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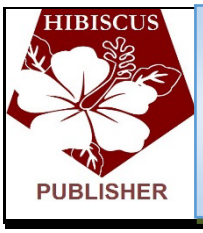

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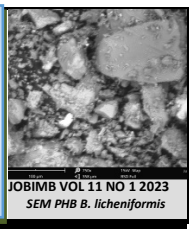

Socio-Demographic and Clinical Characteristics and Outcomes of COVID-19 Patients in Kaduna State

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ABSTRACT

Advancing age and male sex were found to contribute to the fatal presentation and outcome of COVID-19 infection. Identifying factors associated with severity of presentation and mortality could improve management of COVID-19. A descriptive study to describe sociodemographic and clinical characteristics/profile and outcome of COVID-19 patients in Kaduna state with highest cases in Northern Nigeria was conducted to explore determinants of severity and overall mortality. A retrospective cross-sectional review of clinical records of 902 COVID-19 patients from 27th March, 2020 to 31st December, 2021 in the 4 isolation centers in the state was conducted. Data was analyzed using SPSS 26 and STATA SE 12 at $P \leq 0.05$.Out of the nine-hundred and two (902) that satisfied the inclusion criteria, the majority were 40 years and below 496 (55%), mean age ± S.D was 40.1 ± 16.0. Majority were Males 524 (58.1%), Christians 494 (54.8%), and Non-southern Kaduna tribes 593 (65.7%). The duration of illness was found to be prolonged among the elderly males (9.36 ± 3.79) compared to females (8.5 ± 3.20days). Bivariate analysis revealed that age ($X^2 = 51.20$ P=0.0001), Religion ($X^2 = 6.51$ P=0.011), Marital status ($X^2 = 7.89$ P=0.005), occupation ($X^2 = 7.80$ P=0.005) and presence of comorbidities significantly affected the severity of clinical presentation and overall mortality among COVID-19 patients. Sex was only found to have an effect on severity of clinical symptoms ($X^2 = 9.90$ P=0.002), but not overall mortality ($X^2 = 2.24$ P=0.13). Age, religion, marital status, occupation and presence of comorbidity were predictors of worst clinical characteristics and mortality of COVID-19 in Kaduna State.

INTRODUCTION

Coronavirus Disease 2019 (COVID-19) or Severe Acute Respiratory Syndrome Coronavirus-2 (SARS-COV-2) is a severely fatal disease first identified in Wuhan China in 2019 [1]. It has since spread globally and was declared pandemic in March, 2020 by the World Health Organization [2]. Several factors have been identified globally to be the predicting factors of worst clinical outcomes and mortality. Severe COVID-19 infection has been reported across advanced age, male sex and low socio-economic status. A survey on the impacts of sex and gender on the outcome of COVID-19 in Europe revealed higher mortality among infected men and with concomitant severe outcome among aged men [3]. A meta-analysis by Augusta *et al.* [4] found that men have a higher chance of dying from COVID-19 infection than their female counterpart in respective settings (either hospitalized or not). It was suggested to be as a result of the presence of toll-like receptor 7 on the X chromosome which

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serves as a defense against viral infections [4]. A survey by Hussain *et al*. [5] revealed gender disparity among COVID-19 infected individuals with worst clinical outcomes and increased mortality among men. Some of the factors proposed were sex hormones, intrinsic variation in the innate and adaptive immunity and genetic differences in the expression of immune regulatory genes between men and women [5].

A study conducted by Jamil *et al.* in Northeast India [6] and El Aidaoui *et al.* in Casablanca Morocco [7], revealed advancing age, male gender and presence of comorbidities among others as some predictors of poor outcomes of COVID-19 infection. Furthermore, a survey on the outcomes of COVID-19 in patients with thoracic malignancies in New York by gender and ethnicity, found a higher mortality among men and Hispanics, however with similar clinical severity between ethnic groups [8]. Another survey on the gender-based difference of COVID-19 in Taiwan found increased mortality, prolonged hospital stays and increased severity of presentation in men [9].

