Sociodemographic Factors and Clinical Profile of Covid-19 Patients Admitted in a Tertiary Care Centre of Central Rajasthan, India

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ABSTRACT

BACKGROUND

Covid-2019, caused by severe acute respiratory syndrome-coronavirus-2 (SARS CoV2), is an ongoing pandemic that emerged from China in November 2019. It has affected millions of people worldwide causing significant morbidity and mortality. We wanted to analyse the clinical and demographic profile of Covid-19 patients admitted in a tertiary-care-centre in the central part of Rajasthan, compare their characteristics with other studies published from parts of Northern-India and identify factors associated with delayed recovery and mortality.

METHODS

This was a retrospective observational analysis of the clinical features, and epidemiological profile of Covid-19 positive patients admitted at a tertiary-care-centre in the Central part of Rajasthan.

RESULTS

A total of 422 patients was enrolled in the study. The male: female ratio was 1.34 with a mean age of 34.1 years. Almost 195 (46.2 %) patients were in the age group of 20 - 40 years. Respiratory diseases were the most common co-morbidity seen in 36 patients (8.53 %), diabetes-mellitus in 28 patients (6.63 %), hypertension in 22 patients (5.2 %). Fever was the commonest presenting symptom (N = 98, 77.17 %), followed by cough (N = 85, 66.93 %), and breathlessness (N = 51, 45.67 %). Factors significantly associated with mortality were age group of 60 - 80 year (P < 0.001), presence of co-morbidities (P < 0.001) and history of smoking & alcohol consumption (P < 0.001). Among co-morbidities diabetes-mellitus, hypertension, chronic-respiratory-diseases & chronic-kidney-diseases had significant impact on mortality. Absence of co-morbidity, lack of addiction and symptoms at the time of presentation were associated with an earlier conversion of reverse transcription polymerase chain reaction (RT-PCR) report.

CONCLUSIONS

Clinical spectrum of COVID 19 varies widely. Presence of comorbidities, addiction, radiological features has a drastic impact on mortality and duration of infectivity.

KEYWORDS

SARS CoV-2, Covid-19, RT PCR, Coronavirus

BACKGROUND

The 2019 novel corona virus (2019-nCoV; SARS-CoV-2) or Covid-19 as the disease is named, has rapidly spread worldwide from its place of origin in Wuhan City of Hubei Province of China.[1] This is the third corona virus with pandemic potential that emerged among the human population in the last two decades. The other two were the severe acute respiratory syndrome corona virus (SARS-CoV) outbreak in 2002 and the Middle East respiratory syndrome corona virus (MERS-CoV) outbreak in 2012. Human-to-human transmission via droplets as well as through contact with fomites seems to be the most common route of the virus spread. Since 80 % of the infected population are either asymptomatic or have mild disease, people have been going to their workplaces and even traveling. Nevertheless, even though the virus is causing mild disease in many, the course of illness may be severe, leading to hospitalisation and even death in elderly or those with co-morbid conditions.[2] Guan et al.[3] published a report on 1099 patients with laboratory confirmed Covid-19 from 552 hospitals in 30 provinces, autonomous regions, and municipalities in mainland China through January 29, 2020. The most common symptoms reported were fever (43.8 % on admission and 88.7 % during hospitalisation) and cough (67.8 %), while shortness of breath (18.7 %), myalgia (14.9 %), sore throat (13.9 %), chills (11.5 %), diarrhoea (3.8 %) were the reported symptoms. Severity of the disease was reported more in elderly and in patients with co-morbidities (in 24.9 %). Overall mortality in this study was 15 patients (1.4 %). Till 22october 2020 there have been more than 77 lakh cases reported from India and reported mortality was 1.51 %. In Delhi reported cases were 3.44 lakh with mortality of 1.80 % and in Rajasthan reported cases were 1.80 lakh and mortality of 1 % as on 22nd October.[4]

Although clinical features and impact of co-morbidities seems to be identical throughout the globe, the frequencies of these vary with region.

We intended to describe the socio-demographic and clinical profile of Covid patients admitted at a tertiary care centre of central Rajasthan. And also to determine the factors associated with mortality among these patients.

