Original Research Article

Profile of COVID-19 patients in COVID dedicated tertiary care centre in Himachal Pradesh: a prospective observational cross sectional study

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ABSTRACT

Background: COVID-19 pandemic originated in China in December 2019 and fumed in whole world over few months. Millions of deaths have occurred worldwide till now because of this pandemic. Causative agent was identified as severe acute respiratory syndrome corona virus 2 (SARS-CoV-2) causing viral pneumonia and serious manifestations were seen in association with increased age and comorbidies.
Methods: This study was planned in very initial stage of pandemic in our country to study the profile of COVID-19 patients. This study was conducted over a period of six months from April 2020 to September 2020 at SLBSGMCH, Mandi at Nerchowk.
Results: 202 patients were enrolled for this study with mean age of presentation 48 years, 61 were females, 147 (72%) were senior citizens, most patients were from district Mandi and most common symptoms were fever (58%), cough (46%), shortness of breath (35%) and associated commonest comorbidities were hypertension (HTN) (29%) and diabetes (23%). Median neutrophil to lymphocyte ratio (NLR) was higher (5.47) in moderate to severe disease and associated with poor outcome. All the 11 patients who were put on support of ventilator, succumbed to death.
Conclusions: Most common symptoms were fever, cough, shortness of breath and most common comorbidty was HTN. Comorbidity, increased age and higher NLR were risk factors for severity and poor outcome. More research is needed to save mankind from this pandemic as still no specific therapy is available against this virus.

Keywords: Corona virus disease, Rapid antigen test, Real time polymerized chain reaction

INTRODUCTION

COVID-19 disease was first reported from Wuhan city, Hubei Province, China in December 2019.[1] On 31 December 2019 Wuhan municipal health commission confirms a disease outbreak with 29 cases. By January 2020 genomic sequence of the virus was shared with World Health Organization (WHO) by China, subsequently human to human transmission was confirmed. Since the epidemic escalated and rapidly fumed around the world in a short span of time, on 30 January 2020 epidemic was declared as public health emergency of international concern.[2] India reported first case on 30 January 2020 followed by lockdown to contain

this epidemic, but the number of cases kept on surging. Similar was the status of this hilly state Himachal Pradesh. Initially there were very few cases in this state but as the epidemic progressed in rest of the country the number of cases surged in this state also. SLBSGMCH, Mandi was declared as first COVID dedicated tertiary care centre in Himachal so initially all the positive cases were referred to this hospital from various districts. So this study was planned to look for demographic, clinical, biochemical profile of COVID-19 patients in this hilly state.

Corona viruses are large family of enveloped ribonucleic acid (RNA) viruses with a capability to infect a wide range of hosts. Severe acute respiratory syndrome corona virus-

2 (SARS-CoV-2) belongs to the *Sarbecovirus* subgenus of the *Coronaviridae* family. Out of these 7 have capability to infect humans. These can cause various diseases like common cold, severe acute respiratory syndrome (SARS), and Middle East respiratory syndrome (MERS) in humans.[3] Incubation period is variable and estimated to be 1-14 days, with a median of 4 to 7 days. About 97.5% of patients develop symptoms within 11.5 days of infection.[4] In China, 87% of confirmed cases were aged 30 to 79 years and 3% were aged 80 years or older. Approximately 51% of patients were male.[5] Children are less affected in comparison to adults.

Objective

This study was planned in very initial stage of pandemic in our country to study the profile of COVID-19 patients.

METHODS

It was a prospective observational cross sectional study conducted over a period of 6 months from April 2020 to September 2020 at SLBSGMCH Mandi at Nerchowk in department of medicine.

Inclusion criteria

Patients those who were tested positive for COVID-19, were aged more than 18 years and were willing to take part in study were included.

Exclusion criteria

Patients aged below 18 years and not giving consent for participating in study were excluded. Ethical approval was taken from ethics clearance committee of college. Patients were either real time polymerized chain reaction (RTPCR) or rapid antigen test (RAT) positive for SARS-CoV-2. Epidemiological, clinical history, laboratory data, treatment done, treatment outcome data was collected on preformed proforma from the records of patients admitted in COVID dedicated tertiary care centre at SLBSGMCH and analyzed on Microsoft excel spreadsheet. Patients were categorized as asymptomatic, mild (SpO$_2$ >93% and symptomatic), moderate (SpO$_2$ 90-93% or respiratory rate 24-30/minute) and severe (SpO$_2$ <90% or respiratory rate >30/minute) or critical illness if systolic blood pressure (SBP) <90 mm of Hg.

RESULTS

Total 202 patients were admitted during study period with median age of presentation 48 years, out of them 61 (30%) were females. Most elderly patient was 92 years old and youngest was 20 years old. 147 (72%) patients were senior citizens. 196 patients were from Himachal and 6 were from other states. Maximum patients 114 (56%) were from district Mandi followed by Hamirpur 26 (12%), Bilaspur 24 (11%), Una 6, Kangra 3, Chamba 4, Solan and Lahaul Spiti 1 each.

Table 1: District wise distribution (n=202).

