

Clinical Characteristics of COVID-19 in a Tertiary Health Facility in Northeast Nigeria

Ballah Akawu Denu¹, Sepu Ngamariju², Habu Abdul², Abubakar Mohammad Musa³

¹Department of Medicine, College of Medical Sciences, University of Maiduguri, Maiduguri, Borno State, Departments of ²Medicine and ³Surgery, Federal Medical Centre, Nguru, Yobe State, Nigeria

Abstract

Aim: The coronavirus disease 2019 (COVID-19), caused by a newly identified β -coronavirus (severe acute respiratory syndrome coronavirus-2), has a varied clinical manifestation. We evaluated the clinical features of COVID-19 in symptomatic patients that presented for care at a Federal Medical Centre Nguru, Northeast Nigeria. **Methodology:** In this retrospective cohort study, we reviewed and analyzed relevant information abstracted from the medical records of symptomatic COVID-19 patients that were managed from March 14 to October 14, 2020, in the facility. **Results:** Clinical records of 55 symptomatic COVID-19 patients were evaluated in this study. Their mean age was 49.1 ± 16.3 (females 51.4 ± 15.6 , males 48.5 ± 17.2 , $P = 0.601$) with females constituting 47.2% of the studied patients. Fever (87.3%), cough (67.3%), sore throat (49.1%) and rhinorrhea (41.8%) were the most common clinical feature. Other features included difficulty in breathing (25.5%) and ageusia (14.6%). Gastrointestinal symptoms such as diarrhea, vomiting and abdominal pain were seen in 10.9%, 18.2%, and 9.1%, respectively. Twenty-one (38.2%) patients had a preexisting health condition. Chronic kidney disease was the most common; it was seen in 34% of patients, other common conditions included hypertensive heart disease (24%), and diabetes mellitus (16%). **Conclusion:** Respiratory symptoms are the most common presentation of COVID-19 in our setting. However, some patients also presented with additional extrapulmonary symptoms. A significant proportion, 38.2% of symptomatic COVID-19 patients, had preexisting health conditions.

Keywords: Clinical characteristics, coronavirus disease 2019, Northeast Nigeria

INTRODUCTION

Coronavirus disease 2019 (COVID-19), caused by severe acute respiratory syndrome-coronavirus-2 (SARS-CoV-2), has been shown to present respiratory symptoms that include cough, fever and difficulty in breathing.^[1] In addition to respiratory system involvement, COVID-19 due to SARS-CoV-2 may manifest with pathology related to hematologic, cardiovascular, renal, gastrointestinal and hepatobiliary, endocrinologic, neurologic, ophthalmologic, and dermatologic systems.^[1,2] The pathophysiologic basis of the clinical features of COVID-19 reflects both pulmonary and extra-pulmonary dissemination and replication of SARS-CoV-2 or widespread immunopathologic perturbation or complication of the disease.^[3,4] Various studies from several countries have reported a variety of clinical manifestations of COVID-19.^[5] In Nigeria and most low- and middle-income countries, COVID-19 testing has largely focused on patients with respiratory symptoms, this is despite reports of extrapulmonary presentations.^[4-6] Report on the

clinical features of COVID-19 in a locality is desirable for a better understanding of the disease and appropriate triaging of cases. Missed or misdiagnosed cases could facilitate rapid dissemination of COVID-19 by unwittingly spreading the virus in both hospital and community setting where universal testing is unobtainable.^[5,6] Patients without prominent respiratory symptoms may be a major driver of the ongoing COVID-19 pandemic.^[4,6] Studies have demonstrated the presence of SARS-CoV-2 RNA in gastrointestinal glandular epithelial cells. Intracellular staining of salivary, gastric, duodenal, and rectal epithelia have also revealed SARS-CoV-2 nucleocapsid

Address for correspondence: Dr. Ballah Akawu Denu,
Department of Medicine, College of Medical Sciences, University of
Maiduguri, Maiduguri, Borno State, Nigeria.
E-mail: d_akawu@yahoo.co.uk

This is an open access journal, and articles are distributed under the terms of the Creative Commons Attribution-NonCommercial-ShareAlike 4.0 License, which allows others to remix, tweak, and build upon the work non-commercially, as long as appropriate credit is given and the new creations are licensed under the identical terms.

