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Clinical Characteristics of the First 100 Patients of COVID-19 in Tobruk, Libya: A Brief Report From Low-Resource Settings

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Brief Report

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Abstract

Objective: This study aims to report the clinical features of a cohort of patients with suspected coronavirus disease (COVID-19) from Tobruk, Libya, and reflect upon the diagnosis challenge in low-resource settings.

Methods: A descriptive report of the first 100 patients with suspected COVID-19 who have visited the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) and COVID-19 screening clinic at the National Centre for Disease Control in Tobruk, Libya.

Results: The most common presenting symptoms were fever (90%), cough (89%), dyspnea (85%), sore throat (79%), fatigue (78%), headache (64%), loss of smell (52%), loss of taste (53%), loss of appetite (43%), nausea and vomiting (26%), diarrhea (22%), and rhinorrhea (16%); 51% of the patients had lymphocytopenia, whereas 13% had thrombocytopenia. Bilateral infiltrates were the most common radiologic finding on chest X-ray (76%), and COVID-19 IgM and/or IgG antibodies were detected in 80% of the patients, whereas only 37% of the patients were tested positive by the reverse transcriptase polymerase chain reaction (RT-PCR).

Conclusions: The disease continued its spread across the region. Fever, cough, and dyspnea were the main symptoms; 21% of the patients did not have any chest X-ray abnormalities. Initial negative results for either antibody testing or RT-PCR-testing for COVID-19 do not rule out the infection.

Introduction

Since the outbreak reported in December 2019, the pandemic of coronavirus disease (COVID-19) continues to be a major public health concern in the world. The outbreak has been declared a global pandemic in March 2020 by the World Health Organization.[1] In Libya, as of today, February 18, 2021, the National Centre for Disease Control (NCDC) of Libya announced 585 new COVID-19 cases, and the total confirmed cases reached 129 325.[2]

The health authorities and the NCDC in the country as a part of the prevention plan of the COVID-19 have prepared screening clinics for the patients with respiratory symptoms and equipped special isolation facilities to isolate individuals suspected as positive for COVID-19. However, the rapid diagnosis of COVID-19 can be difficult due to the different levels of disease severity and the diversity of clinical features, as well as laboratory and radiologic results[3]; especially in low-resource settings, where many important diagnostic tools are unavailable. Here, we described the clinical features and the available laboratory and radiologic findings for the initial cases with suspected COVID-19 from Tobruk, with the primary aim of making population-based data available to outside researchers in the wake of societal challenges posed by the global pandemic.

Subjects and Methods

In this study, we have described the clinical features of the first 100 patients with suspected COVID-19 who have visited the COVID-19 screening clinic in Tobruk, Libya, during a period of 2 months from the date of the first case reported (July 23, 2020). The clinic is an outpatient clinic where the patients with suspected COVID-19 are assessed and transferred to the isolation facility in the city, if required. The clinic is equipped with basic investigation tools, including a hematology analyzer, chest X-ray (CXR), and a rapid point-of-care lateral flow immunoassay IgM-IgG combined antibody test for COVID-19. During the period of study reported here, 100 cases visiting the out-patient screening clinic were referred to the isolation facility.

Only treatments to relieve symptoms (such as antipyretics, IV fluids, and supplemental oxygen) were given to the patients, as required. In the isolation facility, the patients were subjected to further evaluation; their nasopharyngeal swab specimens were collected and sent to a remote COVID-19 reverse transcriptase polymerase chain reaction (RT-PCR) laboratory in Benghazi. The patients were triaged according to their condition severity and oxygen saturation, and all patients were treated and managed according to the Medical Committee of COVID-19 Management Guidelines of Libya.

The RT-PCR testing of the nasopharyngeal swabs had to be done at a remote location because the NCDC of Libya was provided a GeneXpert®, a cartridge-based nucleic acid amplification test (CB-NAAT), for tuberculosis diagnosis before the start of the COVID-19 outbreak in the city and only recently has provided the assay that now enables the GeneXpert to be used to test COVID-19. Currently, all COVID-19 nasopharyngeal swabs are tested in the NCDC Tobruk, using the GeneXpert platform.