Several surveys attributed the presence of comorbidities notably hypertension, diabetes and cardiac disease as factors associated with worst clinical presentation, prolonged admissions and increased mortality among COVID-19 patients [10,11]. Therefore, there was a need to determine the socio-demographics and clinical characteristics and outcomes of COVID-19 infection in Kaduna state with the highest number of COVID-19 cases in northern Nigeria. This will enable policy makers and other stakeholders to pay more attention to the identified factors leading to worst clinical outcomes in order to provide a lasting solution.

MATERIALS AND METHODS

Site of study

The study was conducted at the Infectious Disease Control Centre (IDCC) in Kaduna, the capital of Kaduna State, in North Western Nigeria. The Kaduna State Infectious Disease Control Centre had four isolation centres at the time of this study; the Kakuri IDCC, Hamdala Alternative Isolation Center (HAIC), General Hospital Kafanchan and Zaria Hotel. The State had a total of 262 beds in the four Isolation centers. The response of the state to the COVID-19 pandemic was via nine pillars setup by the state Emergency Operation Centre (EOC). These pillars include Case Management, Risk communication, Logistics and Supplies, Epidemiology and Surveillance, Laboratory Services, Point of Entry (POE), Infection Prevention and Control, Coordination and Research.

Survey

The survey was a retrospective cross-sectional review of clinical records of all COVID-19 patients admitted from 27/03/2020 to 31/12/2021 in the four isolation centers. Patients with incomplete records and those managed at home were excluded from the study. A structured questionnaire was used to collect data on age, sex, date of onset, date of presentation, severity of symptoms, and final clinical outcome (Recovery or Death). The questionnaire also contained classification of the COVID 19 cases as mild, moderate and severe. A patient that was asymptomatic at presentation was classified as mild while a patient was classified as moderate if they presented with fever, cough, respiratory rate <30 breaths per minute, SPO2 >90% for adults and >92% for children and a patient with grunting respiration, respiratory rate >30 breaths per minute, spO2 <90% for adults and <92% for children requiring oxygenation was classified as severe [12].

Data analysis

Data analysis was done using IBM SPSS version 26 and Stata 12. Data was summarized using frequencies and percentages for categorical variables, mean and standard deviation for continuous variables, and bivariate analysis to explore determinants of poor outcomes.

Ethical permission

Ethical Permission (NHREC/17/03/2018) was obtained from the Kaduna state Ministry of Health Research Ethic Committee (HREC).

RESULTS

Out of the nine-hundred and two (902) that satisfied the inclusion criteria, the majority were found to be 40 year and below 496 (55%), mean age ± S.D. was 40.1 ± 16.0. The majority were Males 524 (58.1%), Christians 494 (54.8%), mostly Hausa 357 (39.6%) and non-southern Kaduna tribes 309 (34.3%). Found to be currently married 550 (61.0%), with tertiary education 612 (67.8%) and employed 551 (61.1%) (**Table 1**).
The duration of illness was found to be similar among males (8.52 ± 3.73 days) and females (8.1 ± 3.20days), but was found to be prolong among the elderly males (9.36 ± 3.79) compared to females (8.5 ± 3.20days). The presentation was mainly mild to moderate 817 (90.6%), with symptoms ranging from fever (82.7%), headache (75.5%), cough (78.7%), and fatigue (73.0%). Patients with comorbid conditions were 245 (27.2%) and the overall mortality rate was 5.9% (Table 2). Bivariate analysis revealed that age (X^2 = 51.20 P=0.0001), religion (X^2 = 6.51 P=0.011), marital status (X^2 = 7.89 P=0.005), occupation (X^2 = 7.80 P=0.005) and presence of comorbidities significantly affected the severity of clinical presentation and overall mortality among COVID-19 patients. Sex was only found to have an effect on severity of clinical symptoms (X^2 = 9.90 P=0.002 but had no effect on overall mortality (X^2 = 2.24 P=0.13). Tribe (X^2 = 0.119 P=0.73) and level of education (X^2 = 0.99 P=0.753), were not found to have any significant effect on the clinical presentation and outcome of COVID-19 patients in Kaduna state.