For reprints contact: WKHLRPMedknow_reprints@wolterskluwer.com

How to cite this article: Denu BA, Ngamariju S, Abdul H, Musa AM. Clinical characteristics of COVID-19 in a tertiary health facility in Northeast Nigeria. *Niger J Med* 2021;30:334-8.

Submitted: 20-Jan-2021

Revised: 06-Mar-2021

Accepted: 30-Apr-2021

Published: 19-Jun-2021

Access this article online

Quick Response Code:



Website:
www.njmonline.org

DOI:
10.4103/NJM.NJM_19_21

protein. This finding indicates the virus infects these cells, and therefore may imply the possibility of transmissibility of virus other than via respiratory droplets.^[5,7]

Given the various pulmonary and extrapulmonary manifestations of COVID-19, a report of clinical presentation in different localities is desirable. This study aimed to report the clinical characteristics of COVID-19 in a tertiary health institution in Northeast Nigeria.

METHODOLOGY

This study was conducted at the Federal Medical Centre Nguru, a tertiary health institution in Northeast Nigeria. The hospital is a designated treatment center for COVID-19. We reviewed the clinical records of 850 with clinical features suggestive of COVID-19 from March 14 to October 14, 2020. We abstracted the records of 55 laboratory-confirmed, symptomatic COVID-19 patients with documented clinical features of mild/moderate, or severe disease for analysis. Information obtained included biodata, clinical presentations, vital signs, pulse oximetry, laboratory investigations, and pre-existing health condition. The clinical spectrum of COVID-19 due to SARS-CoV-2 infection was classified according to the Treatment Guidelines adopted from the WHO-China joint mission^[8] and Emergency Response Team on COVID-19^[9] as follows:

Asymptomatic or presymptomatic infection

Individuals who test positive for SARS-CoV-2 using a virologic test (i.e. a nucleic acid amplification test or an antigen test) but who have no symptoms that are consistent with COVID-19.

Mild illness

Individuals who have any of the various signs and symptoms of COVID-19 (e.g. fever, cough, sore throat, malaise, headache, muscle pain, nausea, vomiting, diarrhea, loss of taste and smell) but who do not have shortness of breath, dyspnea, or abnormal chest imaging.

Moderate illness

Individuals who show evidence of lower respiratory disease during clinical assessment or imaging and who have the saturation of oxygen (SpO₂) ≥94% on room air at sea level.

Severe illness

Individuals who have SpO₂ <94% on room air at sea level, the ratio of arterial partial pressure of oxygen to fraction of inspired oxygen (PaO₂/FiO₂) <300 mm Hg, respiratory frequency >30 breaths/min, or lung infiltrates >50%.

Critical illness

Individuals who have respiratory failure, septic shock, and/or multiple organ dysfunctions.

COVID-19 infection was confirmed based on real-time reverse transcriptase-polymerase chain reaction (rRT-PCR) assay for nasal and pharyngeal swab specimens. RNA was extracted

from clinical specimens and determined by rRT-PCR targeting the open reading frame 1ab gene of SARS-CoV-2.^[1]

Statistical analysis

Categorical variable results are presented as numbers and percentages. Continuous variables are presented as mean ± standard deviation (SD), means, maximums, and minimums as appropriate. Chi-squared (or Fisher's exact) tests were used for categorical variables. Statistical analysis was performed using IBM SPSS Statistics software (version 20.0; IBM, Armonk, NY, USA). A significance level of $P < 0.05$ was used.

