus disease 2019 (COVID-19) due to a new coronavirus infection (SARS-COV-2) started to appear in Wuhan City, China. It quickly spread from China to the whole world. The objective of this study was to investigate the demographic data, applied treatments and outcomes of the patients with COVID-19 that we followed in our clinic according to their genders. **Methods:** In this study, we included a total of 96 patients whose clinical, radiological or laboratory parameters were compatible with COVID-19 and who were hospitalised, treated and followed-up in our Internal Medicine Clinic. The demographic data, treatments and prognostic data of these patients were retrospectively recorded and analysed in order to see if there were statistically significant differences between genders. **Results:** The average age of all COVID-19 cases included in our study was 63.54 ±15.8. The average age of male patients was 65.6 ±14.44 and the one of female patients was 61.82 ±17.1: no statistical significance was found. The number of smoking male patients was 16, and this value was found to be 3 in females, and it was statistically significantly higher in males (*p <0.05*). **Conclusion:** No significant recommandations was found between male and female patients based on their demographic data, symptoms, treatments and outcomes.

Introduction

In December 2019, pneumonia cases due to a new coronavirus infection began to appear in Wuhan, China. It spread rapidly in China and all over the world and a pandemic was declared by the World Health Organisation. In February 2020, the World Health Organisation defined this disease as COVID-19 disease, which means coronavirus disease 2019 [1].

Symptoms caused by COVID-19 vary clinically from mild to severe, and according to a study based on 44.500 patients reports and examined by the Chinese Center for Disease Control and Prevention, 81% of the patients had mild pneumonia. Depending on the severity of the symptoms, the remaining patients had a severe or critical form of the disease [2]. In other studies, critical and mortal outcomes rates were found to be higher in hospitalised patients [3]. The presence of various comorbidities in patients also causes a more severe course of the disease and increases the mortality rate. These comorbidities include cardiovascular disease, diabetes mellitus, hypertension, chronic obstructive pulmonary disease, asthma, cancer, chronic renal failure, and smoking [4-9].

To be able to evaluate the COVID-19, which concerns the whole world and whose outcome depends on many factors, we analysed retrospectively the demographic data, treatments and prognosis of

* *Corresponding author:* Ilhan Yildirim
E-mail address: driyldrm@gmail.com

the patients who were followed up in our Internal Medicine Clinic.

Material and methods

Patients

This single-centre, retrospective study was done in Sakarya University Internal Medicine Clinic and included a total of 96 patients who were hospitalised between 01.03.2020 and 31.05.2020 and who were clinically, radiologically or laboratory compatible with COVID-19. The informations about age, gender, smoking status and alcohol consumption, comorbid diseases and symptoms on admission were analysed retrospectively from the files of the patients followed in the service.

Statistical analysis

Descriptive analyses were conducted to give informations about the general characteristics of the study population. Numerical variables were expressed as measures of central tendency (mean ± standard deviation), and categorical variables as frequency distributions (number percent). Student's t test was used for parametric numerical variables, and Pearson chi-square test was used for categorical variables. $P < 0.05$ was considered statistically significant. IBM SPSS 23 program was used for statistical analysis.

Ethics statement

This study was approved by the Ethical Committee of the Faculty of Medicine of Sakarya University in Turkey.

Results

While the mean age of the patients included in our study was 63.54 ±15.8 years, this value was 65.6 ±14.44 years in male patients and 61.82 ±17.1 years in female patients, and there was no significant difference between both genders ($p=0.159$). The number of smoking male patients was 16 and this value was found to be 3 in females and it was statistically significant ($p < 0.05$). No difference was found between other chronic diseases and genders **(Table 1)**.

All examined records of the studied patients, the most common symptom was cough with a rate of 63.5%, followed by shortness of breath with a rate of 52.1% and fever with a rate of 41.7%. When the symptoms of male and female patients were compared, no statistical significant was found between the two groups **(Table 2)**.

