



CLINICAL PROFILE OF COVID-19 INFECTED PATIENTS ADMITTED IN A TERTIARY CARE HOSPITAL IN NORTHWESTERN ZONE OF INDIA

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ABSTRACT

The ongoing COVID-19 pandemic, which started as series of unexplained pneumonitis in Wuhan, China has soon pushed the world in the abyss. It has caused huge loss in terms of life and property. India with more than billion population is becoming the new hotbed of the infection. This study was undertaken to evaluate the clinical profile, socio-demographic distribution, risk factors and complications in COVID-19 positive patients in Northwestern Rajasthan. This is a cross-sectional study, done at the Department of medicine SP Medical College, Bikaner, Rajasthan. 129 COVID-19 positive patients were part of the study out of which 75 (58.13%) were male. The average age was only 34.7 years. The mean duration of stay was 9.5 days and was significantly more in patients with co-morbidities. Initial group of patients had only travel history, but later the majority of patients had contact history with COVID-19 positive case. 89 (68.9%) patients were completely asymptomatic and out of 40 symptomatic patients, fever was the commonest symptom (72.5%) followed by cough (67.5%) and breathlessness (30%). 21 patients (16.2%) had co-morbidities most common being Type 2 Diabetes and Hypertension. Out of 7 patients who died, 6 had one or multiple co-morbidities. X-ray changes were present in only 6.2% patients. The mean CBC parameters were normal. Leucocytosis and granulocytosis was associated with more ICU admission and adverse outcome. Mean SGOT and SGPT were deranged. The relationship between NLR and severity of disease was found to be statistically significant. The early diagnosis of COVID-19 cases and early prediction of adverse outcome will help physicians to optimally utilise the limited resources.

INTRODUCTION

The COVID-19 pandemic, is an ongoing pandemic of coronavirus disease 2019, caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2).^[1] On 31 December 2019, health authorities in China reported to the World Health Organization (WHO) a cluster of viral pneumonia cases of unknown cause in Wuhan, Hubei Province, and an investigation was launched in early January 2020. Several of the early cases had visited Huanan Seafood Wholesale Market and so the virus is thought to have a zoonotic origin. The virus that caused the outbreak is known as SARS-CoV-2, a newly discovered virus closely related to bat coronaviruses, pangolin coronaviruses, and SARS-CoV. The scientific consensus is that the virus has a natural origin. The probable bat-to-human infection may have been among people processing bat carcasses and guano in the production of traditional Chinese medicines. The

World Health Organization declared the outbreak a Public Health Emergency of International Concern on 30 January, and a pandemic on 11 March.^[2] As of 24th June 2020, more than 9.23 million cases of COVID-19 have been reported in more than 188 countries and territories, resulting in more than 476,000 deaths.^[3] The first case of the COVID-19 in India was reported on 30 January 2020, originating from China. As of 24th June 2020, the Ministry of Health and Family Welfare have confirmed a total of 4,65,553 cases, 2,58,684 recoveries and 14,476 deaths in the country.^[4] This could be an underestimate due to the lower number of diagnostic tests and case identification partly due to poor health services in most countries. The mortality rate stands at 0.5-4.4%. However, this could be an overestimate as the exact denominator of the actual number of cases is underreported. A lot of research has been undertaken to develop a vaccine, but with little chance of success in the

foreseeable future. The incubation period of COVID-19 is thought to be up to 14 days following exposure.^[5,6,7] The principal presenting features of COVID-19 are fever, cough, dyspnea, and bilateral infiltrates on chest imaging.^[8,9] Approximately 20% of patients progress to multi-organ dysfunction (including respiratory failure, septic shock, acute cardiac injury, or acute renal failure).^[8,9,10] However, a complete picture of the clinical course of COVID-19 has not been described thoroughly.^[11] Except for infection control and supportive therapy, there is no specific therapy of COVID-19. Multiple organ support therapy is the cornerstone in the treatment of critically ill patients with COVID-19.^[10,11] Early recognition of risk factors for death would be useful to identify those potentially needing critical care at an early stage. Accordingly, a study was conducted to evaluate the clinical profile of COVID-19 positive patients.