RESULTS

Fifty-five symptomatic COVID-19 patients were evaluated in this study. Their mean age was 49.1 ± 16.3 (females 51.4 ± 15.6 , males 48.5 ± 17.2 , $P = 0.601$) with females constituting 47.2% of the studied patients. Table 1 shows the presenting symptoms of these patients. Fever (87.3%), cough (67.3%), sore throat (49.1%), and rhinorrhea (41.8%) were the most common clinical feature. Other features included difficulty in breathing (25.5%) and ageusia (14.6%). Gastrointestinal symptoms such as diarrhea, vomiting, and abdominal pain were seen in 10.9%, 18.2%, and 9.1%, respectively [Table 1]. Of the studied patients, 21 (8 females, 13 males) had preexisting health conditions. The mean capillary oxygen saturation at room air (SPO₂) of patients was 93.4 (SD, 17.2). Table 2

Table 1: Clinical features of coronavirus disease 2019

	n (%)
Cough	37 (67.3)
Sore throat	27 (49.1)
Fever	48 (87.3)
Difficulty in breathing	14 (25.5)
Running nose	23 (41.8)
Vomiting	10 (18.2)
Nausea	8 (14.6)
Abdominal pain	5 (9.1)
Diarrhea	6 (10.9)
Ageusia	8 (14.6)
Anosmia	-

Table 2: The proportion of preexisting health condition and mean capillary oxygen saturation

	n (%)
Sex, female	8
Mean SPO ₂ at presentation	93.4 (17.2)
Underlying comorbidity	21 (38.2)
Number of comorbidities	
1	8 (14.6)
2	11 (20)
≥3	3 (5.5)

SPO₂: Oxygen saturation at room air

depicts the proportion of pre-existing health condition and mean capillary oxygen saturation. Twenty-one (38.2%) patients had a pre-existing health condition. The distribution of patients across a defined age group is as depicted in Figure 1. Patients aged 36–45 years constituted 21.8%, while 10.9% were older than 65 years. Figure 2 shows the stratification of the participants based on occupation. House wives constituted 38% of the studied population. Figure 3 depicts the proportion of pre-existing/comorbid health conditions. Chronic kidney disease was the most common; it was seen in 34% of patients; other common conditions included hypertensive heart disease (24%) and diabetes mellitus (16%).

The comparison of gender variation, clinical features and proportion of pre-existing health condition(s) in this study, and two similar previous reports is presented in Table 3.

There was a significant variation in the proportion of participants with respect to gender ($P = 0.026$) in the three studies. Similarly, there was a statistically significant difference in the proportion of patients that presented with fever ($P = 0.021$), diarrhea ($P = 0.035$), and shortness of breath ($P = 0.000$) across all three studies. There was no observed significant variation in the proportion of patients that presented with fever ($P = 0.071$) and diarrhea ($P = 0.137$) between this study and Huang *et al.* However, there was a statistically significant variation in the proportion of patients

that presented with difficulty in breathing ($P = 0.000$), between this study and Chen *et al.* [Table 3].

DISCUSSION

Fever 87.3%, cough 67.3%, sore throat (49.1%), rhinorrhea (41.8%), and difficulty in breathing (25.5%) were the common feature of COVID-19 in this study. Our finding is similar to previous studies that reported respiratory symptoms as the most common manifestation of COVID-19.^[7-9] The clinical feature of COVID-19 has been reported to vary widely, but often resembles viral pneumonia, and the severity of illness ranges from mild to severe. Earlier studies have reported clinical manifestations to include non-specific mild symptoms such as anorexia, confusion, dizziness, sore throat, rhinorrhea, and sputum production.^[6-9] Approximately 80% of patients have been reported to present with mild illness, 14% present with severe illness, and 5% present with a critical illness.^[8,9]

COVID-19, is a potentially severe acute respiratory infection caused by SARS-CoV-2. SARS-CoV-2 RNA virus has been detected from a nasopharyngeal aspirate of COVID-19 patients.^[4,9] The tissues of the respiratory tract, such as oral and nasal mucosa and nasopharynx, is endowed with angiotensin-converting enzyme 2 receptor, which serves as a

