

COVID-19 in Suspected Cases at Federal Medical Centre Keffi.

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ABSTRACT

This study aimed to determine the epidemiological and clinical features of COVID-19 infection among suspected cases accessing healthcare at Federal Medical Centre Keffi Nasarawa State, Nigeria between September 2020 and December 2021. The study was retrospective and utilized information from 1929 patients of both genders and of different age groups including their clinical data from the hospital's electronic medical records and patient's case investigation forms. Nasopharyngeal swabs were collected from the subjects and tested using the GeneXpert proprietary platform. The study revealed that 502 of the subjects tested positive for COVID-19. The Chi-Square test shows that there was a significant relationship between the infection and age of the subjects. Also, the study revealed that females were infected more compared to male subjects. Furthermore, the Chi-Square test revealed cough to be the predominant symptom. The study recommends that the Government should prioritize vaccination and targeted screening of vulnerable age groups who could either be at high risk of the infection or serve as carriers. The use of face masks is highly recommended as coughing was found to be associated with the infection. While gender was found to be significantly associated with COVID-19, the reason for this association is unclear, therefore, it is recommended that gender be put into consideration when designing intervention and screening programmes in future outbreaks. There is a need for further studies to understand the disease transmission dynamics which will help in forestalling future pandemics.

Keywords: Coronavirus disease 2019 (COVID-19); SARS-CoV-2; GeneXpert; Age; Gender; Symptoms.

INTRODUCTION

The Coronavirus Disease (COVID-19) is a respiratory disease caused by the Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) virus [1] The disease was first reported in Wuhan City, Hubei Province of China in December 2019. Initial cases of COVID-19 were described as pneumonia of unknown aetiology [2]. There are suggestions that the infectious agent may have originated from bats and pangolins [3, 4]. The virus is transmitted from person to person predominantly through droplets produced when an infected individual coughs or sneezes and through saliva or discharge droplets. COVID-19 is very contagious with clinical symptoms which include high fever, cough, dyspnoea, myalgia, fatigue, headache, normal or decreased leukocyte count, and radiographic evidence of pneumonia [1,2]. The mean incubation period of SARS-CoV-2 is 5 days, and symptoms can last for 6-41 days, with a mean of 14 days [5]. The patient's age and immune status play an important role in the observed symptoms, intensity of the disease, and duration. Patients with pre-existing conditions, such as diabetes and respiratory or cardiovascular disorders, are more susceptible to COVID-19 [6]. There have also been reported cases of mild to

asymptomatic infection in patients during its entire course, while others present severe symptoms that may lead to death. However, the reason for these diverse manifestations is unclear. Still, it has been suggested that certain host genetic factors, as well as viral genetic variations, may influence the clinical course and outcome of COVID-19 [7]. Since the first case of COVID-19 was reported in China, it continued to evolve and spread throughout the world to involve the majority, if not all, the countries including Nigeria [8]. The first case of COVID-19 reported in Nigeria, was an imported case from Italy that was confirmed on the 27th of February 2020 in Lagos, Southwest Nigeria which had a major impact on the already weak healthcare system in the country [9]. The pandemic has a large number of infected patients that far exceeded the equivalents of severe acute respiratory syndromes (SARS) and Middle East respiratory syndrome (MERS), though with a lower fatality rate. Nigeria is among the top 5 countries in Sub-Saharan Africa with the highest number of confirmed cases of COVID-19 [8,9]. COVID-19 was declared a global pandemic due to its wild spread worldwide by the World Health Organisation (WHO) on March 11th, 2020 [10]. A prevalence of 19.6% has been reported in Nasarawa state by [19]. This study is deemed timely as the world faces an unprecedented pandemic of this burden in modern history, stretching the health sector in human and material resources as there a need to investigate the disease dynamics. The objective of this research is to determine the prevalence of COVID-19 in the study area and to identify demographic and clinical characteristics associated with the infection as the pandemic exposes the county's vulnerability to globalization and worsening public health system. Also, this study seeks to provide data and information that could inform policy and healthcare decisions related to COVID-19 prevention and control in the study area and in the country at large.

METHODOLOGY

Study Area

This study was conducted in Keffi, approximately 69.5km from Abuja, the Federal Capital Territory, and 124km from Lafia, the capital of Nasarawa state. Keffi is located between latitude 8° 49' 24" N of the equator and longitude 7° 52' 35" E and is situated at an altitude of 850m above sea level [11, 12, 13].

Study Design and Population

This was a retrospective study that used the medical records of suspected and confirmed COVID-19 patients who presented to the hospital from September 2020 to December 2021.

Inclusion and Exclusion Criteria

All clients who presented for the first time and met the case definition at Federal Medical Center, Keffi (FMCK) from September 2020 to December 2021 were included.

While cases of reinfection (i.e., people who have had the infection more than once) and cases of repeat tests and follow-up were excluded.

Ethical Approval

The ethical approval for this research was obtained from the Health Research Ethics Committee, Federal Medical Centre Keffi with certificate number FMC/KF/HREC/02631/24.

Method

A retrospective analysis was conducted using data retrieved from the laboratory database, including 1929 patient results between September 2020 and December 2021, as well as age, sex, and clinical symptoms. All

the nasopharyngeal/oropharyngeal specimens collected from the patients were tested using the GeneXpert proprietary automated sample processing real-time RT-PCR for detection of viral E gene and the N2 region of the N gene as its SARS-CoV-2- specific target within 50 minutes as described by [13, 14, 15].

