

Symptom Analysis of Confirmed Covid-19 Patients at Allied Hospitals of Rawalpindi Medical University, Pakistan

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ABSTRACT

Background: Coronavirus can cause respiratory disease ranging from mild upper respiratory tract illness to severe pneumonia, acute respiratory distress syndrome, and death. The purpose of this research was to analyze the relationship of gender and age with symptoms of COVID-19 disease.

Material and Methods: This cross-sectional study was conducted at the Rawalpindi Institute of Urology and Transplantation (RIUT), Rawalpindi Medical University, Rawalpindi Pakistan during the month of March, 2020. Consecutive sampling methodology was used, and all real-time polymerase chain reaction (RT-PCR) confirmed patients of COVID-19 were included. Data regarding age, gender, and symptoms with onset was recorded and analyzed using Chi-square and Student t-tests with P -value $\leq .05$ considered as significant.

Results: Ninety-eight patients, 68 (69.4%) males and 30 (30.6%) females were included in the study. Fifty-five (56.1%) were symptomatic and the rest were asymptomatic. Mean duration of symptoms in symptomatic cases was 2.8 ± 1.1 days. Of these, 60 (61.85%) were older than 40 years and 17 (17.34%) had a history of travel. Fever and persistent cough were reported by more than 50% patients. Fatigue, sore throat, shortness of breath and myalgias and headaches were reported by 32-21% patients. Nausea, Vomiting, runny nose, sputum, diarrhea and anorexia were reported by less than 11% patients. Fever, dyspnea and nausea was more in individuals over 40 years. Dyspnea was more in males and fatigue was more in females.

Conclusions: Many of our COVID-19 infected patients were symptomatic with fever and cough as the most common symptoms. Fatigue, sore throat, shortness of breath, myalgias and headaches were also reported by some patients. Nausea, vomiting, runny nose, sputum, diarrhea and anorexia were the least reported symptoms. Individuals older than 40 years are more likely to be symptomatic, regardless of gender. Recognition of the pattern of these symptoms is essential for early diagnosis and management of the disease.

Key words: Coronavirus, Cough, COVID-19, Fever, Symptoms.

Authors' Contribution:

¹Conception; Literature research; manuscript design and drafting; ^{2,3} Critical analysis and manuscript review; ⁴⁻⁷Data analysis; Manuscript Editing.

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Article info:

Received: June 20, 2020
Accepted: December 15, 2020

Cite this article. Malik J, Khurram M, Mughal AM, Chaudhary NA, Aziz Q, Khan MM, Manzoor MS. Symptom Analysis of Confirmed Covid-19 Patients at Allied Hospitals of Rawalpindi Medical University, Pakistan. *J Islamabad Med Dental Coll.* 2020; 9(4): 235-241. Doi: 10.35787/jimdc.v9i4.607

Funding Source: Nil
Conflict of Interest: Nil

Introduction

Coronavirus belongs to the family Coronaviridae.^{1,2} Coronavirus disease 2019 (COVID-19) is a respiratory disease caused by a novel coronavirus that was first reported in December, 2019 at Wuhan, China. This highly infectious disease manifests at first as dry cough, fever, myalgia and difficulty in breathing. On the other side of the spectrum, this disease may manifest as acute respiratory distress syndrome, septic shock, bleeding and coagulopathy.^{3,4}

Though coronaviruses are generally thought to be zoonotic, COVID-19 is believed to spread from human to human.^{5,6} This virus has been spreading very quickly and has prevailed over more than 180 countries and territories causing more than 1.9 million cases and 123010 deaths worldwide until April 15, 2020. In Pakistan, 5988 confirmed cases and 107 deaths have been reported so far.^{7,8,9}

Symptom-based evaluation of COVID-19 patients in our population is deficient. The use of laboratory investigations for diagnosis of COVID-19 infection needs to be on a large scale, keeping in mind the pandemic nature of the disease.¹⁰ This can exhaust resources of even the developed countries let alone the developing ones. In this situation, an understanding of COVID-19 symptomatology becomes an utmost necessity for the initial screening of suspected cases and to prioritize them for further investigations. The objective of this study was to note the symptoms of Real-Time Polymerase Chain Reaction (RT-PCR) confirmed COVID-19 patients. Additionally, the age group wise differences in symptomatology were also sought.

Material and Methods

This cross-sectional, observational study was conducted at Rawalpindi Institute of Urology and Transplant (RIU&T), which is the COVID-19 patient management center of Rawalpindi Medical

University (RMU), Rawalpindi Pakistan, during March 2020. Ethical approval was obtained from the Institutional Research Forum of Rawalpindi Medical University. Informed consent was taken from the patients. By consecutive sampling, 98 RT-PCR positive, confirmed cases of COVID-19 were included in the study. Patients with comorbidities such as chronic respiratory and hematological illnesses, neoplastic disorders, endocrinopathies, immunodeficiency states, gastrointestinal diseases, and cardiovascular disease were excluded. Five patients were excluded from the study due to presence of comorbidities. Asymptomatic patients were followed up regularly to observe the development of symptoms. After their discharge, they were also contacted through telephone to confirm their asymptomatic status.