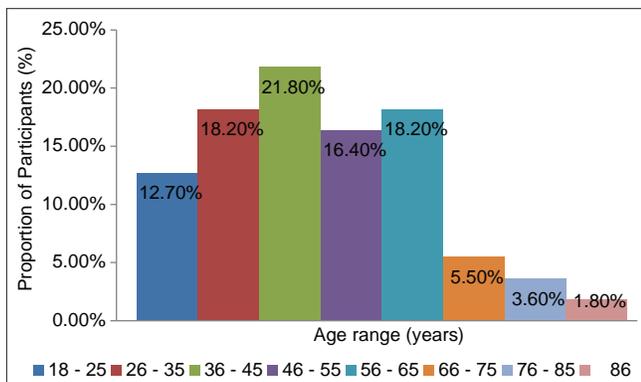


Figure 1: Age distribution of the studied patients

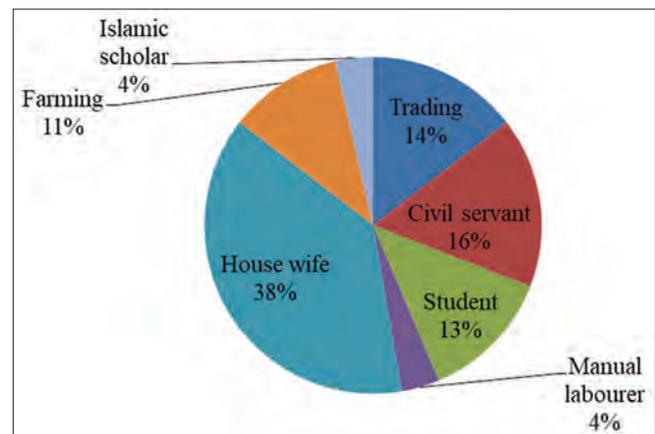


Figure 2: Distribution of participants based on occupation

Table 3: Intergroup comparison between this study and two similar publications

Characteristics	This study (55 cases)	Huang <i>et al.</i> ^[10] (49 cases)	Chen <i>et al.</i> ^[11] (99 cases)	Difference between groups (P)
Age, n (%)	49.1 (16.3)	49 (17.0)	55.5 (17.7)	-
Sex, female, n (%)	28/55 (47.2)	11/41 (27)	32 (32.0)	0.026 [®]
Preexisting health condition, n (%)	21/55 (38.2)	13/41 (32)	50 (51)	0.085
Fever, n (%)	48/55 (87.3)	40/41 (98)	82 (83)	0.021 [®]
Cough, n (%)	37/55 (67.3)	31/41 (76.0)	81 (82)	0.124
Difficulty in breathing/shortness of breath, n (%)	14/55 (25.5)	22/40 (55)	31 (31)	0.000 [®]
Diarrhoea, n (%)	6/55 (10.9)	1/38 (3)	2 (2)	0.035 [®]

[®]This study versus Huang 0.017; this study versus Chen 0.001; Huang versus Chen 0.018, [®]This study versus Huang 0.071; this study versus Chen 0.466; Huang versus Chen 0.018, [®]This study versus Huang 0.003; this study versus Chen 0.444; Huang versus Chen 0.000, [®]This study versus Huang 0.137; this study versus Chen 0.017; Huang versus Chen 0.827. The difference between groups was calculated by Fisher's exact test in R software

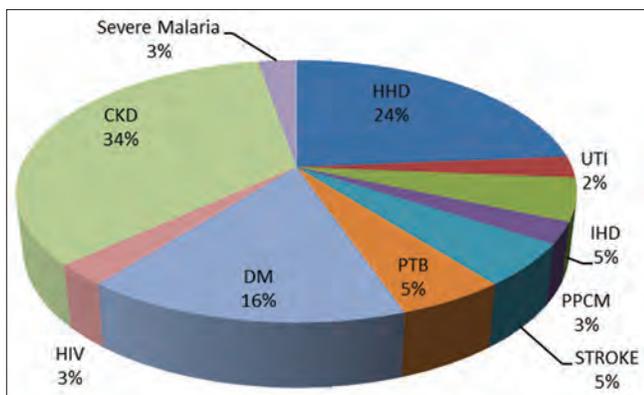


Figure 3: The proportion of comorbidities in studied participants. CKD (Chronic Kidney Disease), DM (Diabetes Mellitus), HHD (Hypertensive Heart Disease), IHD (Ischaemic Heart Disease), PTB (Pulmonary Tuberculosis), PPCM (Peripartum Cardiomyopathy), UTI (Urinary Tract Infection)

receptacle for SARS-CoV-2. Although coronavirus's primary target is the respiratory tract, it is known to involve other systems such as extrapulmonary manifestations.^[7-9]