Data Analysis

The data obtained from this study will be analysed using the Chi-square test by the use of Statistical Package for Social Sciences (SPSS) version 23.0 (IBM, Armonk, NY, USA) statistical software. Values obtained will be considered significant at 95% probability (i.e., $p \leq 0.05$).

RESULTS AND DISCUSSION

Table 1: Participants Demographics

Variables	Number of participants	Percentage (%)
Male	1054	54.64%
Female	875	45.36%
Age (Years)		
0-10	206	10.68%
11-20	220	11.40%
21-30	481	24.94%
31-40	479	24.83%
41-50	287	14.88%
51-60	168	8.71%
61-70	60	3.11%
71-80	19	0.94%
81-90	8	0.41%
>90	1	0.05%
TOTAL	1929	100%

An overview of the subject’s demographics shows that there were more males tested for COVID-19 1054 (54.64%) compared to females 875 (45.36%) suggesting that male subjects were readily available to be tested or presented themselves to the hospital more than the females. Also, participants within the age group 21-30 had the highest infection rate 481 (24.94%). This could be as a result of the fact that subjects of this age group are care givers to their elderly parents and are more active outdoors [59], [60].

Table 2. Prevalence of COVID-19 Concerning Gender

Gender	Number Examined	Number Negative	Number Positive	Prevalence (%)	P-value
Male	1054	816	238	21.8%	
Female	875	611	264	30.2%	0.000
TOTAL	1929	1427	502	26.0%	

The study shows a significant relationship between rate of COVID-19 infection and gender ($P=0.05$). Of the 875 females tested, 265 were positive for COVID-19 (30.2%), while 238 males tested positive out of 1054 with a prevalence of 21.8 %. This is consistent with a high rate of infection among females reported in Nigeria by [23, 26] and other parts of the world by [34, 35, 36, 37]. Intriguingly, the reverse was reported by

a majority of researchers in Nigeria [21, 24, 32, 38, 39, 40, 41], across Africa and other continents [42, 43, 44, 45, 46, 47, 48]. There is no clear-cut reason for this disparity, however, studies have reported difference in disease prevalence concerning gender could be a result of lifestyle/behavioural, occupational, genetic, immunological, and hormonal factors that may predispose one to the infection [31, 35, 36, 39,45, 48, 49, 50]. Furthermore, the relationship between COVID-19 and the age difference of participants was examined from ages 0 to those greater than 90 years. Those within the age group of 21-30 had 141 positive cases (29.3%), followed by those aged 31-40 with reported cases of 136(28.4%) while the least prevalence was seen among those greater than 90 years 0 (0%) with $P=.05$ as seen in Table 3. This is consistent with several reports [23, 32, 38, 39, 40, 41, 43, 48, 55, 56]. However, infections among persons aged 41 and above have also been reported [19, 21, 22, 41, 53, 55, 57, 58]. The findings of our study may be attributed to the fact that young adults are the primary caregivers to their children and parents when they get sick, and also because they engage more in social activities that predispose them to the infection. This is consistent with reports by [59], [60].

Table 4: Prevalence of COVID-19 Concerning Symptoms

Symptom	Number Positive	Prevalence (%)	P-value
Fever	262	13.6%	
Sore throat	155	8.0%	
Runny nose	188	9.7%	
Coughing	323	16.7%	
Vomiting	68	3.5%	
Nausea	57	3.0%	0.001
Diarrhoea	47	2.4%	
Shortness of breath	96	5.0%	
Loss of taste	107	6.0%	
Loss of smell	94	4.9%	

Fever 262(13.6%), sore throat 155(8.0%), runny nose 188(9.7%), coughing 323(16.7%), vomiting 68 (3.5%), nausea 57 (3.0%), diarrhoea 47 (2.4%), shortness of breath 96 (5.0%), loss of taste 107 (6.0%) and loss of smell 94 (4.9%) respectively were the symptoms reported in this study. Coughing had the highest prevalence of 323(16.7%) while the least reported prevalence was diarrhoea 47(2.4%) with $P=.05$ as shown in Table 4. A Similar prevalence of different symptoms associated with COVID-19 has been reported previously by [2, 4, 9, 21, 45, 48, 52, 53, 54]. Coughing has been reported in several studies as an important symptom in COVID-19 infection as it plays a major role in the disease transmission. The consistency in the prevalence of symptoms in Nigeria and globally may be a result of one or more of these symptoms having to be observed to meet the case definition for COVID-19 testing [13, 15, 41].

CONCLUSION

The COVID-19 pandemic has a large number of infected patients that far exceeded the equivalents of severe acute respiratory syndromes (SARS) and Middle East respiratory syndrome (MERS), though with a lower fatality rate. Nigeria is among the top 5 countries in Sub-Saharan Africa with the highest number of confirmed cases of COVID-19. This study found that females were more infected than males, while subjects aged 21 to 40 tested positive higher than that observed in other age groups. Also, coughing was found to be significantly associated with COVID-19 infection. These variables may play a significant part in the disease distribution in the study area.

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COMPETING INTERESTS

The authors have declared that there are no existing competing interests.

AUTHORS' CONTRIBUTIONS

This work was carried out in collaboration among all authors. Authors TU and II designed the study, compiled participant's data, carried out the statistical analyses, and wrote the first draft of the manuscript. Authors, AE, and OE designed the study and managed literature searches, Authors OE, OM and MU wrote the study protocols, and managed the data and analyses of the study. All authors read and approved the final manuscript.

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