Table 1. Sociodemographic Characteristics of COVID-19 Patients admitted in Kaduna State Isolation Centers.

Sociodemographics	Frequency	Percentage (%)
AGE (Years)		
≤ 40	496	55
>40	406	45
SEX		
Male	524	58.1
Female	378	41.9
Religion		
Islam	408	45.2
Christianity	494	54.8
Tribe		
Hausa	357	39.6
Southern Kaduna	309	34.3
Igbo	81	9.0
Yoruba	66	7.3
*Others	89	9.8
Marital Status		
Married	550	61.0
Not Married	352	39.0
Level Of Education		
Below Tertiary	290	32.2
Tertiary	612	67.8
Occupation		
Employed	551	61.1
Unemployed	351	38.9

*Others: Nupe, Tiv, Itsekiri, Marghi

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Table 2. Clinical Characteristics of COVID-19 Patients admitted in Kaduna State Isolation Centers.

Clinical Characteristics	Frequency	Percentage (%)
Symptoms		
Present	371	41.1
Absent	531	58.9
Fever	307	82.7
Headache	280	75.5
Cough	292	78.7
Fatigue	271	73.0
Sore throat	179	48.2
Shortness of Breath	134	36.1
Anosmia	125	33.7
Loss of smell	101	27.2
Presentation		
Mild/moderate	817	90.6
Severe	85	9.4
Comorbidity		
Present	245	27.2
Absent	657	72.8
Outcome		
Recovered	849	94.1
Died	53	5.9

Table 3. Relationship between Sociodemographic Profiles and Severity of Clinical Presentation of COVID-19 Patients in Kaduna State.

Sociodemographics	Severity		Chi-Square	P-value
	Severe	Not Severe		
AGE (Years)				
≤ 40	7 (1.4)	39 (98.6)	92.88	0.0001
>40	78 (19.1)	28 (80.9)		
Sex				
Male	63 (22.0)	51 (88.0)	9.90	0.002
Female	22 (5.8)	56 (94.2)		
Religion				
Islam	29 (7.1)	79 (92.9)	4.68	0.031
Christianity	56 (21.3)	38 (88.7)		
Tribe				
Non-Southern Kaduna	54 (9.1)	39 (90.9)	0.20	0.65
Southern Kaduna	31 (10.0)	78 (90.0)		
Marital Status				
Married	74 (13.5)	76 (86.5)	26.8	0.001
Not Married	11(3.1)	41 (96.9)		
Level Of Education				
Below Tertiary	22 (7.6)	58 (92.4)	1.69	0.194
Tertiary	63 (10.3)	49 (89.7)		
Occupation				
Employed	68 (12.3)	83 (87.7)	14.12	0.001
Unemployed	17 (4.8)	34 (95.2)		

Table 4. Relationship between Sociodemographic Profiles and Outcome of COVID-19 Patients in Kaduna State.

Sociodemographics	OUTCOME		Chi-Square	P-value
	Recovered	Died		
AGE (Years)				
≤ 40	492 (99.2)	4 (0.8)	51.2	0.0001
>40	357 (87.9)	49 (12.1)		
Sex				
Male	488 (93.1)	36 (6.9)	2.24	0.13
Female	361 (95.5)	17 (4.5)		
Religion				
Islam	393 (96.3)	15 (3.7)	6.52	0.011
Christianity	456 (92.3)	38 (7.7)		
Tribe				
Non-Southern Kaduna	557 (93.9)	36 (6.1)	0.119	0.73
Southern Kaduna	292 (94.5)	17 (5.5)		
Marital Status				
Married	508 (92.4)	42 (7.6)	7.89	0.005
Not Married	341 (96.9)	11 (3.1)		
Level Of Education				
Below Tertiary	274 (94.5)	16 (5.5)	0.99	0.753
Tertiary	575 (94.0)	37 (6.0)		
Occupation				
Employed	509 (92.4)	42 (7.6)	7.8	0.005
Unemployed	340 (96.9)	11 (3.1)		
Comorbidity				
Present	199 (81.2)	46 (18.8)	101.2	0.0001
Absent	650 (98.9)	7 (1.1)		

