Original Article

Demographic Characteristics of COVID-19 Patients in District Gujrat

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Abstract

Objective: To determine the prevalence of Covid-19 in the district of Gujrat, its association with gender, age, its correlation with respiratory and cardiac symptoms and to find the link of this disease with travel history of patients to affected areas.

Methodology: A total of 222 COVID-19 -Positive patients (Male and Female) out of 514 clinically suspected cases (fever, cough, dyspnoea, lethargy & anosmia) as per WHO guidelines were selected. The use of the data for research purposes was explained to patients and informed consent was taken. The study was approved by the ethical committee of Aziz Bhatti Shaheed Hospital. Samples were extracted from nasopharyngeal swabs using standard extraction protocol. Statistical tools used was SPSS Version 24. Chi-square test and correlation of age with respiratory and cardiac symptoms was calculated.

Results: Male gender was significantly affected by this disease (P=0.001) as compared to the female gender. Regarding the prevalence of respiratory symptoms, 31(14%) were asymptomatic. 37(16.7%) had Dyspnea, 45 (65.3%) cough (P= 0.001). Nine (4.1%) developed pneumonia. Fever and Cough was the most common symptom in the age group 21-40 yrs(P=0.001). While pneumonia developed in the older age group. The cardiac symptoms appeared in young age group (p=0.000) in the age group 21-40 yrs (70.9% n=78).38 patients (17.2%) had the symptom of chest pain, 24(10.9%) tachycardia and 1(0.5%) developed arrhythmia. Out of 222 COVID positive patients, 67.1% (149) gave a history of direct contact with positive patients, 19.8% (n=44) gave travel history,4.5% (n=10) had a history of going to Raiwind Ijtamah and 8.6% (n=19) were zaireen/pilgrims from Taftan.

Conclusion: The COVID -19 is comparatively more common in male patients. 50% of the patients were of age group 21-40 years showing the symptoms of fever and cough along with mild cardiac symptoms. Acute pneumonia developed in older age groups while cardiac symptoms were significant in young age. In Gujrat District, the majority of the patients (67.1%) developed Covid-19 due to travelling.

Keywords: Age, Covid-19, Gender, Patients, Prevalence, Travel.

Introduction

Severe Acute Respiratory Syndrome Corona virus-2 (SARS-Cov-2) rapidly spread and led to an outbreak in China and then became a global health emergency. Today globally confirmed cases are incredibly high. Through the week ending 2 August, 17.6 million confirmed Covid-19 cases, including more than 680 000 deaths have been reported to WHO. In Pakistan confirmed cases are 280 029 and total deaths reported are 17190.[1] Although control preventive measures used was the isolation of the patients, the infection has increased and became a pandemic.[2] The first case of pneumonia emerged in the city of Wuhan, Hubei Province, China, in early December 2019. From these patients, a novel coronavirus had been isolated, and subsequently, it was named as 2019 novel coronavirus (2019-nCoV) on January 12, 2020and later as SARS-CoV-2. This disease was mostly associated with Human Seafood, but soon the disease spread rapidly to other areas of the country. On January 19, 2020, two cases in Beijing and one case in Guangdong Province were reported, and subsequently more cases were reported elsewhere.[3]

This is a viral respiratory infection, SARS-CoV-2 or COVID-19 can be transmitted through the respiratory tract. It mainly causes respiratory tract infections and develops severe pneumonia in infected patients. The disease may progress to respiratory failure and death. Everyone is at risk of catching this infection, but the elderly and those with underlying diseases are more susceptible and are at risk of adverse outcomes.[2]The virus main entranceway is through mucosal tissues of the nose, mouth, upper respiratory tract, and conjunctival mucosa.[4] In hospitalized patients, it was found that the onset of COVID-19 is associated with symptoms commonly associated with viral pneumonia, most commonly fever, cough and myalgia.[5]

According to the WHO/China Report, 80% of cases in China up to 20 February 2020 have a mild-to-moderate disease which includes both pneumonia and non-pneumonia cases; whilst 13.8% developed severe disease and 6.1% progressed to a critical stage and needed intensive care. In a study of clinical progression in 1,099 patients, it was found that people over the age of 60 years and those with underlying conditions (hypertension, cardiovascular disease, diabetes and chronic respiratory disease) were more at risk.[6] Through hospital surveillance symptoms like atypical pneumonia and/or acute respiratory distress were used to define suspected cases eligible for testing. Emerging evidence from China suggests that coronavirus disease 2019 (COVID-19) is deadlier for infected men than women with a 2.8% fatality rate being reported in Chinese men versus 1.7% in women. Further, sex-disaggregated data for COVID-19 in several European countries show a similar number of cases between the sexes, but more severe outcomes in aged men.[7]