While 54.2% (n: 52) of the patients included in our study needed intensive care, 45.8% (n: 44) of the patients did not need it. When the two genders were compared, no significant difference was found **(Table 3)**.

Of all patients included in the study, 72.9% (n:70) recovered and were discharged whereas 27.1% (n: 26) had a mortal outcome. When male and female patients were compared in terms of mortality, no significant difference was found **(Table 3)**.

Table 1. Demographic values and baseline characteristics of patients with COVID-19.

		Total number of patients(n:96)	Male (n:51)	Female (n:45)	*P-value*
Age ± SD years		63,54±15,8	65,6±14,44	61,82±17,1	*0,159*
Smoking	**yes ; n (%)**	19(19,8)	16(31,4)	3(6,7)	**0,002**
	no; n (%)	77(80)	35(68,6)	42(93,3)	
Alcohol	**yes; n (%)**	3(3,1)	3(5,9)	0(0)	*0,245*
	no; n (%)	93(96,9)	48(94,1)	45(100)	
DM	**yes; n (%)**	31(32,3)	12(23,5)	19(42,2)	*0,051*
	no; n (%)	65(67,7)	39(76,5)	26(57,8)	
HTN	**yes; n (%)**	47(49)	22(43,1)	25(55,6)	*0,225*
	no; n (%)	49(51)	29(56,9)	20(44,4)	

CAD	yes; n (%)	19(19,8)	13(25,5)	6(13,3)	0,136
	no; n (%)	77(80,2)	38(74,5)	39(86,7)	
CHF	yes; n (%)	9(9,4)	6(11,8)	3(6,7)	0,495
	no; n (%)	87(90,6)	45(88,2)	42(93,3)	
COPD	yes; n (%)	18(18,8)	12(23,5)	6(13,3)	0,202
	no; n (%)	78(81,3)	39(76,5)	39(86,7)	
Asthma	yes; n (%)	6(6,3)	4(7,8)	2(4,4)	0,681
	no; n (%)	90(93,8)	47(92,2)	43(95,6)	
CKD	yes; n (%)	6(6,3)	4(7,8)	2(4,4)	0,681
	no; n (%)	90(93,8)	47(92,2)	43(95,6)	

SD: standard deviation; DM: diabetes mellitus; HTN: hypertensive; CAD: coronary artery disease; CHF: chronic heart failure; COPD: chronic obstructive pulmonary disease; CKD: chronic kidney disease.

Table 2. Frequency distribution of COVID-19 symptoms among the studied patients by gender .

		Total number of patients (n:96)	Male (n:51)	Female (n:45)	*P-value*
Fever	yes; n (%)	40(41,7)	18(35,3)	22(48,9)	0,178
	no; n (%)	56(58,3)	33(64,7)	23(51,1)	
Cough	yes; n (%)	61(63,5)	32(62,7)	29(64,4)	0,863
	no; n (%)	35(36,5)	19(37,3)	16(35,6)	
Sputum	yes; n (%)	3(3,1)	2(3,9)	1(2,2)	0,633
	no; n (%)	93(96,9)	49(96,1)	44(97,8)	
Sore throat	yes; n (%)	7(7,3)	4(7,8)	3(6,7)	0,825
	no; n (%)	89(92,7)	47(92,2)	42(93,3)	
Dyspnea	yes; n (%)	50(52,1)	29(56,9)	21(46,7)	0,318
	no; n (%)	46(47,9)	22(43,1)	24(53,3)	
Headache	yes; n (%)	5(5,2)	2(3,9)	3(6,1)	0,663
	no; n (%)	91(94,8)	9(96,1)	42(93,3)	
Dıarrhea	yes; n (%)	5(5,2)	2(3,9)	3(6,7)	0,663
	no; n (%)	91(94,8)	49(96,1)	42(93,3)	
Anosmia	yes; n (%)	3(3,1)	0(0)	3(6,7)	0,99

Table 3. Percentage distribution of intensive care need & mortality among the studied COVID-19 patients by gender.

