

Clinical Characteristics, Comorbidities, Initial Management and Outcome of COVID-19 Infected Patients Admitted to Intensive Care Unit in Somalia: A National Retrospective Study.

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Research

Keywords: Coronavirus disease 2019 (COVID-19), Invasive ventilation, Endotracheal intubation, intensive care unit, Diabetic

Posted Date: September 4th, 2020

DOI: <https://doi.org/10.21203/rs.3.rs-66767/v1>

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Abstract

Purpose: To investigate the clinical characteristics, morbidities, management, and outcomes of COVID-19 Infected patients admitted to the intensive care unit (ICU) in Somalia.

Material and methods: We conducted a retrospective observational study of laboratory 60 confirmed patients with severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) admitted to an ICU from March 28, to May 28, 2020. The sociodemographic characteristics, comorbidities, exposure history, clinical manifestations (symptoms and signs), laboratory findings, treatment, and outcomes were collected from medical records.

Results: Most of the patients admitted to ICU were men over 59 years of age, and nearly half had diabetes followed by hypertension chronic kidney disease and asthma. The most clinical presentations were dyspnea (91.2%), Fever (81.1%), (68.75%), Fatigue and myalgia (25%), and Altered level of conscious (16.6%). Among 48 patients admitted to the ICU, about 24 (50%) patients had required endotracheal intubation and mechanical ventilation, and 11(29.9%) patients needed noninvasive ventilation, while 13(27.08%) patients treated with high-flow oxygen therapy >15 L/min (Table 3). Corticosteroids were administered to most patients (85.4%), while 77.1% of the patients received inhaled bronchodilators and more than half of the patients administered antibiotics. 58.3% of the patients had received Oseltamivir, while 22.9% received Vasopressors.

Conclusion

This study represents the first description of critically ill patients infected with SARS-CoV-2 admitted to ICU in Somalia. The study identified that elder age, male gender, and diabetic and hypertensive comorbidities as independent risk factors of poor outcomes for patients admitted to the ICU ($p < 0.005$).

Introduction:

Coronavirus Disease-2019 (COVID-19) had discovered in Wuhan, China, in December 2019 and described as acute viral pneumonia that recently found in humans (1). On 11 March 2020, due to the continually increasing number of COVID-19 cases outside of China, the World Health Organization (WHO) declared as outbreak pandemic(2). On admission, 20–51% of patients had reported as having at least one comorbidity, with diabetes (10–20%), hypertension (10–15%), and other vascular diseases (including the cardiac and brain) (7–40%) being most common (1, 3). Systemic inflammation, coagulation activation, endothelial dysfunction, Renal failure, myocardial injury, and multiorgan failure had described as the most severe complications of severe COVID-19 (2, 4, 5, 6). Previous studies suggest that 5–20% of patients with *SARS-CoV-2* develop a critical illness that is characterized primarily by acute respiratory distress syndrome (7, 8). China, among the COVID-19 infected, 5–32% had required ICU care (1, 9). More than 3 million people worldwide have become infected with Severe acute respiratory syndrome coronavirus 2 (*SARS-CoV-2*), resulting in more than 215 000 deaths, with geographical mortality rates ranging from less than 1–12% (10). Primary studies from China, Italy, and the United state-reported

overall mortality ranging from 23–62% in critically ill patients with COVID-19 (8, 11, 12, 13). By 17 April 2020, 116 confirmed cases were reported in Somalia with 2 (1.7%) recovered cases and 5 (4.3%) deaths and Till now, the reported cases were mostly among adults, with no pediatric cases reported (14).

In this study, we investigated the clinical characteristics, morbidities, management, and outcomes of COVID-19 Infected patients admitted to the intensive care unit (ICU) in Somalia.

