ORIGINAL RESEARCH PAPER

General Medicine

COVID-19 - A STUDY ON CLINICAL PROFILE AND DIVERSE PRESENTATION IN A FIELD HOSPITAL IN SOUTH SUDAN

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ABSTRACT

BACKGROUND: COVID-19 has affected over 71.4 million individuals resulting in more than 1.6 million deaths worldwide. The purpose of this study is to observe the clinical features of Covid 19 patients of different ethnic and geographical area admitted to United Nation's (UN) field hospital in African country South Sudan. **OBJECTIVE:** To study the various clinical presentations of Covid 19 patients in international setup in African country. **MATERIALS AND METHODS:** A retrospective observational study was conducted on 39 Patients of Covid 19. Data were analysed using Statistical Programme for Social Sciences (SPSS). **RESULTS:** Out of 39 patients 12.8% & 87.1% were female & male respectively of diverse geographical distribution mostly from Asia and Africa. However patients from Russia and Europe (Netherland) were also included. The average age of patients was 39 yrs with average hospital stay of 7.28 days. Fever was the most common symptom, present in 71.8% followed by cough present in 41% and loss of appetite present in 35.8% patients. Palpitation, nausea & vomiting were found in 28% patients each. A total of 25.6% patients had dyspnea. Headache was there in 17.9%. Clinical examination at presentation revealed abnormal chest auscultation in 35.8%, tachycardia was observed in 30.77%, tachypnea in 28% patients. Hypoxia was seen in 30.7% patients. Systolic blood pressure of >140 mm Hg was found in 17.9% and diastolic blood pressure of >90 mm Hg was found in 12.8% patients. Mean Hemoglobin level was 14.24 gm/dl, Leucocytocis was noted in 7%, leucopenia were found in 12.8%, Neutrophil lymphocyte ratio <3.3 was seen in 56.4% patients and Thrombocytopenia in 5.12% patients. Deranged liver function test were found in 46.2% patients. D-dimer were found positive in 7.7% and C reactive protein in 35.9% patients. Abnormal chests X-rays were found in 47.5 % patients.

Introduction

There are four genera of Corona viruses, which are RNA viruses. Human infections have mostly been associated with alpha and beta corona viruses (1). SARS-CoV-2 is related to bat corona viruses and SARS-CoV-1 causes severe acute respiratory syndrome (SARS) (2). SARS-CoV-2 attaches to angiotensin-converting–enzyme 2 (ACE2) receptor and gain entry to human cells similar to SARS-CoV-1 (3). At the end of 2019 in Wuhan, China, a new strain of corona virus, named severe acute respiratory syndrome corona virus 2 (SARS CoV-2) resulted in an acute respiratory illness epidemic (4). This illness was termed as Corona virus Disease 2019 (COVID-19) by World Health Organization (WHO). The median incubation period, from exposure to symptom onset, is approximately 4 to 5 days and 97.5% of patients became symptomatic within 10 to 11 days after infection (5). Symptoms may include malaise, fever and sore throat, cough and muscle pains. Gastrointestinal symptoms like nausea, anorexia and loose stools were present in few patients (6, 7). Anosmia and ageusia have also been reported (8, 9). Some series reported that some patients in hospital developed breathing difficulty and shortness of breath after a period of 5 to 8 days after initial symptom onset (6, 10); which is a feature of worsening disease. Elderly (e.g., >65 years), cardiovascular disease, chronic lung disease, hypertension, diabetes and obesity were considered as risk factors of severe disease (10-14). It is under evaluation that certain other conditions (uncontrolled human immunodeficiency virus [HIV] infection, immunosuppression, kidney disease and cancer) confer an increased risk of complications require close monitoring of patients with Covid-19 associated with these conditions. The COVID-19 has become a pandemic and has affected over 71.4 million individuals in more than 180 countries, and resulted in more than 1.6 million deaths worldwide. The purpose of this study is to observe the clinical features of Covid 19 patients of different ethnic and geographical area admitted to United Nation's (UN) field hospital in African country South Sudan.

MATERIALS AND METHODS

Study population: A total of 39 Patients of Laboratory Confirmed Covid 19, who were admitted to UN Indian field hospital in South Sudan.