		Total number of patients (n:96)	Male (n:51)	Female (n:45)	*P-value*
ICU requirement	**needed; n (%)**	52(54,2)	30(58,8)	22(48,9)	*0,32*
	not needed; n (%)	44(45,8)	51 (41,2)	23(51,1)	
Mortality	**yes; n (%)**	26 (27,1)	16 (68,6)	10 (77,8)	*0,314*
	no; n (%)	70 (72,9)	35 (31,4)	35 (22,2)	

ICU: intensive care unit.

Discussion

The risk factors determined by CDC (Centers for Disease Control and Prevention) for COVID-19 are: elderly chronic lung disease, diabetes mellitus, severe heart disease, and chronic renal failure [10]. Smoking is also considered among the causes of the severity of the disease [11]. In a meta-analysis conducted in China and including 1527 patients, hypertension with 17.1% of the patients and diabetes mellitus with 9.7% of the patients were found to be the most common comorbid diseases [12]. Similarly, in our study, 49% of our patients were patients with hypertension and 32.3% with diabetes mellitus. However, while there was no significant difference in hypertension between genders in our study, diabetes mellitus was found to be significantly higher in female gender **(Table 1)**.

Smoking has a negative effect on the lungs and respiratory diseases [13]. Smoking also has negative effects on the immune system and increases the susceptibility to respiratory tract infections [14]. In a study conducted in China with 191 patients, it was shown that smoking is a risk factor in the progression of COVID-19 disease [15]. In our study, 19.8% of the patients with COVID-19 were smoking, while this rate was 31.4% in males, it was only 6.7% in females: smoking was found to be significantly higher in men **(Table 1)**. Even though there is no significant difference between male and female patients in term of intensive care need or mortality, the fact that the number of male patients who needed intensive care and who died is higher than women, supports the finding that smoking is a risk factor.

In the literature, the most common symptoms of COVID-19 infection are reported as cough, fever, and dyspnea [16]. The current study too, the most common symptoms in the patients were found to be cough, fever and dyspnea. More rarely, sputum, sore throat, anosmia, diarrhoea and headache were seen. In our study, no significant difference was found between the genders in term of symptoms at presentation.

According to the data of the World Health Organisation, the mortality rate in the whole world has been determined as 3.4% [17]. In medical literature, it is emphasised that COVID-19 infection causes worse outcomes and higher mortality in men than in women. It has been stated that its more severe course in men may be due to sex hormones [18]. When the patients included in our study were analysed, it was found that 54.2% (n:52) of the patients needed intensive care, and there was no significant difference between genders; the mortality rate was 27.1% (n: 26), and once more, no difference was found **(Table 3)**.

Limitation

The weak point of our study was the number of patients: we used a serie of 96 patients. In larger-scale studies, different results may be found in terms of significance.

Conclusion

According to the results of our local clinical study, no significant difference was found between gender, demographic data, symptoms on admission, applied treatments and prognosis. The small number of patients in this study is a disadvantage, and meaningful results can be obtained in a larger study.

Acknowledgment

Conflict of interest: none

Financial disclosure: none

References

1- **World Health Organization.** Director-General's remarks at the media briefing on 2019-nCoV on 11 February 2020. Available at: https://www.who.int/dg/speeches/detail/who director-general-s-remarks-at-the-media briefing on-2019-ncov-on-11-february-2020 [Accessed February, 2020].

2- **Wu Z, McGoogan JM.** Characteristics of and Important Lessons From the Coronavirus Disease 2019 (COVID-19) Outbreak in China: Summary of a Report of 72 314 Cases From the Chinese Center for Disease Control and Prevention. JAMA 2020; 323(13):1239-42.

3- **Richardson S, Hirsch JS, Narasimhan M, Crawford JM, McGinn T, Davidson KW, , et al.** Presenting Characteristics, Comorbidities, and Outcomes Among 5700 Patients Hospitalized With COVID-19 in the New York City Area. JAMA 2020; 323(20):2052-2059.