The combination of symptoms (e.g. cough and fever) with recent travel history to the affected region (Wuhan and/or Hubei Province)was found to be a source of spread of infection.[8,9] Such surveillance is therefore likely to detect clinically milder cases but, by initially restricting testing to those with a travel history or link, may have missed other symptomatic cases. More recently, as epidemics have taken off in other countries, cases are now being detected in those with no reported travel links to Wuhan/Hubei province through broader surveillance systems.[10]

The border countries of Pakistan highly affected including China, where the COVID-19 outbreak experienced the first time. In the west, Italy with the highest number of COVID-19 mortalities while in the north, Iran a high number of mortalities after Italy. Initially, all of the confirmed cases had recent travel history from Iran, Syria and London. And currently, these cases increase by high rate and the situation is worst.[11]

In contrast, others will represent the severe end of the disease spectrum with an increasing number identified through hospital surveillance (for example, testing of viral pneumonia) or in a few cases, at post-mortem analysis.[6]

The study aims to find the prevalence of this disease and its association with risk to the gender, the common symptoms presented by the cases and link to travel history to affected areas.

Methodology

This Cross-sectional Study was carried out in the Aziz Bhatti Shaheed Hospital affiliated with Nawaz Sharif Medical College, University Of Gujrat, Pakistan. Study duration was 01 months.

All patients were between 15 and 80 years visiting the hospital from 7th April to 15th May 2020. The total sample size was 514.

Inclusion criteria were patients admitted with COVID 19 symptoms, had laboratory-confirmed SARS-COV 2 infection as determined by PCR test, illness of any duration and on of following: Radiographic Infiltrates by imaging (chest x-ray, CT Scan), OR clinical assessment (evidence rales/crackles on the exam) and SPO2 less than 94% on room air, Requiring supplementing oxygen or Requiring mechanical ventilation.

The study protocol was approved by the Ethics Committee of Aziz Bhatti Shaheed Hospital, Gujrat, Province Punjab. The population of Gujrat is 2,756,110, covering an area of 3,192 km². Out of 514 cases, 222 cases meeting the inclusion criteria were selected. Consecutive Non-Random sampling technique was used. The assumption for sample calculation is that it is a single centred study. We selected all the patients that came to our centre.

RNA samples were extracted from nasopharyngeal swabs secretions using standard extraction protocol. The tests were performed in the molecular biology lab. Laboratory had DNA free equipment with negative pressure known as BIOSAFETY LEVEL 3 Lab.

WHO sample size calculator was used to find out the sample size. Data was entered and analyzed in the statistical package for social sciences Version 24. Chi-square test was applied to calculate the significance of qualitative variables. Spearman correlation was calculated to find an association between age and symptoms. $P < 0.05$ was considered to be statistically significant.

Results

Males were highly significantly suffering from this disease (P=0.001) (Table-1) as compared to females who are usually non-working in our society and remain indoors and lesser exposed to a person to person contact and interaction. Age is significantly associated with gender (P=0.001) (Figure 1). Female patients who had this disease gave a history of the same infection to the male members of the family. The number of males was 159 (71.6%) and females 63 (28.4%). The 50% of patients (n=111) were seen in the age group 21-40 years and 22.1% (n=49) were found in the age group 41-60 years.76.6% males and 23.4% of females were found in the age group 21-40 years (Figure 1).
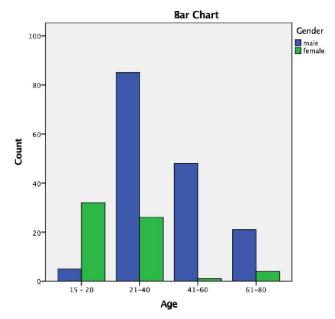

Figure 1: Distribution of male and female in Patients of different age groups (years)

Table 1: COVID-19 Positive patients of different age groups presenting with respiratory symptoms

		Respiratory symptoms				Total	Chi-square test
		nil	Dyspnoea	Cough	Pneumonia		
Age	15 - 20	14	0	23	0	37	
	21-40	17	34	60	0	111	
	41-60	0	3	40	6	49	**P=0.000**
	61-80	0	0	22	3	25	
Total		31	37	145	9	222	

Regarding the prevalence of respiratory symptoms, 31(14%) were asymptomatic. 37(16.7%) had Dyspnea, 45 (65.3%) cough P= 0.001 and 9 (4.1%) developed pneumonia. The cough was the most common symptom in the age group 21-40 years(P=0.001) while pneumonia developed in older age group (61-80 years). A possible reason for the development of pneumonia in this age group could be decreased immunity in this age group.