Sample design: Retrospective observational study
Study period: 01 April 2020 to 15 Nov 2020

Study Oversight

The study was designed by the investigators. Data were analyzed and interpreted by the authors. All the authors reviewed the manuscript and vouch for the accuracy and completeness of the data and for the adherence of the study to the protocol.

Data Sources

We obtained the medical records and compiled data for hospitalized patients with laboratory-confirmed Covid-19, as reported to the UN Indian field hospital in South Sudan between April 1, 2020, and November15 2020. A confirmed case of Covid-19 was defined as a positive result on high

through put sequencing or real-time reverse-transcriptase–polymerase-chain-reaction (RT-PCR) assay of nasal and pharyngeal swab specimens (15). Only laboratory-confirmed cases were included in the analysis. Radiologic assessments included chest radiography and all laboratory testing was performed according to the clinical care needs of the patient.

Analysis of data: All raw data collected were entered into a Microsoft Excel Spreadsheet and analyzed using standard statistical software, Statistical Programme for Social Sciences (SPSS) 15.0 for Microsoft Windows (SPSS Inc. Chicago, IL, USA), Continuous numerical data was described as means, standard deviations, medians, minimum, maximum and standard error of mean. Further, mean was compared by ANNOVA test; distributions were compared using Pearson's Chi Square Test. Percentage distribution of age, clinical features and recovery were computed. Chi-square test was used to analyze proportional difference in recovery. Level of significance was taken as 5% (p<0.05).

RESULTS

Out of 39 patients of laboratory confirmed COVID-19 cases included in study, five (12.8%) were female & 34 (87.1%) were male, the average age of patients was 39 yrs with youngest of 20 yrs and eldest of 70 yrs. The geographical distribution of the patients was diverse, comprising predominantly from countries of Asia and Africa. However patients from Russia and Europe (Netherland) were also included. The countries South Sudan and Bangladesh contributed to the maximum number of patients (15.4% each) (Fig.1). Average hospital stay of patients is 7.28 days amongst which 9 (23.1 %) were evacuated to higher center in view of multiple organ dysfunction and neurological complications.

Fig. 1
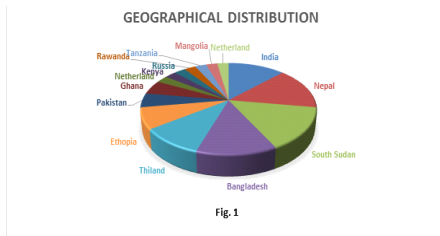
At initial presentation to medical facility, fever was the most common symptom, present in 28 (71.8%) patients followed by cough which was present in 16 (41%) patients, followed by loss of appetite present in 14 (35.8%) patients. Palpitation, nausea & vomiting were found in 11 (28%) patients each. A total of 10 (25.6%) patients had dyspnea. Headache was there in 07 patients (17.9%) followed by mild diffuse abdominal pain which was present in 06 patients (15.38%) and loose motions in 04 patients (7.69%). Frequencies of these symptoms were similar in both groups. (Table 2) Clinical examination at presentation revealed bilateral basal crackles on chest auscultation in 14 patients (35.8%), body temperature of more than 1000 F was present in 14 patients (35.8%), tachycardia(heart rate more than 100) was observed in 12 patients (30.77%) followed by tachypnea (respiratory rate > 24/min) in 11 patients (28%).

Hypoxia (SpO2 <94%) (16) was seen in 12 out of 39 patients (30.7%), amongst 9 who were evacuated 5 had hypoxia (55.6%) compared to 7 out of 30 (23.33%) patients who were treated in this hospital. Similarly systolic blood pressure (SBP) >140 mm Hg at presentation was found in 07 patients (17.9%) and diastolic blood pressure (DBP) of >90 mm Hg was found in 05 patients (12.8%) and in 4 (44.4%) had high SBP and 3 (33.3%) had high DBP out of 09 patients who were evacuated (Table 2) (Fig.2).