DISCUSSION

The survey on the sociodemographic characteristics and clinical characteristics and outcomes of COVID-19 patients in Kaduna state, revealed majority of the patients admitted in Kaduna state were mild to moderate cases. This corroborates the findings of Jamil *et al.* in Northeast India [6], Albadawy *et al.* in Egypt [14], Osibogun *et al.* in Lagos [13], Oyefabi *et al.* in Kaduna [15] that most COVID-19 infections were mild to moderate in presentation. However, advancing age, religion, sex, marital status and occupation were found to be associated with severe clinical presentation in this study. This agrees with the findings of Whisenant *et al.* in New York City [8] and El Aidaoui *et al.* [7] that advancing age and male gender had a significant effect on the worst clinical presentation of COVID-19.

Religion, marital status and occupations were not explored in other studies as predictors of clinical severity. The duration of symptoms in this study was found to be prolonged with advancing age and more among elderly men than women. Furthermore, the study found that age, religion, marital status, presence of comorbidities and occupation contribute to mortality among COVID-19 patients. This corroborates with findings of Jamil *et al.* in Northeast India [6], El Aidaoui *et al.* [7], Alkundi *et al.* [16] and Mohan *et al.* [17] on the effect of age and presence of comorbidities as determinants of worst outcome of COVID-19.

Though other sociodemographic factors were not explored in several other studies. Sex was not found to affect mortality; this contradicts several studies by Hussain *et al*. [5] and Kuo *et al.* [9] that revealed an increased mortality rate among men. Even though the studies could not specifically identify the reasons for the observed differences in the clinical outcomes across gender, several speculations were suggested like sex hormones, x-chromosomal factors, and inherent innate and adaptive immunity as protective factors for women. In conclusion, the findings of this study showed significant effects of age, marital status, occupation, presence of comorbidities and religion on the severity of clinical presentation and clinical outcome of COVID-19 infection. However, gender was only found to affect the severity of presentation but not overall mortality, while Tribe and Level of education were not found to affect any of the clinical outcomes or mortality. There is a need for policymakers and other relevant stakeholders to come up with policies targeting critical factors such as advancing age, presence of comorbidities and so on among the infected individuals in order to curtail the pandemic.

CONFLICTING INTEREST

Nil

AUTHORS' CONTRIBUTION

Data collection: Usman Idris, Abubakar Sadiq Muazu, Fadila Maryam Isah, Ishaq Umar Muhammad
Conceptualization and Data Analysis: Usman Idris, Oyefabi Adegboyega Moses, Hajara Niima Kera, Halima Bello Manga
Manuscript writing: Usman Idris, Oyefabi Adegboyega Moses, Mahmood Dalhat, Ogunsina Modupe Arinola.
Manuscript review/Final writing: Usman Idris, Oyefabi Adegboyega Moses, M.A Saulawa.
All authors reviewed and accepted the final manuscript.