METHODS

This retrospective observational study analysed the epidemiological features, clinical manifestations and outcome of Covid-19 positive patients admitted to Covid care facilities (wards and ICUs) of a tertiary care centre till 20th June 2020. All individuals with suggestive symptoms or requiring hospitalisation for any medical treatment, who met the criteria for a suspected case as per guidelines of Ministry of Health and Family Welfare (MoHFW) and State Health Department[5] were admitted to hospital. The nasopharyngeal and oropharyngeal swabs were tested at the Advanced Clinical Research Laboratory of the institute for diagnosis of Covid-19 using quantitative polymerase chain reaction for confirmation. The study was approved by the institutional research and ethical committee.

Inclusion Criteria

All laboratory-confirmed cases were included in this study and the epidemiological, clinical, and laboratory data were recorded from bedside tickets, face to face interviews and telephonic calls.

Exclusion Criteria

The patients who were admitted after 1 / 6 / 2020 were excluded from outcome analysis in view of change in guidelines that patients with mild symptoms and asymptomatic patients can be discharged after single negative sample of Covid-19 or may not be admitted but advised home isolation only.[6]

Statistical Analysis

The data so collected were tabulated systemically. Categorical variables were expressed as number and percentage and were analysed using chi square test. A P-value of < 0.05 was taken as statistically significant. All statistical analysis was done using Epi Info version 7.2.1.0 statistical software.

RESULTS

Characteristics of the Patients

A total of 422 patients were enrolled in the study. The male: female ratio was 1.34 among the enrolled participants with a mean age of 34.1 years. Almost 195 (46.2 %) patients were in the age group of 20 - 40 years (Table 1). Only 53 (12.5 %) patients had a travel history among the total patients enrolled for the study. Respiratory diseases were the most common co-morbidity seen in 36 patients (8.53 %) followed by diabetes mellitus in 28 patients (6.63 %) and hypertension in 22 patients (5.2 %) among the total enrolled patients. Smoking was the most common addiction seen in 82 patients (19.43 %) followed by tobacco chewing in 51 patients (12.08 %).

Clinical Features

Out of the total 422 enrolled patients in the study, 127 patients had at least one symptom (30.1 %) while 295 patients (69.9 %) were asymptomatic. Fever was the most common presenting symptom (N = 98, 77.17 %) followed by cough (N = 85, 66.93 %) and shortness of breath (N = 51, 45.67 %). Anosmia was present in 33 (26 %) and loss of taste was present in 23 (23.62 %) patients out of the total symptomatic patients. (Table 2)

Factors Associated with Mortality

Factor significantly associated with mortality were age group of 60 - 80 year (P < 0.001), presence of any co-morbidity (P < 0.001) and history of smoking & alcohol consumption (P < 0.001). Among comorbidities diabetes mellitus, hypertension, chronic respiratory diseases & chronic kidney diseases had significant impact on mortality, while presence

of pregnancy was not a risk factor for mortality (Table 4). Patients who had leucocytosis or leucopenia had higher risk of mortality than patients who had a normal leucocyte count (P < 0.001). Patients with was any chest x ray abnormality had higher risk of mortality than patients who had a normal chest x ray (P < 0.001).

Out of total 16 patients expired, 13 patients had multiple co-morbidities and 2 patients had single co-morbidity and 1 patient had no co-morbidity. Mortality rate for the duration of study was 3.8 %. Out of 244 patients, in whom two consecutives RT-PCR was considered as a criterion for recovery, 141 (57.79 %) patients were declared as recovered in less than 10 days, while only 16 (6.55 %) patients took more than 20 days to get two consecutive RT-PCR as negative.