Material And Methods:

We conducted a retrospective observational study of laboratory 60 confirmed patients with severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) admitted to an ICU in the De Martino Public Hospital from March 28, to May 28, 2020, with outcomes observed until Jun 30, 2020. The study had conducted in a tertiary hospital that has 20 ICU beds. From anticipation of the COVID-19 pandemic in Somalia, this is the only hospital that was nominated as COVID-19 center in Somalia, and critically ill patients with SARS-CoV-2 in their catchment areas had transferred to this Hospital. All the medical records of confirmed COVID-19 cases were reviewed at least by two or more health care workers. The sociodemographic characteristics, comorbidities, exposure history, clinical manifestations (symptoms and signs), laboratory and radiological findings, treatment guidelines, and outcomes collected from medical records. All data were entered and analyzed by SPSS version 23. Different researchers performed the double-check of the data to avoid errors. The diagnostic criteria of acute respiratory distress syndrome (ARDS), acute cardiac damage, acute renal impairment, and acute liver injury had based on the corresponding guidelines (15, 16). The criteria for discharge were based on the clinical guidelines for the diagnosis and treatment of novel corona virus infection by the Chinese National Health Commission (Trial Version 5) and were grouped into severe and non-severe COVID-19 (17). According to the protocol of WHO guidance (18), all patients were confirmed by a throat swab sample obtained from the upper respiratory tract and defined as a positive result of real-time reverse transcriptase-polymerase chain reaction (RT-PCR) assay and also following the Centers for Disease Control and Prevention (CDC) guidelines. The study has been reviewed and approved by the Medical Ethical Committees of Mogadishu Somalia Turkey Training and Research Hospital, and De Martino Hospital. In agreement with the declaration of Helsinki, institutional review board (IRB) allowed the patient consent waiver to review their medical records in this retrospective study where the participants could not contact, and there was no risk to the participants, confidential and, all personal descriptions had excluded from the datasheet (anonymization).

Results:

Between April 23, to Jun 28, 2020, 443 patients had been admitted to Di Martino Public Hospital with confirmed COVID-19 pneumonia, of whom 48 admitted to ICU, including five patients who had cardiac arrest immediately after admission. Overall, 48 COVID-19 infected patients were admitted to ICU. Of these patients, 24 (50%) were severely affected patients and required endotracheal intubation and mechanical ventilation, while 24 (50%) patients were moderately affected by the coronavirus and treated with noninvasive respiratory support or high-flow oxygen therapy > 15 L/min.

As table 1 shows, the mean age of COVID-19 patients admitted to the ICU was 48 ± 16 years, ranging from 19 to 80 years among 48 patients. A total of 34 (%) of the patients were males and 14) were females. 14.6% of the patients had a history of exposure to a positive patient, and 79.2% of patients were unknown exposure, while 6.2% of patients had no known history of exposure. Most of the COVID-19 patients (91.6%) admitted to the ICU had at least one comorbidity with diabetic (39.5%;n = 19) and hypertension (18.75%;n = 9) as the most common comorbidities followed by Chronic kidney disease and asthma.

The most clinical presentations were dyspnea (91.2%), Fever (81.1%), (68.75%), Fatigue and myalgia (25%), and Altered level of conscious (16.6%). Only four (8.3%) did not develop dyspnea until 4-9days after the onset of symptoms associated with SARS-CoV-2 pneumonia, while 9 (18.75%) patients did not experience Fever till 4-9days next to the onset COVID-19 related symptom (Table 2).

On admission, the mean white blood cell count(WBC) was $17.6\mu\text{L}$ and, the mean of hemoglobin (Hb) was 11.9 mg/dl, while the mean platelets were 238.4. Only 12 (%) patients had Anemia and, seven patients (67%) had an absolute lymphocyte count of fewer than 1000 cells/ μL . Most of the patients had normal renal and liver function tests. Only 9 (18.75%) patients had abnormal liver function taste, while 3 (6.25%) patients having SARS-CoV-2 infection those admitted to the ICU had azotemia. Patients with increased CRP were more than those within the normal range (Table 2).

Among 48 patients those admitted to the ICU, about 24 (50%) patients had required endotracheal intubation and mechanical ventilation, and 11(29.9%) patients needed noninvasive ventilation, while 13(27.08%) patients treated with high-flow oxygen therapy $> 15 \text{ L/min}$ (Table 3). More than two-thirds of patients admitted to the ICU those required endotracheal intubation and mechanical ventilation were those elder than 65 years and those having at least one comorbid disease.