Age, gender, symptoms and their duration, and travel history were sought from all the patients. Data was entered and analyzed using Statistical Package for Social Sciences (SPSS) version 25.0. Quantitative variables like age and duration of symptoms were reported as mean and standard deviation. Qualitative ones like gender, symptoms, and travel history were recorded as frequencies and percentages. The presence or absence of symptoms and the individual symptoms were compared between, age groups, gender, and travel history. Individual symptoms were also compared between different age groups. Chi-square and Student t-tests were used for this purpose. P -value $\leq .05$ was considered significant.

Results

Out of the 98 patients, 55 (56.1%) were symptomatic and the rest were asymptomatic. Mean duration of symptoms in symptomatic cases

was 2.8±1.1 days. Median time from symptom onset to admission was 3 days.

Sixty-Eight (69.4%) were male and 30 (30.6%) were females. Of these 39 (57.4%) males and 16 (53.3%) females were symptomatic, respectively. The mean patient age was 45.5±17.8 years with 38 (38.77%) were younger than 40 years and 60 (61.85%) older than 40 years. Of these 20 (52.6%) and 35 (58.3%) patients were symptomatic in each group, respectively. Seventeen (17.34%) had a history of travel with 68.8% symptomatic while 81 (83.50%) did not have a travel history with 53.1% symptomatic individuals (Table I).

Fever and persistent cough were observed in more than 50% of the patients as shown in Figure 1. Fatigue, sore throat, shortness of breath, myalgias and headaches were reported by 32.7%, 29.1%, 27.3%, 27.3% and 21.8% of our patients. Nausea, Vomiting, runny nose, sputum, diarrhea and anorexia were reported by less than 11% patients.

There was a significant difference in the presence or absence of fever between age groups with only 26.3% of the under 40-year-old having fever as

compared to 48.3% of over 40-year-olds ($P = .03$) (Table II).

Regarding presence or absence of dyspnea, 2.6% of under 40-year-olds had dyspnea as compared to 23.3% of over 40-year-olds ($P = .006$). The difference in the presence of dyspnea between genders was significant with 20.6% males reporting dyspnea compared to 3.3% females ($P = .029$) (Table II). There was a significant difference between age groups in the presence or absence of nausea ($P = .044$), as well as presence or absence of fatigue between genders ($P = .011$) (Table III).

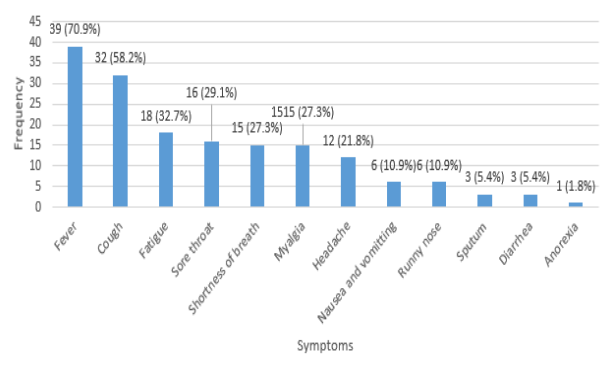


Figure 1: Symptoms of patients presenting with COVID-19

Parameter	Total n=98 (100%)	Symptomatic n= 55 (56.1%)	Asymptomatic n= 43 (43.87%)	P-value*
Mean age (years)	45.5±17.8	46 ± 15.8	44.93 ± 19.46	.774
Age Quartiles (years)	<40	38 (38.77%)	20 (52.6%)	.579
	≥40	60 (61.22%)	35 (58.3%)	
Gender	Male	68 (69.38%)	39 (57.4%)	.712
	Female	30 (30.61%)	16 (53.3%)	
History of Travel	Yes	17 (17.34%)	11 (68.8%)	.249
	No	81 (82.65%)	43 (53.1%)	

*P-value < .05 was considered statistically significant

Variable	Fever n (%)	No fever n (%)	P-value*	Dyspnea n (%)	No Dyspnea n (%)	P-value*	
Age Quartile	<40 years old	10 (26.3)	28 (73.7)	.03	1 (2.6)	37 (97.4)	.006
	≥40 years old	29 (48.3)	31 (51.7)		14 (23.3)	46 (76.7)	
Gender	Male	29 (42.6)	39 (57.4)	.385	14 (20.6)	54 (79.4)	.029
	Female	10 (33.3)	20 (66.7)		1 (3.3)	29 (96.7)	

*P-value < .05 was considered statistically significant

Table III: Relationship of fatigue and nausea with age groups and gender

Variable		Fatigue present n (%)	No fatigue n (%)	P-value*	Nausea n (%)	No Nausea n (%)	P-value*
Age Quartile	<40 years old	6 (15.8)	32 (84.2)	0.600	0 (0)	38 (100)	0.044
	≥40 years old	12 (20)	48 (80)		6 (10)	54 (90)	
Gender	Male	8 (11.8)	60 (88.2)	0.011	3 (4.4)	65 (95.6)	0.288
	Female	10 (33.3)	20 (66.7)		3 (10)	27 (90)	

*P-value < .05 was considered statistically significant

Discussion

Clinical features of COVID-19 may vary depending on the region. They may differ even in the same country. According to a study, clinical features of COVID-19 at Wuhan were different from those in other areas of China, at least in the initial period of the pandemic.¹⁰ The reason behind this might be the different host, environment and agent factors. Important findings of our study are male preponderance, mean age less than 40 years, only 60% of COVID-19 patients managed were symptomatic, fever and shortness of breath were commonest symptoms noted in more than 50% patients, and anorexia, myalgia and fatigue were relatively uncommon symptoms.