Laboratory parameters showed mean Hemoglobin (Hb) level 14.24 (minimum 9-maximum 17.3) gm/dl, Leucocytocis (total leucocytes count > 11000/cumm) noted in 03 patients (7%) whereas leucopenia were found in 05 patients (12.8%), Leucopenia was also seen in 3 out of 9 (33.3%) patients who were evacuated (Fig.2). Neutrophil lymphocyte ratio (NLR) <3.3 was seen in 22 patients (56.4%) (17). Thrombocytopenia was found in 02 patients (5.12%), both of these were treated in hospital.

Deranged liver function test (LFT) were found in 18 (46.2%) patients and all had raised AST whereas 17 (43.6%) had raised ALT. D dimer were found positive in 03 (7.7%) whereas C reactive protein (CRP) was positive in 14 (35.9%) patients at presentation. Abnormal radiological finding over chest X-ray (CXR) were found in 19 (47.5 %) at initial presentation.
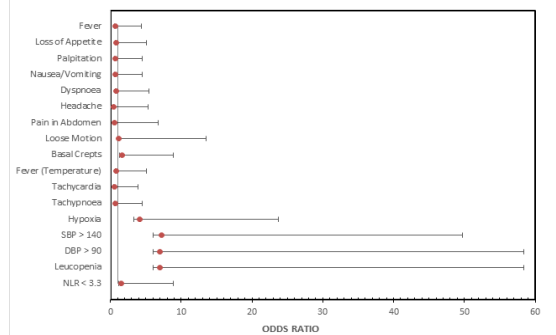

Figure 2: Subgroup analysis of clinical characteristics

TABLE 1: Clinical characteristics of patients admitted with Covid 19.

	N (%)		N (%)
Age group (years)		Fever	28 (71.8)
≤ 30	5 (12.8)	Cough	16 (41.0)
31 - 40	20 (51.3)	Loss of Appetite	14 (35.9)
41 - 50	11 (28.2)	Palpitation	11 (28.2)
51 - 60	2 (5.1)	Nausea/Vomiting	11 (28.2)
> 60	1 (2.6)	Dyspnoea	10 (25.6)
Sex		Headache	7 (17.9)
Male	34 (87.2)	Pain in Abdomen	6 (15.4)
Female	5 (12.8)	Loose Motion	4 (10.3)
Co-morbidities	14 (35.9)	Altered Sensorium	3 (7.7)
Hypertension	2 (5.13)	Basal Crepts	14 (35.9)
Malaria	5 (12.82)	Fever	14 (35.9)
Recurrent Jaundice	2 (5.13)	Tachycardia	12 (30.8)
Stroke	2 (5.13)	Tachypnoea	11 (28.2)
T2DM	2 (5.13)	Hypoxia	12 (30.8)
Pregnancy	1 (2.6)	SBP > 140	7 (17.9)
Trauma	2 (5.1)	DBP > 90	5 (12.8)
CKD	1 (2.6)	Leucocytosis	3 (7.7)
Acute appendicitis	1 (2.6)	Leucopenia	5 (12.8)
Bronchial Asthma	1 (2.6)	NLR < 3.3	22 (56.4)
Hepatocellular Carcinoma	1 (2.6)	Thrombocytopenia	2 (5.1)

Discusson

The current series of 39 patients represents the first initial data on corona virus in international medical setup of UNs in South Sudan. The infection was observed in all age groups with predominance in young adults. This may be related to travel and behavioral characteristic by very young and elderly people and may not be related to susceptibility of these populations. To the best of our knowledge, this is the first

study of clinical characteristics of hospitalized patients infected with SARS-CoV2 from a city in South Sudan in Africa involving diverse patient populations.

In our study, fever was the most common presenting symptom which was reported in various studies of this pandemic in different parts of world (18-20.) Second most common symptom was cough which was present in 41% patients. Despite of presence of radiological abnormality in 47.5% patients, hypoxia was present in lesser number of patients (30.7%) whereas high percentage of hypoxia (55.6%) was observed in patients who developed multiorgan dysfunction (p=0.06). In study done by Saurabh et al cough was present in 88%, however abnormal CXR was present in 44%, out of which lesser patients were hypoxic as being observed in this study (20). Whereas another study done by Nitish Gupta et al showed abnormal CXR findings only in 4.8% of patients (19). Contrary to the Brazilian study which showed 23.4% abnormal CXR at presentation (18). We found that loss of appetite is a significant symptom present in 35.8% of patients and diffuse abdominal pain in 15% on initial presentation.