Out of 221 cases 71.5%(n=158) had no cardiac symptoms(P=0.001).Most of these were found in age group 21-40 years (70.9% n=78) (P=0.000).

38 people (17.2%) had a symptom of chest pain, 24(10.9%) tachycardia and 1(0.5%) developed arrhythmia. Two patients (male) died due to the development of complications (Pneumonia and myocarditis).

Correlation between age and respiratory symptoms (Table 2) show a positive correlation. As age increases there is also increase in severity of symptoms such as pneumonia.

Table 2: Covid-19 Positive patients of different age groups presenting with cardiac symptoms

		Cardiac symptoms				Total	Chi-square test
		nil	chest pain	Tachycardia	Arrythmia		
Age	15 - 20	17	11	8	1	37	
	21-40	78	16	16	0	111	**P=0.000**
	41-60	45	4	0	0	49	
	61-80	18	7	0	0	25	
Total		158	38	24	1	222	

On contrary cardiac symptoms are negatively correlated. Young people developed more cardiac symptoms (Table 3) as compared to old patients.

Table 3: Correlation matrix showing the Spearman's correlation coefficient (rs) for age groups with respiratory and cardiac symptoms

			age of participants	Cardiac symptoms
Spearman's rho	**age of participants**	Correlation Coefficient rs	1.000	-.272**
		Sig. (2-tailed) p		.000
		N	222	222
	age of participants	Correlation Coefficient rs	1.000	.400**
		Sig. (2-tailed) p		.000

Out of 222 patients, 67.1% (149) gave a history of direct contact with positive patients, 19.8% (n=44) gave travel history, 4.5% (n=10) had a history of going to Raiwind Ijtamah and 8.6% (n=19) were zaireen/pilgrims returning from Taftan.
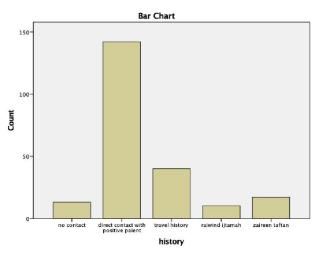
Figure 2: History of Covid-19 positive patients

Discussion

Coronavirus is defined as a family of viruses which cause illness which ranges from the common cold to acute pneumonia, such as SARS [10] and Middle East Respiratory Syndrome (MERS).[11] The Chinese Centre for Disease Control and Prevention (CDC) identified SARS-CoV-2.[13] Epidemiological [14,15] and clinical [16,17] features of patients suffering from Covid-19 have been reported. However, prognostic factors of Covid-19 are yet to be reported in detail. In our study, males were suffering from the disease in greater significance (P=0.001) as compared to females who are usually non-working in our society and remain indoors and lesser exposure to a person to person contact and interaction. The females who were COVID-19 positive gave a history of the same infection to the male members of the family. Hence, the number of males was 159 (71.6%) and the number of females was 63 (28.4%). 50% of the patients (n=111) were seen in the age group of 21-40 yrs and 22.1% (n=49) were found in the age group of 41-60 yrs.

Older patients (65 yrs old and above) were more likely to suffer from severe COVID-19. Men tend to develop more serious symptoms than women, according to the clinical classification of severity. According to public data set of COVID-19, it was found that the % of older age (65 yrs and above) was much higher in patients who were deceased than in the patients who survived (83.8% in 37 patients deceased vs 13.2% in 1019 patients who survived). Additionally, the number of men in deceased patients is 2.4 times that of women. Although men and women have the same

susceptibility, men are conclusively more prone to dying.[18]

This study investigated the role of gender in the morbidity and mortality of the SARS-CoV-2 infection. One study of which consisted of 425 patients with COVID-19 indicated that 56% of them were males.[14] While another study of 140 patients established that 50.7% were males.[18] In another similar study, susceptibility to SARS-CoV-2 was observed between males and females in 1,019 patients who survived (50.0% males), collected from a public data set and in a case series of 43 patients who were hospitalized (51.2% males). Although deceased patients were solder than the patients who had survived COVID-19, ages were comparable for males and females in both deceased as well as patients who survived. Therefore, it can be established that gender is a risk factor for high severity and mortality in patients suffering from COVID-19, regardless of age and susceptibility.[19]

