Original Research Article

UPTAKE AND SIDE EFFECTS PROFILE OF COVID-19 VACCINE AMONGST MEDICAL DOCTORS AT A TERTIARY HOSPITAL IN SOUTH-SOUTH NIGERIA

ABSTRACT

Aim: To determine the uptake of, and the incidence and pattern of side effects to the COVID-19 vaccine amongst medical doctors at the Niger Delta University Teaching Hospital, Okolobiri, Bayelsa state, Nigeria.

Study design: This was a descriptive cross-sectional study.

Place and duration of Study: This study was carried out among medical doctors at the Niger Delta University Teaching Hospital, Okolobiri, Bayelsa state, Nigeria, from 15th June to 30th July, 2021.

Methodology: Semi-structured questionnaires were used to obtain data from 102 participants recruited by consecutive sampling. Data obtained were the socio-demographic characteristics of the participants, the presence of co-morbidities and the presence of side effects to the COVID-19 vaccine for those vaccinated.

Result: Out of 102 medical doctors who participated in the survey, only 30 (29.4%) had received the COVID-19 vaccine and 26 of them (86.7%) reported different forms of side effects. Pain at the injection site was the commonest vaccine-associated side effect (76.7%). The first day after COVID-19 vaccination was the commonest time of onset of the reported side effects. There was no statistically significant relationship between COVID-19 vaccine side effects and presence of chronic medical conditions in the participants.

Conclusion: Uptake of COVID-19 vaccine among medical doctors was low and is worrisome. Incidence of COVID-19 vaccine side effects was high; however, the symptoms were mild to moderate. In the face of this challenging pandemic, COVID-19 vaccination still remains a safe means of ensuring protection against the disease.

KEYWORDS: *COVID-19 vaccine, Side effects, Medical doctors, Gender, Co-morbidities*

INTRODUCTION

COVID- 19 is an illness caused by a new virus called severe acute respiratory syndrome Corona virus 2 (SARS-CoV-2). It was identified first in the middle of an outbreak of respiratory illnesses in Wuhan City, Hubei province, China.[1] It was reported to WHO on the 31st of December 2019, declared a global health emergency by WHO on the 30th of January 2020 and declared a global pandemic by WHO on the 11th of March 2020.[2-4]

COVID-19 has serious deleterious effect globally. As of 30th June 2021, there were 181,344,224 confirmed cases of COVID-19 including 3,934,252 deaths reported to WHO globally.[5]Of these, Nigeria had 167,543 confirmed cases and 2,120 deaths as reported by Nigeria centre for disease control.[6] This put so much strain on health and global economy with increased unemployment rate; as more man power, infrastructure, equipment, drugs, consumables are needed to combat this pandemic. This effect is more in developing countries including Nigeria that has an already fragile economy and health system.

Since respiratory droplets carrying infectious virus is the principal mode of transmission, the following measures are employed to prevent the spread of COVID-19: washing of hands with soap and water or use of alcohol-based hand sanitizer; maintaining a safe distance from anyone who is coughing or sneezing; wearing of facemask; avoid touching eyes, nose and mouth; covering of nose and mouth with bent elbow or a tissue when coughing or sneezing; staying at home when feeling unwell; and seeking medical attention when having fever, cough, or difficulty in breathing.[7]

While observing these preventive measures, vaccination is key to ending this pandemic. There are about 52 candidate vaccines in human trials as at December 2020.[8] Pfizer/ bioNTech vaccine was the first to receive emergency validaton by the WHO on the 31th of December, 2020.[9] Others approved by WHO for emergency use include: AstraZeneca/Oxford vaccine, Johnson and Johnson vaccine, Moderna, Sinopharm, and Sinovac.[10]
Nigeria received her first batch of COVID-19 vaccine(AstraZeneca/Oxford vaccine) on the 2nd of March 2021.[11] As of 29th June, 2021, Two million, Two Hundred and Ninety-nine Thousand , Nine Hundred and Eighty-seven (2,299,987) people have received their first dose of COVID -19 vaccine while 1,209,591 people have received their second dose in Nigeria.[12] Bayelsa state flagged off COVID-19 vaccination on 12th of March 2021.[13]

Like other vaccines, COVID-19 vaccines are associated with some side effects which are mostly mild to moderate in severity and short lasting.[14,15] This include pain, redness and swelling at injection site; fever; fatigue; headache; muscle pain; chills; nausea; vomiting; diarrhoea; mild flu-like symptoms; joint pain; weakness; loss of appetite; malaise; cough; and facial swelling.[15,16] Others include transverse myelination, disorientation, hypersensitivity to light and noise, personality behaviour change. Severe allergic reactions have occurred though rarely to some COVID-19 vaccines.[14-16] Severe allergic reaction such as anaphylaxis is a potential but rare side effect with any vaccine.[16]

Medical personnel, the military and other essential workers in Nigeria were among the first to be given the vaccine because of the limited supply of the vaccine to the country.[16] It would be necessary to study the side effect profile of COVID-19 vaccine amongst vaccinated medical doctors because they would be in a good position to tell their experiences to other health care workers as well as their public. This study would also act as a reference tool for further research on COVID-19 vaccine uptake and side effects in Africans.