4- **Zhou F, Yu T, Du R, Fan G, Liu Y, Liu Z, et al.** Clinical course and risk factors for mortality of adult inpatients with COVID-19 in Wuhan, China: a retrospective cohort study. Lancet 2020; 395:1054.

5- **Liang W, Guan W, Chen R, Wang W, Li J, Xu K, et al.** Cancer patients in SARS-CoV-2 infection: a nationwide analysis in China. Lancet Oncol 2020; 21(3):335-7.

6- **CDC COVID-19 Response Team.** Preliminary Estimates of the Prevalence of Selected Underlying Health Conditions Among Patients with Coronavirus Disease 2019 — United States, February 12–March 28, 2020. MMWR Morb Mortal Wkly Rep 2020. Available at: https://www.cdc.gov/mmwr/volumes/69/wr/mm 6913e2.htm.

7- **Lighter J, Phillips M, Hochman S, Sterling S, Johnson D, Francois F, et al.** Obesity in patients younger than 60 years is a risk factor for Covid-19 hospital admission. Clin Infect Dis 2020; 71(15): 896–897.

8- **Mehra MR, Desai SS, Kuy S, Henry TD, Patel AN.** Cardiovascular Disease, Drug Therapy, and Mortality in Covid-19. N Engl J Med 2020; 382:e102.

9- **Dai MY, Liu DB, Liu M, Zhou FX, Li GL, Chen Z, et al.** Patients with cancer appear more vulnerable to SARS-COV-2: a multi-center study during the COVID-19 outbreak. Cancer Discov 2020; 80(16 Suppl): CT406.

10- **Timeline.** How the coronavirus spread in Spain (2020) Erişim adresi: Available at: https://www.yenisafak.com/en/world /timeline-how-the-coronavirusspread-in-spain-3515690 (Erişim Tarihi 18.04.2020).

11- **Glants SA.** Reduce your risk of serious lung disease caused by corona virus by quitting smoking and vaping [Internet] Available at: https://tobacco.ucsf.edu/reduce-your-risk serious-lung-disease-caused-corona-virus quitting-smoking-and-vaping Erişim:14.3.2020.

12- **Li B, Yang J, Zhao F, Zhi L, Wang X, Liu L.** Prevalence and impact of cardiovascular metabolic diseases on COVID-19 in China. Clin Res Cardiol 2020; 109(5):531-8.

13- **Tonnesen P, Marott JL, Nordestgaard B, Bojesen SE, Lange P.** Secular trends in smoking in relation to prevalent and incident smoking-related disease: A prospective population-based study. Tob Induc Dis 2019; 17: 72

14- **Zhou Z, Chen P, Peng H.** Are healthy smokers really healthy? Tob Induc Dis. 2016; 14(1):35.

15- **Liu W, Tao ZW, Wang L, Yuan ML, Liu K, Zhou L, et al.** Analysis of factors associated with disease outcomes in hospitalised patients

with 2019 novel coronavirus disease. Chin Med J 2020; 133(9): 1032–1038.

16-**National Health Comission of the People's Republic of China.** New coronavirus pneumonial diagnosis and treatment program (3rd ed.) (in Chinese).2020. Available at http://www.nhc.gov.cn/xcs/zhengcwj/202001/f492c9153ea9437bb587ce2ffcbee1fa.shtml. [accessed Feb 10, 2020].

17-**World Health Organization.** WHO Director-General's opening remarks at the media briefing on COVID-19 - 3 March 2020. Available   at https://www.who.int/dg/speeches/detail/who-director-general-s-opening-remarksat-the-media-briefing-on-covid-19---3-march-2020.

18-**Gargaglioni LH, Marques DA.** Let's talk about sex in the context of COVID-19. J Appl Physiol (1985) 2020 ; 128(6):1533-1538.