Males show a comparatively weaker immune response to infectious agents as compared to females.¹¹⁻¹⁵ This is due to the difference in hormones between the sexes, the difference in the number of copies of X-linked genes related to immunity, and the difference in the disease susceptibility genes between males and females.^{11,12} This and possibly more outdoor exposure may increase the chances of male gender predominance with reference to COVID-19 infection as has been noted in various studies.^{16,17} In a Chinese COVID-19 analysis focusing 44,672 confirmed patients, male to female ratio was 54.4%:48.6%.¹⁸ We also noted male predominance in our study with 69.4% of the male patients.

Around 40% of our patients were less than 40 years old. According to an analysis, 27.2% of COVID-19

patients managed in China were younger than 40 years and 86.6% patients were in the age range of 30-79 years.¹⁸ In the study by Huang et al., the median age was 49 years while in the study by Xu et al., it was 41 years.^{10,16} The reason for the lesser median age in our patients is that the Pakistani population mainly consists of younger persons with a median age of 22.8 years.²⁰

Travel history of countries where COVID-19 infection is prevalent is important in the context of the spread of infection. According to a study, travel history is more important than chest radiograph findings for early detection and isolation.²¹ The first case in the USA had also traveled from China.²² About a quarter of our patients had a positive travel history while the rest had locally transmitted infections. Interestingly none had visited China.

Persons with RT-PCR confirmed COVID-19 infection who neither had any symptoms at the time of test nor did they showed any symptoms on follow-up were termed as asymptomatic laboratory-confirmed cases. About 5%-80% of persons who are mostly children and young adults are tested positive, but do not have symptoms according to an analysis.²³ Asymptomatic cases are important in the spread of the disease as a false sense of security might compromise the practice of preventive measures. Asymptomatic patients can also be a source of continuous infection and a sustained level of infected cases in the community. They can become a hurdle in complete eradication of the disease even if the pandemic is over. According to

WHO, although asymptomatic transmission of COVID-19 is rare according to the available data, but it cannot be ignored.²⁴ A study reports the transmission of COVID-19 from one asymptomatic family member to five members of the same family.²⁵ More than forty percent of our COVID-19 confirmed cases were asymptomatic. Out of these, 47.4% were less than 40 years old. A better immune response can be the reason for the same in young infected persons.²⁶

In a study by Xu et al., cough (81%) and fever (77%) were the commonest symptoms.¹⁰ In another study by Huang et al., fever was present in 98%, cough in 76%, and sputum production in 28.6% of the patients.¹⁶ About 1.4-7.6% of mild and 32.6% of severe COVID-19 infected patients complained of shortness of breath.²⁷ According to Menni et al., anosmia was present in 59.4% of COVID-19 cases.²⁸ Out of the 56% symptomatic cases in our study, fever (61.9%) and cough (57%) were most frequently noted. We did not observe anosmia in any patient. In our study, fatigue, anorexia, and myalgia were least reported symptoms, although these have been reported in 44-50% of COVID-19 patients.^{10,16} Interestingly, anorexia and myalgia were significantly more common in our older patients. Time from symptom onset to admission in our patients was three days. This is lesser than the median time of 6.5 days reported in a previous study.¹⁰ This might be due to the anxiety of the community towards minor symptoms of the disease, when mild to moderate disease can be managed safely at home.

This study focused on laboratory-confirmed COVID-19 patients as RIU&T is the center point of such patient management of the Rawalpindi district of Pakistan. The majority of these patients were diagnosed with contact tracing rather than attending a health care facility for symptoms. This along with the fact that many infected persons are asymptomatic may have skewed our findings.

Additionally, a smaller sample is a limitation. This however, has to be kept in mind that to our knowledge this study is the first of its kind in our country that can help in the standardization of COVID-19 symptoms for improving symptom-based initial screening. Due to lack of specific treatment until now and the role of conservative management in mild to moderate symptoms of COVID-19, the rush to hospitals can be discouraged, which will prevent the spread of the disease.

Conclusion

Many of our COVID-19 infected patients were symptomatic. Fever and cough were the commonest symptoms in these patients. Fatigue, Sore throat, shortness of breath, myalgias and headaches were also reported by some. Nausea, vomiting, runny nose, sputum, diarrhea and anorexia were the least reported symptoms. Individuals older than 40 years are more likely to be symptomatic regardless of gender. Recognition of the pattern of these symptoms is essential for early diagnosis and management of the disease.

Acknowledgment

We would like to acknowledge the efforts of all our colleagues who are fighting against the COVID-19 pandemic.

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