The study aimed at determining the uptake of, and the incidence and pattern of side effects to the COVID-19 vaccine amongst medical doctors at the Niger Delta University Teaching Hospital, Okolobiri, Bayelsa state, Nigeria.

METHODOLOGY

This was a descriptive cross-sectional study carried out among medical doctors at the Niger Delta University Teaching Hospital, Okolobiri, Bayelsa state, Nigeria, from 15thJune to 30th July, 2021. The hospital is one of the two tertiary hospitals in the state. It resides within the suburbs of the state and 0.69 km from the state capital, Yenagoa. There are approximately 154 medical doctors working at the facility.

Using the formula for calculating sample size in cross-sectional studies[17] and based on a prevalence of COVID-19 vaccination among health workers of 27.4% from another study in Yenagoa,[18] a sample size of 102 was derived for this study after adjusting for an anticipated non-response rate of 30%.A semi-structured questionnaire was used to obtain data from 102 participants by consecutive sampling.

RESULTS

Socio-demographic characteristics of participants

A total of one hundred and two medical doctors from the Niger Delta University Teaching Hospital, Okolobiri, Bayelsa state, Nigeria participated in the survey. Of the 102 participants, about three-fifths were males (62.7%) while females were 37.3% (Table1). Thirty-nine (38.2%), 45 (44.1%), and 12 (11.8%) medical doctors were in the third, fourth and fifth decades of life respectively (Table 1). Majority of the participants were single (62.7%) and Christians by religion (93.1%).

Chronic medical conditions among participants

Chronic non-communicable diseases (NCD) were reported among seventeen participants (16.7%). The NCDs included hypertension (11.8%), diabetes mellitus (2.9%) and asthma (2.9%).Other conditions (2.9%) reported were chronic inflammatory synovitis and rheumatoid arthritis (Table 2).

Table 1: Socio-demographic characteristics of participants

Characteristics	Frequency N = 102	Percent (%)
Sex		
Male	64	62.7
Female	38	37.3
Age group		
20 - 29 years	39	38.2
30 - 39 years	45	44.1
40 - 49 years	12	11.8
> 50 years	6	5.9
Marital Status		
Single	64	62.7
Married	38	37.3
Religion		

Christian	95	93.1
Others	7	6.9

Table 2: Chronic medical conditions among respondents

Characteristics	Frequency N = 102	Percent (%)
Chronic medical condition		
No chronic medical condition	85	83.3
Chronic medical condition present	17	16.7
Type of chronic medical condition		
Hypertension	12	11.8
Diabetes	3	2.9
Asthma	3	2.9
Sickle Cell Disease	1	1.0
Others*	3	2.9

*Others – Allergic drug reaction, rheumatoid disease, chronic inflammatory arthritis

COVID 19 vaccine uptake and reported side effects among respondents

Thirty (30) out of 102 medical doctors (29.4%) had taken the vaccine about 3 months after it was provided at the hospital for vaccination of medical personnel (Figure 1).

Of the 30 medical doctors who had taken the vaccine, 26 of them (86.7%) reported different forms of side effects (Table 3). The most common reported side effect was pain at the injection site, which was reported in 23 participants (76.7%). Other side effects included fever (60.0%), muscle and joint pain (46.7%), fatigue (40.0%) and headache (40.0%). Most of those (46.7%) who reported side effects reported it on day 1 after the injection (Table 3).