Corticosteroids were administered to most patients (85.4%), while 77.1% of the patients received inhaled bronchodilators and Morethan half of the patients administered antibiotics. 58.3% of the patients had received Oseltamivir, and 22.9% received Vasopressors.

Nearly two-thirds of patients died in the intensive care unit, while 14.5% were still in ICU required for further management. After successful management, 22.9% of the patients transferred to the non-ICU inpatient and only one lucky patients discharged to the home on foot.

Discussion:

This study represents the first and most comprehensive study of patients admitted to ICU with COVID-19-related critical illness reported to date in Somalia. COVID-19 is a pandemic disease that hit hard throughout the globe, yet no known treatment or vaccination available at the time.

This study included a total of 48 patients admitted in the intensive care unit with SARS-CoV-2 infection in Di Martino Hospital that is the only hospital nominated as COVID-19 center in Somalia between April

2020 to Jun 2020.

Most of the patients admitted to ICU were men over 59 years of age, and nearly half had diabetes.

In the present study, the majority of patients admitted to the ICU because of acute hypoxemic respiratory failure that required respiratory support.

We identified elder that age, male gender, and diabetic and hypertensive comorbidities as independent risk factors of poor outcomes for patients admitted to the ICU ($p < 0.005$).

About 10.8% of the total patients admitted to the hospital due to COVID-19 were admitted to the ICU. Half of the patients admitted to the ICU had required endotracheal intubation and invasive mechanical ventilation. Of these patients who underwent mechanical ventilation, 12 (25%) patients died, 6(12.5%) patients remain in ICU, 5 (10.4%) patients transferred to non-ICU inpatients and, only 1 (2.08%) patient was discharged to home by foot. Noninvasive mechanical ventilation had initiated in 11(22.9%) patients, while 13 (27.08%) patients had required high-flow oxygen therapy > 15 L/min.

Similarly to the present study, the use of noninvasive ventilation reported as 19% in Washington State, US, 42% in Wuhan, and 62% in Wuhan, China (note, this value included patients receiving high-flow nasal cannula) (20, 19, 1).

In the present study, the number of patients required invasive mechanical ventilation higher than that recently reported for other ICU patients: 42% (Wuhan, China) and 47% (Wuhan, China) (8, 19), while another study in Washington State had reported about 71% of patients admitted to ICU had required invasive mechanical ventilation that is much more than when compared to our study (20).

In our study, among half of the patients admitted to the intensive care unit died due to acute respiratory distress syndrome (ARDS) and other COVID-19 complications. This higher rate of death was related to delayed seek for the medical care of the patients due to some cultural issues, short coverage of proper and adequate intensive care units, and lack of experience with the use of mechanical ventilators and other invasive facilities in our country. Similar studies in Wuhan, Lombardy, and Seattle had shown a higher mortality rate between 50–80%for critically ill COVID-19 infected patients admitted to the ICU (8, 11, 12).

Conclusion:

This study represents the first description of critically ill patients infected with SARS-CoV-2 admitted to ICU in Somalia. The study identified that elder age, male gender, and diabetic and hypertensive comorbidities as independent risk factors of poor outcomes for patients admitted to the ICU ($p < 0.005$).

Declarations

Ethics approval and consent to participate:

We obtained an approval letter from the review board of Mogadishu Somali Turkish Training and Research Hospital and written informed consent was waived (**MSTH/3712**) because the study was retrospective and collected from medical records. We declare that we have followed the protocols of our work center. Patient data confidentiality was respected.

Availability of data and materials:

The data that support the findings of this study are available from Mogadishu Somali Turkish Training and Research Hospital. Data are however available from the authors upon reasonable request and with permission of Mogadishu Somali Turkish Training and Research Hospital.

Competing of interes and Funding:

We declare that we have no competing interests and funding source.

Authors' contributions

M.F.Y.M. and A.S.H.: Writing of the manuscript, final revision of data, statistical tables, and and finalization of the research manuscript. I.H.A and A.M.Y.: idea of the research, supervision, and revision of data. A.H.M and M.A.A.: collecting data, and helping in writing of the manuscript. All authors read and approved the final manuscript.

Acknowledgements:

Not applicable.

Consent For Publication:

Not applicable.

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