STUDY DESIGN

All consecutive patients with confirmed Covid-19 infection admitted to PBM Hospital, Bikaner from 1st March upto submission of paper, were enrolled. Oral consent was obtained from patients. The clinical outcomes (i.e, discharges, mortality, and length of stay) were monitored upto submission of paper.

DATA COLLECTION

The medical records of patients were analyzed by the research team of the Department of Medicine, PBM Hospital, Bikaner. Epidemiological, clinical, laboratory, and radiological characteristics and treatment and outcomes data were obtained with data collection forms from electronic medical records and history given by patients. All data was reviewed by internal medicine specialists. Information recorded included demographic

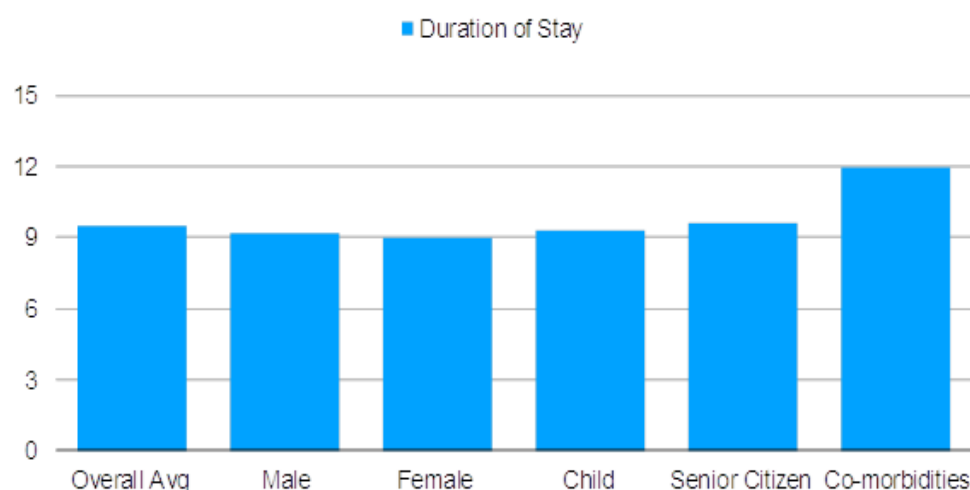
data, medical history, exposure history, underlying comorbidities, symptoms, signs, laboratory findings; chest computed tomographic (CT) scans, and treatment measures (antiviral therapy, Anti-retroviral therapy, anti-malarial therapy, respiratory support). Berlin definition was used to define ARDS.

SAMPLE COLLECTION AND ANALYSIS

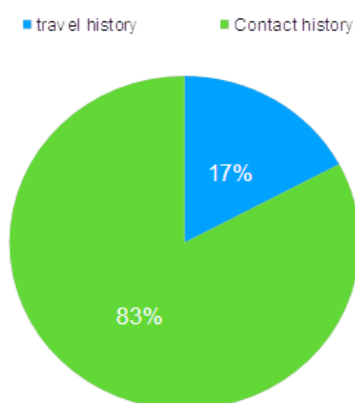
Throat swab samples were collected for extracting 2019-nCoV RNA from patients suspected of having 2019-nCoV infection and were placed into a collection tube containing virus transport medium (VTM) for extraction of total RNA. This process was tried to be completed in minimum possible time. Optimum amount of cell lysates were transferred into a collection tube and were later centrifugated. The suspension was used for RT-PCR assay of 2019-nCoV RNA. This diagnostic criterion was based on the recommendation by the National Institute of Virology (Pune).