District	N (%)
Mandi	114 (56)
Hamirpur	26 (12)
Bilaspur	24 (11)
Una	6 (2.9)
Kangra	3 (1.4)
Chamba	4 (1.9)
Solan	1 (0.4)
Lahaul and Spiti	1 (0.4)

Table 2: Distribution of symptoms (n=202).

Symptoms	N (%)
Cough	93 (46)
Fever	119 (58)
Shortness of breath	71 (35)
Sore throat	33 (16)
Chest pain	7 (3)
Fatigue	30 (14)
Headache	6 (2)
Lose stools	4 (1)
Myalgia	1 (4)
Anosmia	4 (1)
Dysgeussia	6 (2)
Pain abdomen	4 (1)

45 patients had history of visit to redzones declared by the government and out of them 26 patients had history of contact with COVID-19 patients, median time to turn positive after history of contact was 7.88 days in these patients, with minimum 4 days and maximum 13 days to turn positive after contact. 5 health care workers were also admitted during study period, 4 had history of hydroxychloroquine prophylaxis and all had gone through electrocardiography (ECG) before taking prophylaxis. None had history of arrhythmias post prophylaxis. 82 (40%) patients had one or more co morbidities. While hypertension (HTN) was present in 29% of the patients.

Table 3: Distribution of comorbidities (n=202).

Comorbidities	N	%
HTN	59	29
Diabetes mellitus (DM)	47	23
Chronic kidney disease (CKD)	10	4
Tuberculosis (TB)	6	2.9
Coronary artery disease	8	3.9
Carcinoma	2	0.9
Chronic lung disease	4	1.9
On immunosuppressive drugs	1	0.5

Quick sepsis-related organ failure assessment score (qSOFA) score was raised in only two patients. 164 (81%) patients were tested RTPCR positive and 38 (19%) RAT positive. Average time to turn RTPCR negative in 77

patients was 10 days, later on follow up testing was abandoned. 28 (13.8%) patients were in severe category, 43 (21.2%) moderate, 119 (58.9%) mild category and 12 (5.9%) were asymptomatic. Average hospital stay of these patients was 9.4 days while maximum stay was till 29 days.

Table 4: Severity wise distribution (n=202).

Category	N (%)
Asymptomatic	12 (5.9)
Mild	119 (58.9)
Moderate	43 (21.2)
Severe	28 (13.8)

Median neutropil to lymphocyte ratio (NLR) in mild/asymptomatic category was 2.87, moderate and severe category was 5.47. NLR was 5.69 in category of patients who died. C reactive protein (CRP) was tested in five patients out of them 2 patients had normal CRP, two had >1 and 1 had 0.5-1. Ferritin was tested in 6 patients and out of them 2 patients had ferritin >1000, 4 had 500-1000. Lactate dehydrogenase (LDH) was tested in 5 patients out of them 1 had >1000, 3 had 250-1000 and one had normal LDH level. Out of 186 patients 122 had normal chest X-ray while 47 (23%) had bilateral and 17 (8%) had unilateral involvement.

Treatment was given as per national guidelines and which kept on changing time to time. 3patients were put on high flow nasal canula (HFNC), 4 on continuous positive airway pressure (CPAP) and 11 (5.4%) on mechanical ventilation. All of the patients put on mechanical ventilation succumbed to death.

Treatment outcome

Total 14 (6.93%) patients died, out of them 8 were aged >60 years rest 6 were 30-60 years age group. Remaining all were discharged from hospital. 8 cases were antenatal cases.

Table 5: Distribution of treatment given (n=202).

Treatment given	N
Hydroxy chloroquine	48
Ivermectin	107
Remdesivir	30
Dexamethasone	53
Enoxaparin	54
Azithromycin	62
Piperacilline	33
Favipiravir	6
Meropenem	2
Ceftriaxone	37
Doxycycline	49
Hemodialysis	10

Out of 8 antenatal cases 5 had normal vaginal delivery at term while one was preterm, two were managed as emergency caesarean section. All the newborns were tested negative.

10 patients were managed with hemodialysis and out them 4 died during hospital stay while others were discharged.

DISCUSSION

This study was planned when there were no cases of COVID-19 in the state. As first four cases were detected in the month of April 2020, despite being asymptomatic they were shifted to our centre. Although later on as guidelines changed, no asymptomatic cases were shifted from other districts to our centre. Out of 202 patients admitted in this centre, 142 (72%) were senior citizens and median age of presentation was 48 years. Most patients were senior citizens as in first wave mostly elderly people were symptomatic. 141 (69.8%) patients were males. Most patients were from home district as the cases of even mild category from home district were also admitted in this hospital, while in other districts only cases with moderate to severe category were referred to our hospital. Another study published in Indian Journal of Medical Research from a hospital in India where 235 patients were enrolled, median age was 50.7±15.1 years while, 68% were males in this study group. Fever (68%), cough (59%) and shortness of breath (71%) were most common presenting symptoms.[7] Zhang and colleagues reported data of 194 cases of COVID-19 in Huanggang, China with 108 male patients with median age of 48.3 years. Clinical features of these patients were fever sore throat, cough in 146 (75.26%) cases, 98 (50.52%) and 86 (44.33%) cases respectively. 30 (15.46%) patients had liver dysfunction, on imaging 141 (72.68%) patients had abnormal density shadow in the lung parenchyma.[8] While in our study fever (58%), cough (46%) and shortness of breath (35%) were the commonest symptoms. Frequency of other symptoms is shown in the Table 2.