The gender factor, as well as high incidence rate in men for most diseases, could correlate with the general demographic fact of shorter life expectancy in men when compared to women in the world. Although there seems to be no notable difference in median age amongst male and female groups, the maximum range of IQR is lower in males in case series. In 2003, the data collected from a population of 520 SARS patients which included 135 deaths in Beijing[20] summarised the lessons for present use, as SARS-CoV-2 and SARS-CoV attack tissue cells via the same receptor i.e. ACE2.[21] We have reported that high protein expression of receptor ACE2 in specific organs correlated with particular organ failures, as indicated by corresponding parameters in SARS patients.[20,22] It has been observed that the circulating ACE2 levels are greater in men than in women as well as in patients with diabetes and/or cardiovascular diseases[23] leading to greater morbidity and mortality in patients suffering from COVID-19. Men with COVID-19 are at higher risk for worse outcomes including death, regardless of age.[19]

Out of 222 cases, 71.5% (n =158) of the cases had no cardiac symptoms (P=0.001). Majority of these were found in the age group of 21-40 years (70.9% n=78) P=0.000.38 people (17.2%) displayed symptoms of chest pain, 24 (10.9%) showed tachycardia and 1 (0.5%) had developed arrhythmia.

Regarding the prevalence of respiratory symptoms, 31 (14%) were asymptomatic. 37 (16.7%) developed dyspnea, 45 (65.3%) developed cough P= 0.001 and 9 (4.1%) had developed pneumonia. The cough was the most prevalent symptom in the age group of 21-40

years (P=0.001) while pneumonia had developed in the older age group of (61-80 years). A probable reason for the development of pneumonia in this specific age group could be the decreased immunity with an increase in age.

From Jan 21, 2019, when the first case of Covid-19 was identified, up to Feb 15, 2020, in a study based on 2123 patients in Fever Clinic, due to fever and/or respiratory symptoms, 342 of the patients were confirmed to have developed pneumonia by CT scan, or in some cases by chest x-ray. The presence of COVID-19 in pneumonia patients was 6.14% (21/342). Whereas the presence of COVID-19 in cases that had developed pneumonia sent for 2019-nCoV testing, was at 23.9% (21/88).[24]

The data collected from China depicts a radical increase in the number of cases of pneumonia with an increase in age. Our results, however, suggest a very low fatality ratio in those who are under the age of 20. Albeit, as there are very few noted cases in this age group, it remains to be seen whether this reflects a low mortality rate or a difference in susceptibility. Therefore, serological testing in this age group can prove to be critical in the coming weeks to understand the importance and significance of this age group in driving population transmission of the disease. There is a transparent rise in the estimated CFR from the age of 50 and upwards, with the proportion rising from approximately 1% in the age group of 50-59 to 13% in those who are aged 80 and above. The increase in severity with an increase in age is reflected in case reports in whom the mean age usually is in the range of 50 to 60 years. Different surveillance systems ought to pick up a different age-case-mix and we discovered that those displaying milder symptoms detected through the history of travelling are younger on average than those who were detected through hospital surveillance.[25]

According to a study of 150 patients from 2 hospitals in Wuhan, China, shock seemed to be a significant reason for death in 40% of patients and may be associated with fulminant myocarditis. Further studies on risk factors associated with shock in patients who are COVID-19 are lacking. Varying majority of available studies seem to report unadjusted estimates. Despite methodological restrictions and limitations, studies suggest that old age, low lymphocyte count, comorbidities (diabetes in particular along with cardiovascular disease including hypertension), high D-dimer level, and cardiac injury are important risk factors that need to be considered.[26]

Out of the 222 COVID-19 positive patients, 67.1% (149) patients gave a history of direct contact with positive patients, whereas 19.8% (n=44) gave travel history, and 4.5% (n=10) had a history of going to Raiwind Ijtamah, while 8.6% (n=19) were pilgrims returning from Taftan.

Conclusion

The disease is more prevalent in men rather than women. 50% of the patients were of age group 21-40 years showing the symptoms of fever and cough along with mild cardiac symptoms. Complications like acute pneumonia developed in older age groups, while cardiac symptoms were more commonly seen in young patients. In Gujrat, majority of the patients (67.1%) developed COVID-19 due to travelling to other vicinities.

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