International Journal of Health and Clinical Research, 2020;3(11):136-141 e-ISSN: 2590-3241, p-ISSN: 2590-325X

Original Research Article

A clinical experience of COVID-19 patients in tertiary care center

P.Vijayendra Raju[1], C Rajesh Reddy[2*]

[1]Assistant Professor, Department of Pulmonology, Mahavir Institute of Medical Sciences,Vikarabad, Telangana, India
[2]Assistant Professor, Department of Pulmonology, Narayana Medical College and Hospital,Nellore, Andhra Pradesh, India

Received: 17-10-2020 / Revised: 11-11-2020 / Accepted: 04-12-2020

Abstract

Background: The pandemic of COVID-19 has emerged as a global public health emergency impacting health systems across the globe. Epidemiological and epidemiological research is important. Clinical features of patients in various parts of our country with COVID-19. This study highlights clinical experience at a tertiary care centre in South India in systemic manifestations of COVID-19 patients.**Materials and methods:**The current study is a retrospective observational study of epidemiological features and clinical manifestations of 130 COVID-19 positive patients who presented themselves to this centre during the outbreak from July, to September 2020 in a tertiary care centre. **Results:** During the study period, 134 patients with SARS-CoV-2 infection were admitted. Patients of age 31-50 years males are most common group effected in study. Most of the patients had raise of IL-6 with 95% followed by Hyperferritinemia 93%, Increased D-dimer 90% and Hypoxemia 80%.Most of the patients with covid 19 suffered from secondary infection 20 patients (15%) followed by AKI and metabolic acidosis 10 cases each (7.7%).Thrombotic complications in ICU despite of anticoagulants are present in 7 patients(5.3%). 6.15% is the mortality rate with reinfection in one case. Guillain-Barre syndrome in 2(1.5%) cases. **Conclusion:**The COVID-19 pandemic is an example of a multi-systemic infectious disease requiring early cooperation, especially in India, with various clinical specialties to reduce the burden of the disease.

Keywords: Covid -19, Systemic manifestations, Hyperferritinemia.

This is an Open Access article that uses a fund-ing model which does not charge readers or their institutions for access and distributed under the terms of the Creative Commons Attribution License (http://creativecommons.org/licenses/by/4.0) and the Budapest Open Access Initiative (http://www.budapestopenaccessinitiative.org/read), which permit unrestricted use, distribution, and reproduction in any medium, provided original work is properly credited.

Introduction

Since March 2020, respiratory tract infection cases caused by virus occurred in all parts of India around 1.25 lakh deaths by November [1].Disease had rapidly spread from kerala to all over the india and to many other countries [2]. Novel coronavirus was identified by the National Center for Disease Control (NDC), and was subsequently named as severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2; previously known as 2019-nCoV) by WHO, and pneumonia caused by 2019-nCoV was named COVID-19 .

**Correspondence*
Dr. C Rajesh Reddy
Assistant Professor,
Department of Pulmonology,Narayana Medical College and Hospital, Nellore, Andhra Pradesh, India
E-mail: drrajeshreddy@gmail.com

The emerging virus was rapidly characterized as a novel member of the coronavirus family[2].Although most human coronavirus infections are mild, the epidemics of the severe acute respiratory syndrome coronavirus (SARS-CoV) and Middle East respiratory syndrome coronavirus (MERS-CoV), have caused more than 10000 cumulative cases in the past two decades, with mortality rates of 10% for SARS-CoV and 37% for MERS-CoV. The current outbreak was initially noticed in a seafood market in Wuhan city in Hubei Province of China on 12th December, 2019 and has spread across China and many countries.[3] Human-to-human transmission via droplets as well as through contact with fomites seems to be the critical 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 internationally. Nevertheless, even though the virus is causing mild disease in many, the

course of illness may be severe, leading to hospitalization and even death in elderly or those with comorbid conditions Clinical manifestations caused by SARS-CoV-2 varied, encompassing asymptomatic infection, pneumonia, acute respiratory distress syndrome (ARDS) and even death[4]. The mortality of patients with severe illness is extremely high[5]. However, risk factors leading to deterioration and poor outcome in severe COVID-19 patients have not been well described. In the present study, the clinical data of 130 COVID-19 patients admitted in tertiary care center in special ward in Infectious Disease Hospital (discharge or death) were collected to analyze the clinical features and potential predictors for deterioration and/or death in COVID-19 patients.

Materials and methods

The current study is a retrospective observational study of epidemiological features and clinical manifestations of COVID-19 positive patients who presented themselves to this centre during the outbreak from July 29, 2020, to September 28, 2020 in a tertiary care centre.