The SARS CoV-2 has been detected from other sites indicating the possibility of its transmission in ways other than respiratory droplets. The extrapulmonary pathology of COVID-19 could be due to either extrapulmonary dissemination of the virus and its replication or widespread immune-pathological complications of the disease.^[5,6,9] The incidence of gastrointestinal manifestation of COVID-19 has been reported to range from 12% to 61%.^[12,13] In a meta-analysis of 29 studies, the pooled prevalence of individual symptoms reported was anorexia (21%), nausea and vomiting (7%), diarrhea (9%), and abdominal pain (3%).^[14] In this study, vomiting (18.2%) was the most common gastrointestinal symptom; others included diarrhea (10.9%), nausea (14.6%), and abdominal pain (9.1%). A higher prevalence of gastrointestinal symptoms at presentation to be associated with a 70% increased risk of the detection of SARS-CoV-2.^[16] However, gastrointestinal bleeding appears to be a rare feature of COVID-19, despite the possible risk of bleeding from prolonged mechanical ventilation, thrombocytopenia or the use of systemic anticoagulation.^[16] Preexisting health conditions (e.g. hypertension, diabetes, cardiovascular disease) were mostly seen in patients aged >45 years, who also constituted the majority (91.4%) of patients in this study. Our finding is similar to previous studies that reported a higher incidence of both comorbidities and the disease in older patients.^[17-19]

The clinical features of COVID-19 have been shown to vary in several reports.^[10,11,20] We compared the incidences in this report and findings from two similar studies.^[10,11] We found that the incidence of fever ($P = 0.021$), diarrhea ($P = 0.035$),

and shortness of breath ($P = 0.000$) showed a statistically significant difference across the studies. The proportion of patients that presented with fever ($P = 0.071$) and diarrhea ($P = 0.137$) between this study and Huang *et al.*^[10] were comparable. Conversely, there was a statistically significant difference in the proportion of patients that presented with fever ($P = 0.001$) in this study and Chen *et al.*^[11] The wide variation in the clinical pattern of presentation in different setting suggests that COVID-19 has a broad spectrum of manifestation.

Limitations of the study

Although large enough to conduct valid comparisons with similar previous reports, the sample size used in this study remains limited; larger studies should be performed to further characterize clinical features in COVID-19 patients. The retrospective design of this study has the potential for bias. Nonetheless, we made systematic efforts to obtain a thorough and detailed history from the medical record of each patient in this study.

CONCLUSION

Respiratory symptoms are the most presentation of COVID-19 in our setting. However, some patients also presented with additional extrapulmonary symptoms. A significant proportion, 38.2%, of symptomatic COVID-19 patients had preexisting health conditions in this study.

Recommendation

The extrapulmonary features of COVID-19, as observed in this study, underscore the need to consider expanding the case definition.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

REFERENCES

1. Wang D, Hu B, Hu C, Zhu F, Liu X, Zhang J, *et al.* Clinical characteristics of 138 hospitalized patients with 2019 novel coronavirus-infected pneumonia in Wuhan, China. *JAMA* 2020;323:1061-9.
2. Gupta A, Madhavan MV, Sehgal K, Nair N, Mahajan S, Sehrawat TS, *et al.* Extrapulmonary manifestations of COVID-19. *Nat Med* 2020;26:1017-32.
3. Zhang W, Du RH, Li B, Zheng XS, Yang XL, Hu B, *et al.* Molecular and serological investigation of 2019-nCoV infected patients: Implication of multiple shedding routes. *Emerg Microbes Infect* 2020;9:386-9.
4. Lu R, Zhao X, Li J, Niu P, Yang B, Wu H, *et al.* Genomic characterization and epidemiology of 2019 novel coronavirus: Implications for virus origins and receptor binding. *Lancet* 2020;395:565-74.
5. Arawomo AO, Ajibade AI, Adeniyi B, Aigbirior J, Erhabor GE. Coronavirus disease 2019 (COVID-19): Clinical perspectives and ongoing challenges. *West Afr J Med* 2020;37:295-316.
6. Africa CDC. Outbreak Brief: Coronavirus 2019 (COVID-19) Pandemic. Africa CDC: Centre for Disease Control and Prevention; 2020. p. 1-7.
7. Parasa S, Desa MI, Chandrasekar VT, Pate HK, Kennedy KF, *et al.* Prevalence of gastrointestinal symptoms and fecal viral shedding in patients with coronavirus disease 2019. A systematic review and