		N	% (N = 422)
Age group (years)	< 10	30	7.1
	10 – 19	56	13.27
	20 – 29	109	25.83
	30 - 39	86	20.38
	40 - 49	60	14.22
	50 - 59	43	10.19
	60 - 69	25	5.92
	70 - 79	10	2.38
	80 and above	3	0.71
Gender	Female	180	42.65
	Male	242	57.35
Travel history	Yes	53	12.55
	No	369	87.45
Co-morbidity	DM	28	6.63
	IHD	2	0.47
	HTN	22	5.2
	COPD asthma OSA	36	8.53
	Carcinoma	2	0.47
	Pregnancy	13	3.08
	Others	11	2.61
	None	343	81.28
Addiction	Smoking	82	19.43
	Alcohol	9	2.13
	Tobacco chewing	51	12.08
	None	178	42.18
Table 1. General Characteristics			

		N	%
Symptomatic (N = 127) (30.1 %)	Fever	98	77.17
	SOB	51	45.67
	Sore throat	23	18.11
	Cough	85	66.93
	Rhinitis	14	11.02
	Anosmia	33	26.0
	Loss of taste	30	23.62
Asymptomatic (N = 295) (69.9 %)		295	69.9
X-ray findings * (N = 302)	Normal	234	77.49
	Consolidation only	63	20.86
	Consolidation with patchy opacities	2	.66
	Consolidation with effusion	2	.66
	Fibrocalcific	1	.33
TLC # (N = 292)	Leucopenia	20	6.84
	Normal	214	73.29
	Leucocytosis	58	19.87
Table 2. Clinical Features			

*X ray was not available for 120 patients # TLC count was not available for 130 patients

		N	%
Survival outcome	Recovered	406	96.2
	Death	16	3.8
Duration between 1st positive and double negative (N = 244*)	< 10 days	141	57.79
	10 - 19 days	87	35.66
	≥ 20 days	16	6.55
Table 3. Outcome			

Factors Associated with Duration of Infectivity (1st Positive to Double Negative)

Factors that were associated with an earlier negativity in RT PCR (Table 5) were absence of co morbidities, absence of

symptoms at the time of admission and absence of any history of addiction (P < 0.001).

		Survive (N = 406)	Death (N = 16)	P-Value
Age group (years)	< 20	85 (20.9)	1 (6.2)	< 0.001 (S)
	20 - 40	194 (47.7)	1 (6.2)	
	40 - 60	96 (23.6)	7 (43.7)	
	60 - 80	31 (7.6)	7 (43.7)	
Gender	F	176 (43.3)	4 (25)	0.231
	M	230 (56.6)	12 (75)	
Travel history	Yes	50 (12.3)	3 (18.7)	0.706
	No	356 (87.6)	13 (81.25)	
Co-morbidities	Present	52 (12.8)	12 (75)	< 0.001 (S)
	Absent	354 (87.1)	1 (6.2)	
Individual comorbidity	DM	18 (4.4)	10 (62.5)	< 0.001 (S)
	HTN	17 (4.1)	5 (31.2)	< 0.001 (S)
	COPD / asthma / OSA	27 (6.6)	9 (56.25)	< 0.001 (S)
	Pregnancy / post-partum	13 (3.2)	0	0.875
	Renal disease	3 (0.7)	3 (18.75)	< 0.001 (S)
Addiction	Smoking	72 (17.7)	10 (62.5)	< 0.001 (S)
	Tobacco chewing	47 (11.5)	4 (25)	0.098
	Alcohol	3 (0.7)	6 (37.5)	< 0.001 (S)
TLC*	Leucopenia	9 (2.2)	2 (12.5)	< 0.001 (S)
	Normal	106 (26.1)	1 (6.2)	
	Leucocytosis	36 (8.8)	12 (75)	
X ray#	Normal	138 (33.9)	1 (6.2)	< 0.001 (S)
	Consolidation / opacity / effusion	39 (9.6)	14 (87.5)	
Table 4. Factors Associated with Mortality				