A total of 130 adult (18–94 years) patients with confirmed COVID-19 from Infectious Disease Hospital were enrolled. All patients with confirmed COVID-19 enrolled in this study were diagnosed according to World Health Organization (WHO) interim guidance[10]. This study was approved by theInstitutional Review Board of hospital . Informed consents were waived from study participants. According to safety standards, in the presence of a suspicious case at our centre,Precautionary steps, including medical PPE, are taken by nursing workers. Foreign travellers were put in quarantine facilities and their contacts. According to a checklist standardised by MoHFW [4], the isolation facility at our hospital was tested for preparedness. Both health care staff who care for infected patients have undergone rigorous training and shown expertise in the field of health care. The application of policies and procedures for infection prevention. The nasopharyngeal and oropharyngeal swabs were tested for COVID-19 detection using quantitative polymerase chain reaction for confirmation at the National Centre for Disease Control (NCDC).

Inclusion criteria

Patients were confirmed and diagnosed with RT-PCR as suggested by WHO, raw data for clinical, radiological and laboratory findings and outcomes were addressed.

Exclusion criteria

Insufficient information about patients' characteristics and outcomes.

After admission, the resident physicians collected participants' sociodemographic, epidemiological, and clinical data and provided examinations and treatment. The patients were evaluated and clinically classified according to their disease progression. Patients with severe and critical illness were admitted to the intensive care unit, while those with mild and moderate illness were treated in the general ward. Furthermore, the following data were also collected at the time of discharge: clinical, laboratory, and imaging data as well as information on disease progression. Routine blood examinations were complete blood count, coagulation profile, serum biochemical tests (including renal and liver function, creatine kinase, lactate dehydrogenase, and electrolytes), interleukin-6 (IL-6), serum ferritin, and d dimer, Chest radiographs or CT scan were also done for all inpatients. Frequency of examinations was determined by the treating physician. Real-Time Reverse Transcription Polymerase Chain Reaction (RT-PCR) Assay for Covid-19: 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-nCoVRNA. This diagnostic criterion was based on the recommendation by the National Institute of Virology (Pune). All the extracted quantitative data were administered in Microsoft excel along with the relevant variables mentioned. Data analysis was performed by SPSS version 23. Analysis of socio-demographic variables as well as variables related to COVID-19 screening services was expressed using descriptive statistics like mean, median, proportion and relevant graphical presentation. Personal identifiers for the patients were removed from the data set after data extraction to maintain privacy and confidentiality.

Results

Total 130 patients participated in study with following data.

Table 1: Demographic details in COVID 19 patients

Patient characteristics	Number of patients	Percentages
Age intervals in year		
18-30	2	1.5
31-50	37	28.5
51-70	62	47.7
>71	29	22.3
Gender		
Males	78	60
Females	52	40

Patients of age 31-50 years males are most common group effected in study .

Table 2: Laboratory findings in present study

Lab parameters	Number of patients	Percentages
Increased C reactive protein	78	60%
Increased D-Dimer	117	90%
Increased IL-6	123	95%
Hyperferritinemia	121	93%
Lymphopenia and leucocytosis	78	60%
Thrombocytopenia	19	15%
Increased Sugars	91	70%
Hypoxemia	104	80%

Most of the patients had raise of IL-6 with 95% followed by Hyperferritinemia (93%, Increased D-dimer 90% and Hypoxemia 80%.

Table 3: Systemic manifestations in present study

Systemic manifestations	Number of patients	Percentages
Secondary infections	20	15
Thrombotic complications		
Acute myocardial infection	2	1.5
Acute limb ischemia	1	0.8
Stroke	2	1.5
Thalamic infract	1	0.8
Complete heart block	1	0.8
DVT	1	0.8
Liver manifestations		
Hepatitis	1	0.8
Transaminitis	7	5
Cirrhosis	4	3
CLD	4	3
Eye manifestations		
Eye conjunctivitis	6	4.6
Loss of vision	1	0.8
Lung manifestations		0
Mild pneumothorax	1	0.8
Pneumomediastinum	2	1.5
Surgical emphysema	1	0.8
Metabolic complications		0
DKA	2	1.5
Metabolic acidosis	10	7.7

Renal manifestations		0
Haematuria	2	1.5
AKI	10	7.7
GIT symptoms		
Diarrhoea Nausea Vomiting	4	3
Dermatological (erythematous rash and itching)	2	1.5
Scleroderma	1	0.8
DVT	1	0.8
COVID associated dengue fever	2	1.5

Most of the patients with covid 19 suffered from secondary infection 20 patients (15%) followed by AKI and metabolic acidosis 10 cases each (7.7%). Thrombotic complications in ICU despite of anticoagulants are present in 7 patients(5.3%).
Total in 130 patients 8 deaths ie 6.15% is the mortality rate.All the cases are seroconversion of +ve RTPCR to -ve RTPCR in 2-3 weeks in most of the cases. But 2 cases still positive after 8 weeks of treatment .RT-PCR -ve and CT positive in 20% (26 cases) of cases were mortality is high. Reinfection is observed in one case. Guillain-Barre syndrome in 2 (1.5%) cases. Average duration of admission stay in the hospital was 7 days ranging from 3 days to 24 days.