RESULTS

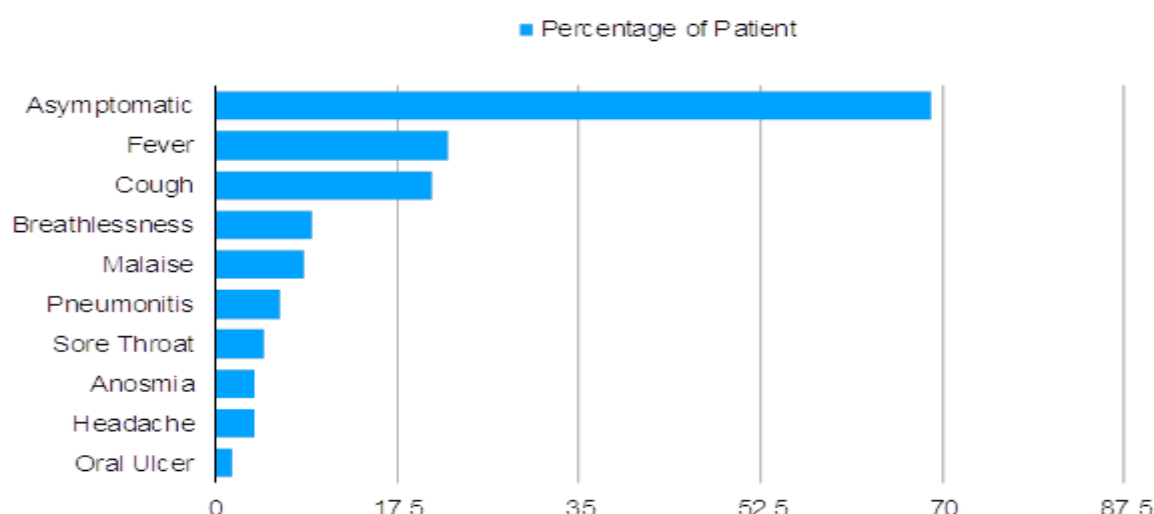
1. 129 consecutive lab confirmed COVID-19 positive patients were included in the study, out of which 75 (58.13%) were Male and 54 (41.8%) were Female. Around 115 (89.1%) were adults and 14 (10.8%) were children. The average age was 34.7 yrs (3-85yrs) and was almost similar for both male (35.9 yrs) and female (33.6 yrs).
2. The average duration of stay from 1st confirmed positive report to first negative report was around 9.5 days. The average duration of stay was 9.2 days for male, 9 days for female, 9.3 days for child, 9.6 days for senior citizens and 12 days for patients with co-morbidities.



3. Out of 129 patients only 22 (17.05%) had travel history while the rest 107 (82.9%) patients had history of contact with some COVID-19 positive patients.

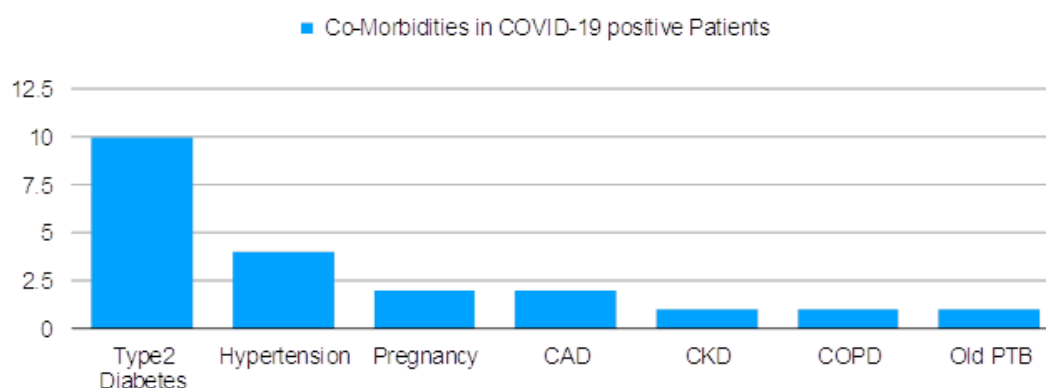


4. Out of all COVID-19 positive patients 89 (68.9%) were completely asymptomatic while 40 (31%) patients had symptoms, fever being the commonest in 29 (72.5%) patients followed by cough 27 (67.5%), breathlessness 12 (30%), malaise 11 (25%), pneumonitis 8 (20%), sore throat 6 (15%), Anosmia 5 (12.5%), Headache 5 (12.5%) and oral ulcer 2 (5%).