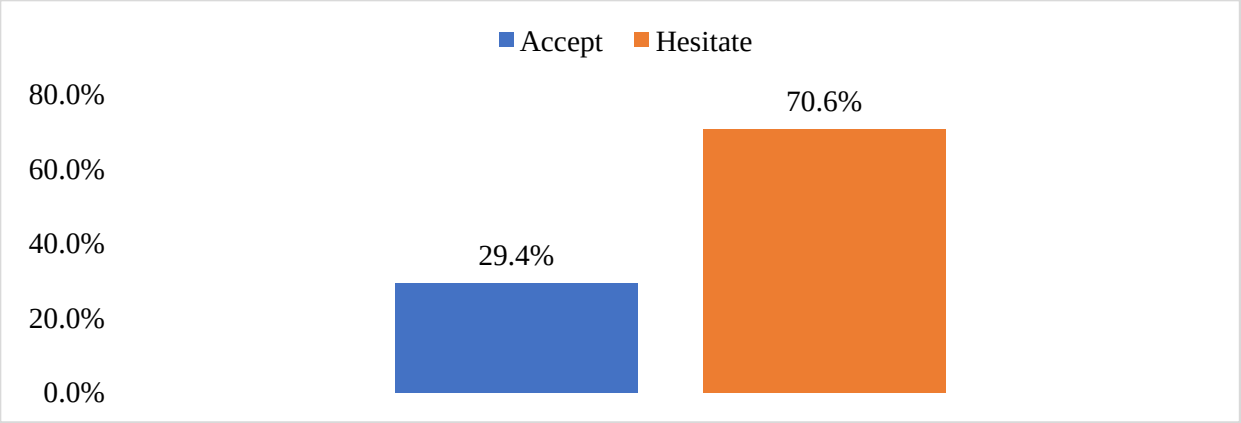

Figure 1: Vaccine uptake among Participants

Table 3: Reported side effects among respondents.

Side effects	Frequency N = 30	Percent (%)
Side effects reported	26	86.7
No side effect reported	4	13.3
Reported Site effects		
Pain in injection site	23	76.7
Fever	18	60.0
Muscle and joint pain	14	46.7
Fatigue	12	40.0
Headache	12	40.0
Chills	9	30.0
Nausea	3	10.0
Vomiting	1	3.3
Allergy	1	3.3
Day COVID-19 Side effects started		

Day 1	14	46.7
Day 2	11	36.7
Day 3 to 7	1	3.3

Association between chronic medical conditions and vaccine side effects

There was no significant difference ($p > 0.05$) in the occurrence of side effects among participants who reported chronic medical conditions and those who did not (Table 4)

Table 4: Association between chronic medical conditions and vaccine side effects

Characteristic	**Total N = 30 (%)**	**Chronic medical condition**		**Chi square**	**P-value**
		Present N = 3 (%)	**Absent N = 27 (%)**		
Side effect reported	26 (86.7)	3 (100.0)	23 (85.2)	0.37	.54
No side effect reported	4 (13.3)	0 (0.0)	4 (14.8)		
Pain at injection site	23 (76.7)	3 (100.0)	20 (74.1)	1.01	.31
No Pain at injection site	7 (23.3)	0 (0.0)	7 (25.9)		
Fever	18 (60.0)	3 (100.0)	15 (55.6)	2.22	.26
No fever	12 (40.0)	0 (0.0)	12 (44.4)		
Muscle/Joint pain	14 (46.7)	1 (33.3)	13 (48.1)	0.24	.63
No muscle/Joint pain	16 (53.3)	2 (66.7)	14 (51.9)		
Fatigue	12 (40.0)	1 (33.3)	11 (40.7)	0.06	.80

No Fatigue	18 (60.0)	2 (66.7)	16 (59.3)		
Headache	12 (40.0)	2 (66.7)	10 (37.0)	0.99	.55
No headache	18 (60.0)	1 (33.3)	17 (63.0)		
Chills	9 (30.0)	2 (66.7)	7 (25.9)	2.13	.53
No Chills	21 (70.0)	1 (33.3)	20 (74.1)		
Vomiting	1 (3.3)	0 (0.0)	1 (3.7)	0.12	.74
No Vomiting	29 (96.7)	3 (100.0)	26 (96.3)		
Nausea	3 (10.0)	0 (0.0)	3 (11.1)	0.37	.54
No nausea	27 (90.0)	3 (100.0)	24 (88.9)		

DISCUSSION

COVID-19 vaccine is that veritable tool in the war against COVID-19 pandemic, needed to break the chain of transmission of the infection and establish herd immunity, but its uptake is hindered by the fear of its side effects. COVID-19 vaccine side effects are yet to be well understood as the disease and its vaccine are novel.

More males than females participated in this study. This was due to the fact that more males than females presently work at the facility. Most of the participants were single and Christians as the study was carried out in a Christian-dominated locality.