Discussion

In our study total 130 patients participated in study with most common effected age group as 31-50 years and males are more compared to females. Which is very much in agreement with study of Fei Zhou et al [6] study on191 inpatients (135 from Jinyintan Hospital and 56 from Wuhan Pulmonary Hospital) in which 54 patients died during hospitalisation and 137 were discharged. The median age of the 191 patients was 56·0 years (IQR 46·0–67·0), ranging from 18 years to 87 years, and most patients were male.In our study most of the patients had raise of IL-6 with 95% followed by Hyperferritinemia (93%, Increased D-dimer 90% and Hypoxemia 80%. Grifoni E et al[7] study showed in COVID-19 population that IL-6 levels at hospital admission seem to be a good prognosticator for the combined endpoint progression to severe disease and/or in-hospital mortality, and it seems to be the best prognosticator for negative outcome. An increased white blood count count, decreased lymphocyte /platelet count, high interleukin-6 and high serum ferritin levels were strong discriminators for severe disease.IL-6 is a strong predictor of respiratory failure[8]. During the energy producing metabolism that takes place in the cytoplasm of cells, glucose is transformed into pyruvate molecules generating 2 ATP molecules. During this glycolysis process, no oxygen is utilized. If the tissue oxygenation is regular, pyruvate molecules enters the mitochondria where they undergoes a series of enzymatic processes generating ATP, as well as CO_2 and H_2O molecules. In a situation of tissue hypoxia pyruvate molecules cannot enter the mitochondria but are converted to lactic acid and in this process ATP is released maintaining the energy production[9]. The lactic acid is removed mainly through the process of gluconeogenesis that takes place in the liver and kidney cortex, but also through the oxidation process in various organs.About 90% of inpatients with pneumonia had increased coagulation activity, marked by increased d-dimer concentrations. In this study, we found d-dimer increase is associated with fatal outcome of COVID-19. High levels of d-dimer have a reported association with 28-day mortality in patients with infection or sepsis identified in the emergency department.D-dimers are fragments produced when plasmin cleaves fibrin to break down clots. They are routinely used to exclude the diagnosis of thrombosis. However, plasma d-dimer increases by any pathologic or non-pathologic process that increases fibrin production or breakdown.A study conducted by Zhou et al[8] found increased d-dimer more is associated with mortality of COVID-19. High levels of d-dimer have been associated with 28-day mortality in patients with sepsis or infection identified in the emergency department[10]. Petrilli et al reported striking findings regarding the predictive value of inflammatory markers to distinguish future critical from non-critical illness. Early elevation in d-dimer level had the strongest association with prolonged hospitalization and the need for mechanical ventilation or death. Many studies have reported that d-dimer levels are associated with severity and clinical outcome of community-acquired pneumonia[12]. The other mechanisms include the pro-inflammatory cytokine responses that considered one of the mediators of

atherosclerosis disease that contribute to plaque rupture by the local inflammation, induce procoagulant factors, and haemodynamic changes, which trigger to thrombosis formation and ischemic diseases[13].In present study most of the patients with covid 19 suffered from secondary infection 20 patients (15%) which is nearly similar to study done by Marco Ripa et al[12] in 731 patients, secondary infection were diagnosed in 68 patients (9.3%). In our study AKI and metabolic acidosis is observed in 10 cases each (7.7%). Jose Portole´s et al [13] study showed In total 1603 cases 13% of those with AKI which high when compared to our study.In our study thrombotic complications are present in 7 patients(5.3%). In study done by Akshay Shah et al[15] 13.3% patients experienced thrombotic complications and reported incidence of thromboembolic compli-cations in ICU patients with COVID-19 ranges from 21 to 69%, but these data are predominantly from single-centre studies. The high burden of thrombotic complications in COVID-19, combined with data from other viral respiratory illnesses , has led to international clinical guidelines now recommending higher doses (intermediate dose) of thromboprophylaxis.In our study 6.15% is the mortality rate in total 130 patients. Mortality of 2.6 per cent (3 patients) was observed in Shiv Lal Soni et al [16] study and in Ramanan Laxminarayan, et al[17] Case fatality ratios spanned 0.05% at ages of 5 to 17 years to 16.6% at ages of 85 years .