40 percent patients had one or more comorbidities while HTN was most common comorbidity. By the time of completion of study pandemic was at peak in our state. A study of 1591 patients published from Italy in 2020 reported median age of 63 years, while 82% being males and 68 percent having at least one comorbidity and most common comorbidity was hypertension.[6] In our study also most admitted patients were males, most were above 60 years and most common comorbidity was HTN (Table 3). A study published in Indian Journal of Medical Research from a hospital in India, HTN (28%) followed by DM (23%) were most common comorbidities like in our study HTN (29%) was most common comorbidity followed by DM (23%).[7] Out of 14 deaths 7 had 2 comorbidities, 4 had 3 comorbidities and 3 had one comorbidity. The patients with more number of comorbidities had more severe disease.

Average hospital stay of these patients was 9.4 days while maximum stay was till 29 days. Initially as per guidelines patients were to be discharged unless they were tested RTPCR negative and hence their stay in hospital was longer. Later as the national guidelines changed and we started discharging the patients once they were stable and off supportive oxygen therapy so the hospital stay reduced.

45 patients had history of visit to redzones declared by the government and out of them 26 patients had history of contact with COVID-19 patients, median time to turn positive after history of contact was 7 days, with minimum 4 days and maximum 13 days to become positive after contact. Evidence suggests that most people test positive between 5-7 days after exposure and least within 3 days of exposure. But in our study there was variability in reporting of patients for testing as they delayed it because of fear of testing positive and social out casting. Median time to turn RTPCR negative in 77 patients was 10 days, later on follow up testing was abandoned. Mean duration to test negative on follow up testing was 8.3 days in research conducted by Bhandari et al.[9] Time to turn RTPCR negative was 18 days in another study conducted by Kayina and team in a tertiary care hospital in India.[7]

4 out of 5 admitted healthcare workers had taken hydroxychloroquine prophylaxis, with small sample size it is difficult to predict the failure of prophylaxis. 28 (13.8%) patients were in severe category, 43 (21.2%) moderate, 119 (58.9%) mild category and 12 (5%) were asymptomatic in our study. In research by Kayina et al out of 235 patients' mild, moderate, severe and critical illness were 18.3, 32.3, 31.1 and 18.3% respectively.[7]

A study published in international journal of antimicrobial agents suggests that NLR of >4 was a predictor of severity and ICU admission.[10] Similarly in our study median NLR of 5.47 was associated with moderate to severe category and 5.69 in patients without come as death in comparison to median NLR of 2.87 in mild/asymptomatic category. Out of 186 patients 122 had normal chest x ray while 47 had bilateral and 17 had unilateral involvement. Inflammatory markers were tested in 6 patients out them 2 patients died in whom markers were raised significantly. In initial phase of the study the facility of inflammatory markers was not available in the institute hence these markers could be tested only in 6 patients.

Treatment was given as per national guidelines and which kept on changing time to time. 48 patients were given hydroxychloroquine out of them one patient died later on. 107 patients were given ivermectin, remdesivir to 30 patients, dexamethasone and enoxaparine to 54 patients, azithromycin to 64 patients, piperacilline tazobactum to 33, meropenem to 2, favipiravir to 6 patients, doxycycline to 49 and ceftriaxone to 37 patients. Dexamethasone and enoxaparine were given to 54 patients of moderate to severe category, out of them 7 died and rest all were discharged from hospital while out of rest of 17 patients of moderate to severe category who did not receive dexamethasone and enoxaparine 7 patients died.

4 patients were put on HFNC all died, 4 on CPAP 2 out of them survived, and 11 patients were managed with invasive mechanical ventilation. Attendants of remaining 3 patients refused to give consent for invasive mechanical ventilation. All four patients who were put on HFNC were later put on invasive mechanical ventilation. All of the patients put on mechanical ventilation succumbed to death. A study conducted by King et al reported a death rate of 42.7% in mechanically ventilated patients.[13] Death rate in a study conducted by Shukla et al mentions death rate of 3% in their study while death rate in our study was 6.9%.[11] 8 patients were >60 years old and 6 patients were aged 30-60 years group in our study while in USA reports described outcome in aged >85 years 10-27%, 3-11% among aged 65-84 years, 1-3% among aged 55-64 years, <1% in aged 20-54 years.[12]

Limitations

Limitation of the study was that it was conducted in initial phase of the first wave COVID so less number of patients with severe category were available. Also guidelines regarding treatment, investigations and discharge of patients kept on changing with time so categorization of patients on the basis of treatment, investigations could not be done properly.

CONCLUSION

Most common symptoms were fever, cough, shortness of breath and most common comorbidity was HTN. Comorbidity, increased age and higher NLR were risk factors for severity and poor outcome. None of the patient put on support of ventilator survived. With myriad of presentations and no specific therapy available as treatment, more research is needed to save mankind from this pandemic.

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