ORIGINAL ARTICLE

Awareness and knowledge of human immunodeficiency virus post exposure prophylaxis among Nigerian Family Physicians

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ABSTRACT

Background: To determine the level of awareness and knowledge of HIV postexposure prophylaxis (HIV PEP) and determinants of adequate knowledge among Family Physicians in Nigeria. **Materials and Methods:** This was a cross-sectional questionnaire-based survey conducted among 175 Family Physicians at two national conferences. **Results:** Majority (97.7%) of the respondents was aware of the concept of HIV PEP and 99.4% believed it was effective in preventing HIV transmission. Over two third of our respondents had been exposed to NSI; however, less than 25% of those exposed received PEP. There was high level of knowledge of the various high-risk body fluids as well as types of high-risk exposures. 93.9% of our respondents knew that HIV PEP should commence within 1 h of exposure, 83.3% knew the correct duration of HIV PEP, but only 57.0% knew the ideal PEP regimen for high-risk exposures. The total mean score for our respondents was 17.8±2.9 with 79.4% having an adequate score. Being a junior doctor and male sex were associated with adequate knowledge. **Conclusion:** This study shows that despite high levels of awareness and knowledge of HIV PEP, access to its use among family physicians in Nigeria is still sub-optimal.

Key words: Family physicians, HIV PEP, Nigeria

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INTRODUCTION

Health-care workers (HCWs) are at increased risk of acquiring infections with blood borne pathogens because of occupational exposure to blood and other body fluids. The human immunodefienciency virus (HIV), being one such pathogen is an important occupational risk for HCWs. The incidence of all injuries with potential to transmit these infections varies between occupational groups but is more prevalent in those providing primary care and performing invasive procedures.[1,2]

Factors that determine risk of significant exposure to HIV include frequency of needle stick injuries (NSI) and the prevalence of HIV in the patient population, amongst others. The estimated yearly risk of HIV infection for anaesthetists in the United States, for example has been put at between 0.00013–0.032% depending on the sero-prevalence of HIV within the patient population.[3] Guidelines on the management of occupational exposure to HIV exist. Despite these clear guidelines, HCWs, especially those providing primary care generally take inadequate measures following occupational exposure to HIV.[4,5]

The first case of documented seroconversion after a specific occupational exposure to HIV was reported in 1984 and an approximate number of 1000 cases occur each year due to accidental exposure.[6,7] Nigeria ranks among the top three countries with the highest burden of HIV/AIDS (UNAIDS) and as such family physicians (FPs) who are involved in the provision of care at all levels of the health system are constantly at risk of acquiring HIV and other blood borne pathogens. The aim of this study therefore was to assess the awareness and knowledge of FPs in Nigeria regarding HIV post exposure prophylaxis.

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MATERIALS AND METHODS

The Society of Family Physicians of Nigeria (SOFPON) holds her scientific meetings annually. At the 13th Annual National Conference of the society, as well as at a training

workshop organized by the National Postgraduate Medical College for FPs in training, questionnaires were distributed to doctors to assess their level of awareness and knowledge regarding the use of postexposure prophylaxis to prevent the transmission of HIV.

This was a cross-sectional questionnaire-based survey with nationwide representation of FPs in Nigeria. The study tool was made up of 23 items. To assess awareness, respondents were asked if they had ever heard of HIV PEP. Knowledge was assessed by asking if the respondents knew whether HIV PEP was effective in reducing/preventing HIV transmission; which body fluids were considered to have high-risk for HIV transmission; the initial first-aid measures to employ in the event of accidental exposure; the best timing for commencement of HIV PEP following exposure and the ideal antiretroviral (ARV) drug regimen for HIV PEP. Respondents were also asked if HIV PEP should be offered for nonoccupational exposure. We also obtained history of personal needle stick injuries.

Respondents were scored based on the number of correct responses to the 23 items listed on the questionnaire to assess knowledge of HIV PEP; with all questions equally weighted. For the purpose of this study, adequate knowledge was defined as correctly answering at least ≥70% of the 23 listed items. Data was entered and analyzed using Epi Info statistical package version 3.3.5 (CDC, Atlanta, Georgia). Results are presented as frequencies and means with SD where appropriate. Differences between those with adequate knowledge and those with inadequate knowledge were analyzed using chi-squared test. To determine independent predictors of adequate knowledge, we used multivariate logistic regression. *P* values ≤0.05 were considered statistically significant. The Human Research Ethics Committee (HREC) of the Jos University Teaching Hospital approved the study.