5. 77 (59.6 %) patients were discharged after 2 negative COVID-19 reports and 7 (5.4%) succumbed to the disease.
6. 21 (16.2%) patients had one or more co-morbid conditions. 10 (47.6%) patients had history of Type 2 Diabetes, 4 patients (19%) had

hypertension, 2 patients were pregnant female and 2 had history Coronary Artery Disease and CABG (Coronary Artery Bypass Graft). There was 1 patient each with history of CKD (Chronic Kidney Disease), COPD (Chronic Obstructive Pulmonary Disease) and old treated pulmonary tuberculosis.



7. Mean age of patients with co-morbidities was 55.6 yrs (26 - 85 yrs). Out of 21 patients with co-morbidities, 10 (47.6%) were male and 11 (52.3%) were female. 8 (38.05%) had to be shifted to ICU for management and 6 (28.5%) died during treatment. In patients with co-morbidities, fever

and cough were present in 10 (47.6%) and 9 (42.8%) patients respectively breathlessness was present in 9 (42.8%) patients while 7 (33%) patients had pneumonitic changes. Average duration of stay for patients with co-morbidities was around 12.2 days.

8. Out of 129 patients X-Ray changes were present in 8 (6.2%) patients and only 6 (4.6%) patients had classical Bilateral pneumonitis changes at baseline. The serial X-Ray of patients with pneumonitis revealed gradual increase of ground glass appearance and emergence of bilateral consolidate picture.
9. The complete blood count reports of 129 patients were analysed, the mean total leucocyte count was $6.71 \pm 4 \times 10^3$, lymphocyte count $2.5 \pm 0.9 \times 10^3$, monocyte count $0.32 \pm 0.5 \times 10^3$, granulocyte count $3.8 \pm 3.2 \times 10^3$, Platelet count $223.6 \pm 85 \times 10^3$ and MPV was 7.06 ± 1.8 . Leucocytosis was present in 12 (9.3%) patients while Leucocytopenia was present in 20 (15.6%) patients. Leucocytosis and granulocytosis was associated with more ICU admissions and adverse outcomes. 6 (85.7%) out of 7 patients who died had leucocytosis as well as granulocytosis. The mean total leucocyte count and granulocyte count in patients with adverse outcome was $16.5 \pm 9.1 \times 10^3$ and $12.5 \pm 7.3 \times 10^3$ respectively.
10. The biochemical profile of COVID-19 positive patients is mentioned in the Table below. While all the parameters were normal, the average SGOT and SGPT count were 86.9 ± 68.6 and 40.46 ± 31.4 respectively, which was slightly raised above normal.
11. The Neutrophil Leucocyte ratio (NLR) was 1.6, Platelet Lymphocyte Ratio (PLR) was 99.35 and Lymphocyte Monocyte Ratio (LMR) was 12.2. The NLR, PLR and LMR of patients who died were 3.65, 72.5 and 5.4 respectively.
12. The relationship between NLR and severity of disease was found to be statistically significant. Relationship between PLR and LMR with severity of disease was not statistically significant.

Table 1: Biochemical profile of COVID-19 positive patients.

BIOCHEMICAL PROFILE	COVID 19 POSITIVE CASES	COVID19 POSITIVE DEATH
RBS	97.3±54	178±60
UREA	28.4±15	71±18
CREATININE	1.07±0.5	3.8±1.2
T. PROTEIN	6.9±0.7	5.9±0.4
ALBUMIN	4.03±0.4	3.11±0.5
BILIRUBIN (T)	0.9±0.3	1.4±0.5
BILIRUBIN (D)	0.3±0.1	0.5±0.3
SGOT	86.9±68	61.1±34.7
SGPT	40.46±31	56.1±24.5
ALKALINE PO4	189.3±110	197.2±91
TOTAL CHOLESTROL	156±35	175.4±46.6
TG	114.8±34	134.2±45.3
VLDL	24.3±12	24.2±2.2

Table 2: TLC, DLC and Platelet count of COVID-19 positive patients.

COMPLETE BLOOD COUNT	COVID 19 POSITIVE CASES	COVID19 POSITIVE DEATH
TLC	6.71±4	16.5±7
LYMPHOCYTE	2.5±0.9	3.68±1.4
MONOCYTE	0.32±0.2	0.75±0.4
GRANULOCYTE	3.82±3.5	12.5±6.3
PLATELET COUNT	223.6±85	217±56.2
MPV	7.06±1.1	8±0.3

Table 3: Relationship Between NLR and severity of Disease.