		Negative < 10 Days (N = 141)	Negative > 10 Days (N = 103)	P-Value
Age group (years)	< 40	103 (25.3)	72 (51.0)	0.810
	40 - 60	28 (6.8)	24 (17.0)	
	60 - 80	10 (2.4)	7 (4.9)	
Gender	F	69 (16.9)	45 (31.9)	0.496
	M	72 (17.7)	58 (41.1)	
Travel history	Yes	27 (6.6)	14 (9.9)	0.330
	No	114 (28.07)	89 (63.1)	
Symptom at admission	Yes	19 (4.6)	34 (24.1)	< 0.001 (S)
	No	122 (30.04)	69 (48.9)	
Co-morbidities	Present	6 (1.4)	22 (15.6)	< 0.001 (S)
	Absent	126 (31.03)	78 (55.3)	
Individual comorbidity	DM	1 (0.7)	7 (4.9)	0.023 (S)
	HTN	1 (0.7)	8 (5.6)	0.011 (S)
	COPD / asthma / OSA	4 (2.8)	8 (5.6)	0.145
	Renal disease	0	2 (1.4)	0.346
	Pregnancy / post-partum	10 (7.0)	3 (2.1)	0.241
Addiction	Smoking	19 (13.4)	31 (21.9)	0.003 (S)
	Tobacco chewing	13 (9.2)	20 (14.1)	0.035 (S)
	Alcohol	0	3 (2.1)	0.147
TLC*	Leucopenia	2 (1.4)	7 (6.7)	0.085
	Normal	53 (37.5)	53 (51.4)	
	Leucocytosis	12 (8.5)	24 (23.3)	
X ray#	Normal	71 (50.3)	66 (64.0)	< 0.001(S)
	Consolidation / opacity / effusion	1 (0.7)	25 (24.2)	
Table 5. Factors Associated with Duration of Infectivity (1st Positive to Double Negative)				

DISCUSSION

Our study finds most of the clinical-radiological findings similar to reported data from other parts of the country as well as those published globally.

Mean age, gender distribution was similar to other studies. Of importance was timing of the study. While our data represent almost mid of the pandemic, we could not find a relevant travel history among most of these patients suggesting start of community spread at that point of time. While an Indian study published in the month of April reported that 61.9 % of their Covid-19 positive patients gave a history of travel,[7] another study published in the month of June 2020 found history of travel in only in 18.75 % of patients.[8] Our study included patients till June 2020, and found a travel history in only 12.55 % of cases. Travel

history, although important clue to exposure, does not therefore necessarily be an important factor in the later stages of outbreak.

Another significant difference we came across was the frequency of various co-morbid conditions. Among top four co-morbidities are hypertension, diabetes mellitus, ischemic heart disease and chronic respiratory diseases. Although these are the trends which are reported worldwide, the frequency of these varied. We found respiratory co-morbidity as the commonest one with a frequency of 8.53 %, followed by diabetes mellitus (6.63 %), hypertension (5.2 %). Chronic obstructive pulmonary disease (COPD) (16.96 %) was only second to hypertension (17.85 %) in another series published from Southern part of same state.[8] These findings are in contrast to other national[7] as well as international data where chronic respiratory diseases are far down the list of co-morbidities.[9,10] This high incidence of respiratory co-morbidities from Western part of the country probably reflect the fact that crude prevalence of COPD is higher in state of Rajasthan as compared to other states of the country.[11]

Clinical features did not differ with that of other published data. Loss of taste is now increasingly being recognised as one of the important symptoms first reported. While it was not reported in some of the studies[10,7,8] an early report from United States found its presence in 19 % of cases.[9] We found it in 23.62 % of our cases, more frequent than other upper respiratory symptoms like sore throat and rhinitis. The incidence of this olfactory dysfunction in Covid-19 has varied from 33.9 to 68 % in multiple cross-sectional studies.[12]

The proportion of asymptomatic to symptomatic cases differed significantly in various studies. While we noted almost 70 % of our cases as asymptomatic, this proportion was lower in reports from North Indian state of Delhi.[7,13,14] This difference was probably a result of extensive contact tracing as well as data based on hospitalised patients.

Chest radiology was no different than others. However, it took significantly longer time for two consecutive samples to be negative for those with radiologic abnormalities than those with normal chest radiograph (Table 5).

Among other factors significantly associated with longer period for conversion of RT-PCR to negative were the presence of symptoms, presence of co-morbidities (especially diabetes and hypertension) and history of smoking or tobacco consumption. Complete blood counts were not associated with duration of conversion (Table 5). Similar findings along with additional risk factors of obesity and psychiatric illnesses have been described as risk factors for delayed return to normal health.[15]

A case fatality rate of 3.8 % was observed during the study period. It varied in different studies but was not statistically significant. Higher mortality reported by Choro et al. was[13] probably due to higher proportion of severe and critically ill patients (73; 31.1 % & 43; 18.3 % respectively). Seven (9.6 %) and 12 (27.9 %) patient from respective categories died within 24 hours of admission.