In our study we found that basal crackles were present in 35.8%, tachycardia (heart rate > 100/min) was observed in 30.77% patients and tachypnea (respiratory rate > 24/min) in 28% patients. Also another study done by Saurabh et al witnessed tachycardia in 31% patients (20).

None of the patients at presentation were hypotensive. Similar findings were found in other studies (20). SBP >140 mm Hg at presentation was found in 44.4% (p=0.01) and DBP of >90 mm Hg was found in 33.3% (p=0.03) patients who were evacuated. We observed leucocytosis (total leucocytes count > 11000/cumm) in 7% whereas another study done by Saurabh et al found leukocytosis in 19% (20). We observed leucopenia in 12.8% & thrombocytopenia in 6.7% patients. A Brazilian study observed leucopenia in 21.5% and thrombocytopenia in 25.9% patients (18). Leucopenia was also seen in 33.3% (p=0.03) of patients who were evacuated with severe disease which is consistent with a retrospective study conducted on a cruise ship, where the prevalence of lymphopenia was higher in participants who had severe COVID-19 than in those with mild disease (21). We observed low NLR (<3.3) in 56.4% patients. Low NLR is associated with good prognosis as observed in other studies (17).

Table 2: Comparison of Clinical characteristics of patients evacuated to higher centers to the patients treated in level II hospital

	Evacuated to Level IV (n=9)(%)	Treated at level II (n=30)(%)	Total (n=39) (%)	p-value	Odds Ratio	C.I.
Fever	6 (66.7)	22 (73.3)	28(71.8)	0.697	0.73	0.15 - 3.62
Loss of Appetite	3 (33.3)	11 (36.7)	14 (35.9)	0.855	0.86	0.18 - 4.16
Palpitation	2 (22.2)	9 (30)	11 (28.2)	0.649	0.67	0.12 - 3.85
Nausea/Vomiting	2 (22.2)	9(30)	11 (28.2)	0.649	0.67	0.12 - 3.85
Dyspnoea	2 (22.2)	8 (26.7)	10 (25.6)	0.789	0.79	0.13 - 4.60
Headache	1 (11.1)	6 (20)	7 (17.9)	0.542	0.50	0.05 - 4.81
Pain in Abdomen	1(11.1)	5 (16.7)	6 (15.4)	0.685	0.63	0.06 - 6.17
Loose Motion	1(11.1)	3 (10)	4 (10.3)	0.923	1.13	0.10 - 12.36
Altered Sensorium	0	1 (3.3)	3 (7.7)	0.579	0.00	-
Basal Crepts	4 (44.4)	10(33.3)	14 (35.9)	0.542	1.60	0.35 - 7.30
Fever (Temperature)	3(33.3)	11(36.7)	14 (35.9)	0.855	0.86	0.18 - 4.16
Tachycardia	2 (22.2)	10 (33.3)	12 (30.8)	0.144	0.57	0.10 - 3.27
Tachypnoea	2 (22.2)	9(30)	11 (28.2)	0.649	0.67	0.12 - 3.85
Hypoxia	5 (55.6)	7 (23.3)	12 (30.8)	0.066	4.11	0.86 - 19.61
SBP > 140	4(44.4)	3 (10)	7 (17.9)	0.018	7.20	1.22 - 42.49
DBP > 90	3(33.3)	2 (6.7)	5 (12.8)	0.036	7.00	0.95 - 51.45
Leucocytosis	0	3(10)	3 (7.7)	0.323	0.00	-
Leucopenia	3(33.3)	2(6.7)	5 (12.8)	0.036	7.00	0.95 - 51.45
NLR < 3.3	6(66.7)	17 (56.7)	22 (56.4)	0.593	1.53	0.32 - 7.30
Thrombocytopenia	0	2(6.7)	2 (5.1)	0.426	0.00	-

Limitations

The sample size in the current study is characterized by a small cohort. The spread of the pandemic to various geographic locations, age groups and co-morbid patients may behave differently and hence these results may be difficult to generalize at national or international level.

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