Laboratory Tests and Chest X-ray Imaging

The only available laboratory tests in the clinic were the hematology analyzer to perform a complete blood count (CBC) test, and the rapid point-of-care lateral flow immunoassay total antibodies (IgM, IgG) for COVID-19 (Standard Q COVID-19 IgM/IgG Duo, by SD Biosensor, Republic of Korea). Venous whole blood was collected from patients into plain tubes. The test was performed as per the manufacturer instructions. A CXR was performed to all inpatients in the clinical radiology department. Interpretation of the CXRs was done by the respiratory diseases (viz, tuberculosis and other chest infections) specialist. Patients' data, including sex, age, address, signs and symptoms, and date of illness onset, were collected by the treating physicians.

Nucleic Acid Detection

Members of the rapid response team obtained the nasopharyngeal swabs from the patients at the isolation facility and sent the samples to the COVID-19 laboratory (in Benghazi) for the RT-PCR analysis.

The RNA extraction was carried out by QIAamp Viral RNA Mini Kit, QIAGEN®, using the automated extraction robotic workstation (QIAGEN). RT-PCR analysis was performed by Bioperfectus Technologies COVID-19 Coronavirus Real Time PCR Kit, Version 5.0.

Ethical Considerations

The study was approved by the Ethical Committees of the NCDC, Libya. The purpose and the procedure of the study were explained to the patients, and their written consent to use their data in the research was obtained. The obtained personal data and the results of the medical investigations of the patients were anonymous, and the patients' data cannot be correlated to the results obtained.

Statistical Analysis

Data were analyzed using Microsoft Excel 2016. Results were described using the frequency numbers and percentages, n (%). Patients' ages were expressed as the median and interquartile range (IQR).

Results

Among the 100 patients, the median age (IQR) was 52 years (44–64), and 43% were male. The most common presenting symptoms were fever (90%), cough (89%), dyspnea (85%), sore throat (79%), fatigue (78%), headache (64%), loss of smell (52%), loss of taste (53%), loss of appetite (43%), nausea and vomiting (26%), diarrhea (22%), and rhinorrhea (16%); 51% of the patients had lymphocytopenia, and 13% had thrombocytopenia. COVID-19 IgM and/or IgG antibodies were detected in 80% of patients, and 37% of the patients tested positive by RT-PCR.

CXR abnormalities were found in 79% patients: 76% had bilateral infiltrates, 2% had unilateral infiltrates, and increased broncho-vascular markings were observed in 1% of patients. The clinical symptoms, the results of the hematological and CXR findings, IgM/IgG antibodies for COVID-19, and RT-PCR results of patients are shown in Table 1.

Discussion

The clinical features of COVID-19 range from asymptomatic cases to severe respiratory disease.[3] In our study, the percentages of the most common features at arriving were generally higher than those reported in other studies from China[3] and New York City[4]; dyspnea appeared to be more common in our study followed by fever and cough. Also, the lymphocytopenia and thrombocytopenia rates were lower in our study.

COVID-19 IgM and/or IgG antibodies by the point-of-care rapid test were detected in 80% of the patients. The detection of COVID-19 antibodies is important, especially for patients who present late with mild symptoms.[5] The point-of-care rapid test for detecting COVID-19 antibodies was also useful; however, sensitivity and specificity of the test depend on the quality of the used commercial assay. However, antibody assays cannot substitute molecular tests.[6] Our results showed that COVID-19 antibodies might be detected several days after illness onset.

This study revealed that only 37% of the patients initially tested positive by the RT-PCR. Molecular detection of the virus nucleic acid using nasopharyngeal swab has been the standard method for detection of the COVID-19 infection. However, the false-negative result can be common, depending on disease stage, viral load, assay sensitivity, and the swabbing method.[7] Our study showed that 79% of the patients had CXR abnormalities, the majority (76%) of which had bilateral infiltrates. These findings were consistent with other studies, which found that the most frequently shown CXR abnormalities in COVID-19 patients are bilateral lung involvement; however, not all patients develop CXR abnormalities. Radiologic findings are important for diagnosing and evaluating the course of the disease and predicting its severity.[8]

A chest computed tomography (CT) scan is considered a valuable supplemental diagnostic mean in the diagnosis of COVID-19 patients, especially those with initial negative RT-PCR.[9] However, the CT scan was not performed because it was not available in our clinic.