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REFERENCES

1. Vargas JRN. The COVID-19 pandemic. Rev Facul Med. 2020:68;7–8.
2. Almalki ZS, Khan MF, Almazrou S, Alanazi AS, Iqbal MS, Alqahtani A, et al. Clinical characteristics and outcomes among COVID-19 hospitalized patients with chronic conditions: A retrospective single-center study. J Multidiscip Healthc. 2020;13:1089–97.
3. Klein SL, Morgan R. The impact of sex and gender on immunotherapy outcomes. Biol Sex Differ. 2020;11(1):1–13.
4. Ortolan A, Lorenzin M, Felicetti M, Doria A, Ramonda R. Does gender influence clinical expression and disease outcomes in COVID-19? A systematic review and meta-analysis. Int J Infect Dis. 2020;99:496–504.
5. Alizadehsani R, Alizadeh Sani Z, Behjati M, Roshanzamir Z, Hussain S, Abedini N, et al. Risk factors prediction, clinical outcomes, and mortality in COVID-19 patients. J Med Virol. 2021;93(4):2307-2320.
6. Jamil M, Bhattacharya P, Barman B, Topno N, Barman H, Nongpiur VN, War G, Hynniewta Y, Saikia B, Naku N, Bhattacharya PK. Clinical and demographic profile of COVID-19 patients: a tertiary level hospital-based study from Northeast India. Cureus J Med Sci. 2021;13(10).
7. El Aidaoui K, Haoudar A, Khalis M, Kantri A, Ziati J, El Ghanmi A, Bennis G, El Yamani K, Dini N, El Kettani C. Predictors of severity in Covid-19 patients in Casablanca, Morocco. Cureus. 2020;12(9).
8. Whisenant J, Wong S, Torri V, Revuelta J, Halmos B, Ceresoli G, et al. P09.18 COVID-19 Outcomes in Patients with Thoracic Malignancies According to Gender and Ethnicity (TERAVOLT). J Thorac Oncol. 2021;16(3): S297.
9. Su YJ, Kuo KC, Wang TW, Chang CW. Gender-based differences in COVID-19. New Microbes New Infect. 2021; 42:1–6.
10. Richardson S, Hirsch JS, Narasimhan M, Crawford JM, McGinn T, Davidson KW, et al. Presenting Characteristics, Comorbidities, and Outcomes among 5700 Patients Hospitalized with COVID-19 in the New York City Area. JAMA - J Am Med Assoc. 2020;323(20).
11. Ramatillah DL, Isnaini S. Treatment profiles and clinical outcomes of COVID-19 patients at private hospital in Jakarta. PLoS One. 2021;16(4):e0250147.
12. Idris U, Oyefabi AM, Dalhat MM, Umar IM, Abdulmajid M, Gwamna J, et al. Treatment Outcomes in COVID-19 patients with comorbidities in Kaduna state, Northwestern Nigeria. Niger Health J. 2023;23(1):517–23.
13. Osibogun A, Balogun M, Abayomi A, Idris J, Kuyinu Y, Odukoya O, et al. Outcomes of COVID-19 patients with comorbidities in southwest Nigeria. PLoS One. 2021;16(3):p.e0248281.
14. Albadawy RM, Jadoon BA, Mogahed MM, Ibrahim ME, Essawy TS, Amin AMA, et al. The Impact of Comorbidities on the Outcomes of Egyptian COVID-19 Patients: A Follow-Up Study. J Environ Public Health. 2021;2021.
15. Oyefabi A, Musa S, Kambai H, Usman I, Gwamna J, Sheyin J, et al. Comparison of the Ivermectin and Lopinavir/Ritonavir Treatment Outcomes among COVID-19 Mild to Moderate Cases in Kaduna State. West Afr J Med. 2022;39(2).
16. Alkundi A, Mahmoud I, Musa A, Naveed S, Alshawwaf M. Clinical characteristics and outcomes of COVID-19 hospitalized patients with diabetes in the United Kingdom: A retrospective single centre study. Diabetes Res Clin Pract. 2020;165.
17. Mohan A, Tiwari P, Bhatnagar S, Patel A, Maurya A, Dar L, et al. Clinico-demographic profile & hospital outcomes of COVID-19 patients admitted at a tertiary care centre in north India. Indian J Med Res. 2020;152(1):61.

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