- meta-analysis. *JAMA Netw Open*. 2020;3:e2011335. doi: 10.1001/jamanetworkopen.2020.11335.
8. Novel Coronavirus Pneumonia Emergency Response Epidemiology Team. The epidemiological characteristics of an outbreak of 2019 novel coronavirus diseases (COVID-19) in China. *Zhonghua Liu Xing Bing Xue Za Zhi* 2020;41:145-51.
 9. Aylward B, (WHO); Liang W (PRC). Report of the WHO-China Joint Mission on Coronavirus Disease 2019 (COVID-19). 16 – 24th February 2020.
 10. Huang C, Wang Y, Li X, Ren L, Zhao J, Chu H, Hu Y, *et al.* Clinical features of patients infected with 2019 novel coronavirus in Wuhan, China. *Lancet* 2020;395:497-506.
 11. Chen N, Zhou M, Dong X, Qu J, Gong F, Han Y, *et al.* Epidemiological and clinical characteristics of 99 cases of 2019 novel coronavirus pneumonia in Wuhan, China: A descriptive study. *Lancet* 2020;395:507-13.
 12. Pan L, Mu M, Yang P, Sun Y, Wang R, Yan L, *et al.* Clinical characteristics of COVID-19 patients with digestive symptoms in Hubei, China: A descriptive, cross-sectional, multicenter study. *Am J Gastroenterol* 2020;115:766-73.
 13. Cao B, Wang Y, Wen D, Liu W, Wang J, Fan G, *et al.* A trial of lopinavir-ritonavir in adults hospitalized with severe COVID-19. *N Engl J Med* 2020;382:1787-99.
 14. Mao R, Qiu Y, He JS, Tan JY, Li XH, Liang J, *et al.* Manifestations and prognosis of gastrointestinal and liver involvement in patients with COVID-19: A systematic review and meta-analysis. *Lancet Gastroenterol Hepatol* 2020;5:667-78.
 15. Pointner H, Flegel U. Treatment of exocrine pancreatic insufficiency with fungal lipase (author's transl). *Arzneimittelforschung* 1975;25:1833-5.
 16. Nobel YR, Phipps M, Zucker J, Lebowitz B, Wang TC, Sobieszczek ME, *et al.* Gastrointestinal symptoms and COVID-19: Case-control study from the United States. *Gastroenterology* 2020;159:373-5.e2. doi: 10.1053/j.gastro.2020.04.017.
 17. Arentz M, Yim E, Klaff L, Lokhandwala S, Riedo FX, Chong M, *et al.* Characteristics and outcomes of 21 critically ill patients with COVID-19 in Washington State. *JAMA* 2020;323:1612-4.
 18. Onder G, Rezza G, Brusaferro S. Case-fatality rate and characteristics of patients dying in relation to COVID-19 in Italy. *JAMA* 2020;323:1775-6.
 19. Wu Z, McGoogan JM. Characteristics of and important lessons from the coronavirus disease 2019 (COVID-19) outbreak in China: Summary of a report of 72 314 cases from the Chinese center for disease control and prevention. *JAMA* 2020;323:1239-42.
 20. Chan JF, Yuan S, Wang KK, Chu H, Yang J, Zhang L, *et al.* A familial cluster of pneumonia associated with the 2019 novel coronavirus indicating person-to-person transmission: A study of a family cluster. *Lancet* 2020;395:514-23.