From this study, most of the medical doctors had no chronic medical condition while the nature of chronic medical conditions reported by 16.7% of them was predominantly hypertension and diabetes. This is in keeping with similar studies done in Bayelsa, Lagos, China and Saudi Arabia respectively.[19-22]Presence of co-morbidities predisposes to adverse clinical outcomes in patients with COVID-19 and may result in greater disease severity when compared with those with no co-morbidity.[21]Thus, approved and authorized COVID-19 vaccines are especially important in people with underlying medical conditions.

COVID-19 vaccine uptake among medical doctors was low in this study; only 29.4% of the respondents took the vaccine. This low uptake rate is congruent with 27.7% recorded in Congo,[23] 37.4% in Jordan[24] and 39.3% in Ghana.[25] It is however not in consonance with 64.9%

and 86.2% recorded in Saudi Arabia and China respectively.[26,27]The low uptake rate among medical practitioners in this study is worrisome as it will likely affect the uptake of the vaccines by their patients. Maintaining confidence in vaccination depends on the interaction between patients and providers.[23]Attitude and utilization of vaccination by healthcare professionals (HCP) is a major factor that is consistently associated with patient acceptance and vaccination, adherence to vaccination schedules, and reduced hesitation/aversion.[28]In addition, vaccinated HCPs also have a noticeable effect on patients' decision to take a vaccine. The low uptake rate among the top echelon of the health care team may be related to the side effects of the vaccine and its overall safety. Thus, more vaccine clinical trials have to be done to provide more convincing data about the safety of this vaccine and settle all controversies about the drug once and for all.

The finding that 86.7% of those who took the vaccine in this study reported different forms of side effects is similar to studies done by Khaleduzzaman et al[29] and Oriji et al[19],however slightly higher than the rate in studies done by Hatmal et al[30] and Menni et al.[31]The most common reported side effect of pain at the injection site from this study was in consonance with a similar study among health workers in a sister facility by Oriji et al.[19] It however disagrees with other studies.[29,30] Other side effects include fever (60.0%), muscle and joint pain (46.7%), fatigue (40.0%) and headache (40.0%). Vaccines are designed to give immunity without the dangers of getting the disease however developing mild to moderate side effects is common. This is because the immune system is instructing the body to react in certain ways increasing blood flow so more immune cells can circulate, and it raises the body temperature in order to kill the virus. Mild-to-moderate side effects, like a low-grade fever or muscle aches, are normal and not a cause for alarm: they are signs that the body's immune system is responding to the vaccine, specifically the antigen and is gearing up to fight the virus. These side effects usually last for a few days.[31,32]

In this present study, most of the side effects (46.7%) were reported within the first day of receiving the vaccine. This is consistent with several other studies[29-32] but inconsistent with a study done in Bangladesh[29] where most symptoms were reported after the third day of vaccination. Spike proteins are viral protein found on the surface of viruses and also apply to vaccines which follow the natural process of viral infection to mount an immune response. An immediate response is elucidated by the innate immune system initiating an inflammatory response resulting in fever and pain at injection site while the adaptive immunity which produces T cells and antibodies provides protection on subsequent exposure hence a delayed response.

From this study, there was no association between COVID-19 vaccine side effects and presence of chronic medical conditions. Although side effects were reported among all participants with chronic medical condition in this study, it is likely due to the small number of vaccinated respondents and was not of statistical significance. This is consistent with the knowledge that COVID-19 vaccines may be administered to most people with underlying medical conditions.[1]

Experiencing side effects after getting vaccinated means the vaccine is working and the immune system is responding as it should.[16]After vaccination, it usually takes a few weeks for the body to build immunity against SARS-CoV-2. So, it's possible a person could be infected with SARS-CoV-2 just before or after vaccination and still get sick with COVID-19. This is because the vaccine has not yet had enough time to provide protection.

CONCLUSION

Uptake of COVID-19 vaccine among medical doctors was low and is worrisome, as it is likely to affect the uptake of the vaccines by their patients. Incidence of COVID-19 vaccine side effects was high; however, the symptoms were mild to moderate. The most common side effect was pain at injection site, observed especially within 24 hours of vaccination. In the face of this challenging pandemic, COVID-19 vaccination still remains a safe means of ensuring protection against the disease.

ETHICAL APPROVAL

This was obtained from the Research and Ethics Committee of the Niger Delta University Teaching Hospital, Okolobiri, Bayelsa.

COMPETING INTERESTS DISCLAIMER:

Authors have declared that no competing interests exist. The products used for this research are commonly and predominantly use products in our area of research and country. There is absolutely no conflict of interest between the authors and producers of the products because we do not intend to use these products as an avenue for any litigation but for the advancement of knowledge. Also, the research was not funded by the producing company rather it was funded by personal efforts of the authors.

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