Conclusion

The COVID-19 pandemic is an example of a multi-systemic infectious disease requiring early cooperation, especially in India, with various clinical specialties to reduce the burden of the disease. It is a highly contagious disease and has caused a high rate of mortality particularly in high risk individuals. Close monitoring and large-scale control strategies will be needed to prevent widespread transmission within the community.

Limitations

A small cohort characterises the sample size in the current analysis. It may be different with the propagation of the pandemic to different geographical areas, age groups and comorbid patients and thus these findings may be difficult to generalise at national or international level.

References

1. Hui DS, Azhar I, Madani TA, et al. The continuing 2019-nCoV epidemic threat of novel coronaviruses to global health: the latest 2019 novel coronavirus outbreak in Wuhan, China. Int J Infect Dis. 2020;2020(91):264–6.
2. Zhu N, Zhang D, Wang W, et al. A novel coronavirus from patients with pneumonia in China. N Engl J Med. 2020;382:727–33.
3. Mackenzie JS, Smith DW. COVID-19: a novel zoonotic disease caused by a coronavirus from China: what we know and what we don't [published online ahead of print, 2020 Mar 17]. Microbiol Aust. 2020;MA20013.
4. Huang C, Wang Y, Li X, et al. Clinical features of patients infected with 2019 novel coronavirus in Wuhan, China. Lancet. 2020;395:497–506.
5. Yang X, Yu Y, Xu J, et al. Clinical course and outcomes of critically ill patients with SARS-CoV-2 pneumonia in Wuhan, China: a single-centered, retrospective, observational study. Lancet Respir Med. 2020;8(5):475–81.Fei Zhou et al: Clinical course and risk factors for mortality of adult inpatients with COVID-19 in Wuhan, China: a retrospective cohort study: Lancet 2020; 395: 1054–62
6. Grifoni E, Valoriani A, Cei F, et al. Interleukin-6 as prognosticator in patients with COVID-19. J Infect. 2020;81(3):452-482.
7. Zhou F., Yu T., Du R., Fan G., Liu Y., Liu Z. Clinical course and risk factors for mortality of adult inpatients with COVID-19 in Wuhan, China: a retrospective cohort study. Lancet. 2020;395:1054–106
8. Lippi G., Favaloro E.J. D-dimer is associated with severity of Coronavirus Disease 2019: a pooled analysis. Thromb Haemost. 2020;120: 876–878.
9. Dai RX, Kong QH, Mao B, et al. The mortality risk factor of community acquired pneumonia patients with chronic obstructive pulmonary disease: a retrospective cohort study. BMC Pulm Med. 2018;18(1):12
10. Smeeth L, Thomas SL, Hall AJ, et al. Risk of myocardial infarction and stroke after acute infection or vaccination. N Engl J Med. 2004;351:2611–261
11. Ripa M, Galli L, Poli A, et al. Secondary infections in patients hospitalized with COVID-19: incidence and predictive factors [published online ahead of print, 2020 Oct 24]. Clin Microbiol Infect. 2020;S1198-743X(20)30652-2.

12. José Portolés et al :Chronic kidney disease and acute kidney injury in the COVID-19 Spanish outbreak: Nephrology Dialysis Transplantation. 2020; 35(8): 1353-136
13. Shah A, Donovan K, McHugh A, et al. Thrombotic and haemorrhagic complications in critically ill patients with COVID-19: a multicentre observational study. Crit Care. 2020; 24(1):561.
14. Fraissé M, Logre E, Pajot O, Mentec H, Plantefeve G, Contou D. Thrombotic and hemorrhagic events in critically ill COVID-19 patients: a French monocenter retrospective study. Crit Care. 2020;24:275.
15. Soni SL, Kajal K, Yaddanapudi LN, Malhotra P, Puri GD, Bhalla A, Singh MP, Sehgal IS, Koushal V, Varma N, Biswal M, Lakshmi PVM, Sharma S, Suri V, Deepy Z, Ram S, Yadav J, Pandey N, Sharma P, Malik N, Goyal K, Mehra A, Sahoo S, Mohindra R, Francis J, Bhargava M, Singla K, Babu P, Verma A, Khaire NS, Guru RR. Demographic & clinical profile of patients with COVID-19 at a tertiary care hospital in north India. Indian J Med Res. 2020 Nov 19. doi: 10.4103/ijmr.IJMR_2311_20. Epub ahead of print. PMID: 33208558
16. Ramanan Laxminarayan, et al: The epidemiology of SARS-CoV-2 in southern India shows marked differences from that observed in higher-income countries: Science 2020 : 691-697.

Conflict of Interest: Nil
Source of support:Nil