	Patients without complications	Patients with complications (ICU and Death)
Mean NLR	1.6	3.65
SD	0.95	0.97

T Test 'p' value < 0.05 LS = S

Table 4: Relationship Between PLR and Severity of Disease.

	Patients without complications	Patients with complications (ICU and Death)
Mean PLR	102.2	507.9
SD	42.6	46.6

T Test 'p' value > 0.05 LS = NS

Table 5: Relationship Between LMR and Severity of Disease.

	Patients without complications	Patients with complications (ICU and Death)
Mean LMR	13.1	6.41
SD	0.95	0.87

T Test 'p' value > 0.05 LS = NS

DISCUSSION

COVID-19 pandemic, which started as a series of unexplained pneumonitis in Wuhan has within a matter of a few months, gripped the whole world, affecting millions of people and caused huge loss to life and livelihood. India is a developing country with a population of 1.25 billion is at particularly high risk, due to high poverty, poor hygiene, illiteracy and overcrowded conditions. Studies on COVID-19 have generally been limited to the description of the initial clinical, hematological, radiological, and microbiological findings. Herein, we describe the clinical features, socio-demographic parameters and poor prognostic factors in virologically confirmed COVID-19. In this study, we enrolled 129 lab confirmed COVID19 positive patients, including 75 male (54.1%), median age was 34.5 years, which was considerably lower compared to the study done by Wang et al where median age was 51 years and Bhandari et al where the median age was 43.5 years.^[12,13]

The mean duration of stay was found to be lower compared to both the study.^[12,13] The majority of patients (82.9%) had a history of contact with a COVID-19 positive case compared to study by Bhandari et al, where the majority of patients (71.42%) had a history of travel to another country.^[13] Only 40 (31%) patients had symptoms and rest 89 (79%) were asymptomatic, diagnosed due to active screening of the contacts of COVID19 patients. The most common symptom encountered in decreasing order of frequency were fever, cough and breathlessness, similar to other studies, however, decreased in frequency.^[12,13,14] The incidence of Anosmia and altered taste was 5 (12.5%) compared to studies done by Jan C Luers et al and Spinato G et al where incidence of anosmia was as high as 64.4%.^[15,16] 21 (16.4%) patients had one or multiple co-morbidities,

most common being Diabetes 10 (47.6%) and hypertension 4 (19%). Average age of patients with co-morbidities was 55.6 years, 8/21 (38%) had to be shifted to ICU and 6/21 (28.5%) died during treatment. The incidence of fever and cough were lower in patients with complications compared to those without complication while the incidence of breathlessness and pneumonitis were higher. X Ray changes were present in only 8 (6.2%) patients and only 6 (4.6%) had classical bilateral pneumonitis. This is in contrast to other studies such as by Wang D et al and Guan WJ et al where pneumonic changes were present predominantly.^[14,17] This may be due to active screening by health authorities and admission of every case of lab confirmed COVID-19 positive, irrespective of their health status. Asymptomatic and mild-moderately sick patients had absolutely normal complete blood count, renal function test and hepatic function test except ALT and AST which were deranged about 2 times in these patients while in a study done by wang et al and Bhandari et al lymphopenia was commonly encountered.^[12,13,14] In severely sick patients Leucocytosis and Neutrophilia were present, but Thrombocytopenia was not observed. These patients had deranged renal and hepatic functions and signs of multi organ dysfunction later leading to death. The relationship between NLR with severity of disease was found to be statistically significant as also confirmed in a study by Yang A et al.^[19]

CONCLUSION

This study showed a variable range of presentation. Asymptomatic patients during the course of disease despite being Covid-19 positive pose a great epidemiological risk to the society as they can spread the infection unrestrictedly and shall be strictly isolated. Old

age, female gender, co-morbidities were associated with increased mortality. Such patients should be very closely monitored and thoroughly evaluated. NLR can be used for prognosis and planning management.

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