Interestingly, however, even CXR analysis revealed a similar percentage variation of positive results (79% versus 37%, respectively) with RT-PCR as reported earlier during early screening.[9] Therefore, in epidemic areas of low resource settings and in the absence of RT-PCR kits, CXR may be used as a primary tool for quick screening and isolation purposes. The study revealed that 51% of the patients had lymphocytopenia and 13% had thrombocytopenia. The CBC was the only available hematology test in our

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Table 1. Characteristics of the patients

Characteristic	All Patients (n = 100)	Clinic Visit from the Onset of Symptoms		
		< 7 Days (n = 23)	8-14 Days (n = 58)	> 14 Days (n = 19)
Median age (IQR) – year	52 (44–64)	52 (44–64.25)	52 (44–64)	47 (43.75–64.75)
Male – no./total no. (%)	43 (43)	6 (26.1)	25 (43.1)	12 (63.2)
Available laboratory results – no. (%)				
COVID-19 IgM/IgG antibodies	80 (80)	14 (60.9)	51 (87.9)	15 (79.0)
COVID-19 IgM antibodies	74 (74)	13 (56.5)	49 (84.4)	12 (63.2)
COVID-19 IgG antibodies	72 (72)	8 (34.8)	49 (84.4)	15 (79.0)
Lymphocytopenia	51 (50)	15 (65.2)	32 (55.2)	4 (21.1)
Thrombocytopenia	13 (13)	2 (08.7)	9 (15.5)	2 (10.5)
RT-PCR positive result – no. (%)	37 (37)	11 (47.8)	18 (31.0)	7 (36.8)
Abnormalities on chest radiograph – no. (%)	79 (79)	17 (73.9)	49 (84.5)	14 (73.7)
Bilateral infiltrates	76 (76)	16 (69.6)	47 (81.0)	13 (68.4)
Unilateral infiltrates	1 (01)	1 (04.3)	0 (0)	0 (0)
Increased broncho-vascular markings	2 (02)	0 (0)	2 (3.4)	0 (0)
Signs and symptoms – no. (%)				
Fever	90 (90)	21 (91.3)	53 (91.4)	16 (84.2)
Cough	89 (89)	18 (78.3)	54 (93.1)	17 (89.5)
Dyspnea	80 (80)	21 (91.3)	44 (75.9)	15 (79.0)
Sore throat	79 (79)	18 (78.3)	44 (75.9)	17 (89.5)
Fatigue	78 (78)	15 (65.2)	45 (77.6)	19 (100)
Headache	64 (64)	18 (78.3)	39 (67.2)	7 (36.8)
Loss of taste	53 (53)	9 (39.1)	30 (51.7)	14 (73.7)
Loss of smell	52 (52)	7 (30.4)	32 (55.2)	13 (68.4)
Loss of appetite	43 (43)	9 (39.1)	20 (34.5)	14 (73.7)
Nausea and vomiting	26 (26)	5 (21.7)	13 (22.4)	8 (42.1)
Diarrhea	23 (23)	3 (13.0)	11 (19.0)	9 (47.4)
Rhinorrhea	16 (16)	4 (17.4)	11 (19.0)	1 (05.3)

Notes: Data are summarized as no. or n (%), where n is the total number of patients with available data.
RT-PCR = reverse transcriptase polymerase chain reaction.

clinic; however, other hematological parameters are also important for patients with suspected COVID-19; on the other hand, these hematological parameters are not specific for COVID-19 patients but could help clinicians assess the severity of the infection, patients' response to treatment, and the outcomes of patients. Therefore, patients with COVID-19 may have clinical presentations similar to other diseases that have similar symptoms.[10]

Limitations

The limitations of this report are that some patients' data were not available, such as the exposure history, and some laboratory testing was incomplete due to the unavailability of these tests in the clinic. Authors were not able to follow up patients, the treatment, repeated testing of the RT-PCR, and the outcomes of patients after they have referred to the isolation facility. However, this report reflected the clinical situation in resource-limited settings, where many important diagnostic aids, such as CT scan and RT-PCR, are unavailable in most COVID-19 screening clinics in the country.

Conclusion

The disease continued its spread across the region. Fever, cough, and dyspnea were the main symptoms. Twenty-one percent of the patients did not have any CXR abnormalities, and, initially, negative results for either antibodies or RT-PCR tests for COVID-19 do not rule out the infection and should not be used as the only basis for diagnosis; clinical features and epidemiological situation should be considered. The authors recommend that self-isolation for symptomatic individuals as soon as they get early symptoms would be of great significance for reducing the transmission of COVID-19.

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