Factors significantly associated with mortality in our series were age more than 60 years, presence of co-

morbidities, smoking and alcohol addiction, altered leukocyte counts and abnormal chest radiographs.

Authors	Present Study	Mahesh Dave (Rajasthan)[8]	Nitesh Gupta (Delhi)[7]	Choro (Delhi)[13]	Anant Mohan (Delhi)[14]
N	422	224	21	235	144
Duration of study	31 / 3 / 2020 to 20 / 6 / 2020	1 / 5 / 2020 to 31 / 5 / 2020	1 / 2 / 2020 to 19 / 3 / 2020	11 / 5 / 2020 to 18 / 6 / 2020	23 / 3 / 2020 to 15 / 4 / 2020
Age	34.1 years		40.3 years	50.7 years	40.1 years
Gender					
Male	242 (57.5 %)	126 (56.2 %)	14 (66.7 %)	160 (68.1 %)	134 (93.1)
Female	180 (42.5 %)	98 (43.7 %)	7 (33.3 %)	75 (31.9 % %)	10 (6.9 %)
M:F ratio	1.34	1.28	2.0	2.13	13.4
History of travel / multiple exposure	53 (12.6 %)	42 (18.7 %)	13 (61.9 %)		111 (77.1 %)
Symptoms (N)	127 (30 %)	59 (26.3 %)	12 (57.1 %)	235 (100 %)	80 (55.6 %)
Fever	98 (77 %)	35 (59.3 %)	9 (75 %)	160 (68.1 %)	25 (31.2 %)
Cough	85 (66 %)	48 (81.3 %)	9 (75 %)	140 (59.5 %)	50 (62.5 %)
Breathlessness	51 (45.6 %)	29 (49.15 %)	1 (8.3 %)	168 (71.9 %)	8 (10 %)
Sore throat	23 (18.1 %)		5 (41.6 %)		31 (38.7 %)
Myalgia		30 (50.84 %)	3 (25 %)		
Loss of smell	33 (26 %)				
Loss of taste	30 (23 %)				
Diarrhoea / GI		11 (18.64 %)		29 (12.3 %)	4 (5 %)
Asymptomatic	295 (69.9 %)	165 (73.6 %)	9 (42.9 %)		64 (44.4 %)

Table 6. Comparison of This Study with Other Studies Based on Clinico-Demographic Factors

CO-Morbidities and Mortality Among Covid-19 Patients					
	Our Study	Mahesh Dave[8]	Nitesh Gupta[7]	Choro[13]	Anant Mohan[14]
N	422	224	21	235	144
DM	28 (6.63 %)	28 (12.5 %)	3 (14.2 %)	54 (23.3 %)	16 (11.1 %)
HTN	22 (5.2 %)	40 (17.85 %)	5 (23.8 %)	65 (28.1 %)	3 (2.1 %)
IHD	2 (0.47 %)	20 (8.9 %)		13 (5.5 %)	1 (0.7 %)
Respiratory	36 (18.53 %)	38 (16.9 %)	1 (4.7 %)	5 (2.21 %)	4 (2.8 %)
CKD		7 (3.12 %)		220 (9.5 %)	
CVA					
Pregnancy	13 (3.08 %)				
Malignancy	2 (0.47 %)	3 (1.3 %)		26 (11 %)	
Others	11 (0.47 %)		3 (14.2 %)	10 (4.4 %)	4 (2.8 %)
Mortality	16 (3.8 %)	5 (2.23 %)		19 (37.5 %)	2 (1.4 %)

Table 7. Comparison of Co-Morbidities and Mortality among Various Studies

CONCLUSIONS

As the outbreak progresses with extensive facilities for diagnosis, more symptom awareness, there is observed shift in rise of asymptomatic cases. Loss of smell has become important in the symptomatology of Covid-19 cases. Co-morbidities and chest radiograph abnormalities play an important role in conversion rates as well mortality. There may be some regional variations in symptoms and co-morbidities.

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