RESULTS

A total of 300 questionnaires were administered and 186 were returned. Only 175 had adequate information and were included in the analysis. The characteristics and risk profile of responding physicians are presented in Table 1. There were 43 (24.6%) female respondents with a mean age 38 ± 7 years but ranged from 27–64 years. Ninety-seven (55.4%) of the respondents were junior residents, 32 (18.3%) were senior residents while 46 (26.3%) were consultants. The majority (82.8%) of the respondents worked in government facilities and 156 (90.2%) had donor funded HIV/AIDS treatment programs in their hospitals. One hundred and seventy-one (97.7%) of the respondents were aware of the concept of HIV postexposure prophylaxis. One hundred and forty two (82.1%) had existing protocols for HIV PEP at their workplaces, 13 (7.5%) did not have HIV PEP protocols at their workplaces, and 18 (10.4%) were not aware of the existence of HIV PEP protocols in their facilities. One hundred and twenty (69.8%) were in medical specialties at the time of the survey. When asked if they considered themselves at risk of acquiring HIV from the workplace, 158 (91.3%) indicated that they were at risk of acquiring HIV from the workplace while 15 (8.7%) indicated otherwise. With regards to the frequency of contact with body fluids, 94 (54.7%) respondents had daily contact with body fluids, 30 (17.4%) had weekly contact while 48 (27.9%)

Table 1: Characteristics and risk profile of 175 family physicians in Nigeria surveyed on their knowledge and awareness of HIV postexposure prophylaxis

Characteristic	*n* (%)
Sex	
Female	43 (24.6)
Male	132 (75.4)
Mean age (years)	38 ± 7
Rank	
Registrar/SHO	97 (55.4)
Senior registrar	32 (18.3)
Consultant	46 (26.3)
Work setting	
Government	145 (82.8)
Faith based	17 (9.8)
Private for profit	11 (6.3)
NGO	2 (1.1)
Facility operates funded HIV treatment program, *n*=173	
Yes	156 (90.2)
No	17 (9.8)
Does your hospital/clinic have a protocol for HIV-PEP, *n*=173	
Yes	142 (82.1)
No	13 (7.5)
Don't know	18 (10.4)
Which specialty are you currently in, *n*=172	
Medical†	120 (69.8)
Surgical§	52 (30.2)
Do you consider yourself to be at risk for HIV acquisition at your workplace, *n*=173	
Yes	158 (91.3)
No	15 (8.7)
How frequently do you handle body fluids/tissues, *n*=172	
Daily	94 (54.7)
Weekly	30 (17.4)
Infrequently	48 (27.9)
Ever had needle stick injury, *n*=173	
Yes	120 (69.4)
No	53 (30.6)
Frequency of needle stick injuries experienced, *n*=120	
Once	40 (33.3)
2-5 times	64 (53.4)
≥5 times	16 (13.3)
Ever received HIV-PEP for needle stick injury, *n*=120	
Yes	26 (21.6)
No	94 (78.4)
Mean total score	17.8 ± 2.9
Proportion with adequate score (≥16), *n*=175	
Yes	139 (79.4)
No	36 (20.6)

†Internal medicine/Paediatrics, §Surgery/Obstetrics and Gynaecology

handled body fluids infrequently. One hundred and twenty (69.4%) of the respondents reported history of needle stick injuries and majority (66.7%) of those reporting needle stick injuries (NSI) had had multiple injuries. Only 26 (21.6%) of the 120 respondents that had history of NSI had received antiretroviral prophylaxis following such NSI.

Awareness and knowledge of HIV PEP

The level of awareness and knowledge of HIV PEP is presented in Table 2. One hundred and seventy one (97.7%) respondents were aware of the existence of the concept of HIV PEP and an equal number of respondents (171) were aware that HIV PEP was effective in reducing the transmission of HIV. Seventy-four (51.4%) respondents correctly identified the risk of transmission of HIV from a NSI to be around three per 1000 injuries. Sixty-three (43.8%) over estimated the risk while 7 (4.9%) underestimated the risk of HIV transmission from needle stick injuries. Regarding knowledge of various high risk body fluids for HIV transmission, the following proportions were obtained for correct identification of the following body fluids as high risk for HIV transmission: breast milk 88.6%, peritoneal fluid 85.7%, synovial fluid 77.0%, pleural fluid 87.0%, and cerebrospinal fluid 85.8%. However, 12.7%, 17.7%, and 11.5% incorrectly identified urine, saliva and feces respectively as high-risk fluids for HIV transmission.

One hundred and thirteen (70.2%) and 166 (97.1%) correctly stated both measures as two first aid procedures to perform at the needle stick site. Fifty-five (34.4%) respondents erroneously thought that applying hypochlorite to the wound was an appropriate first aid measure at the needle stick site. With regards to types of exposures with high risk for HIV transmission, all (100%) the respondents knew that exposure of broken skin to body fluids was high risk for HIV transmission. One hundred and thirty eight (81.7%) and 137 (83.5%) identified mucous membrane exposure and percutaneous injuries were high-risk exposures for HIV transmission respectively. One hundred and fifty-four (93.9%) of the respondents knew that HIV PEP should be commenced within one hour of a high-risk needle stick injury, while 10 (6.1%) thought PEP could still be effectively used after 72 h following a needle stick injury. In response to what the ideal drug regimen is for high-risk exposure, 94 (57%) respondents identified an expanded 3-drug regimen as ideal while 54 (32.7%) and 17 (10.3%) incorrectly stated 2-drug and one-drug regimens, respectively.

One hundred and forty (83.3%) respondents said HIV PEP should be used for 4 weeks, while 26 (15.5%) respondents over estimated the duration of use and two (1.2%) underestimated the duration of use of HIV PEP. Of 167 physicians responding to the question of the administration of HIV PEP for nonoccupational exposures, 102 (61.1%) indicated that it was appropriate to use HIV PEP for nonoccupational exposure while 65 (38.9%) did not support the use of HIV PEP for nonoccupational exposures.

Table 2: Results of the responses of 175 family physicians in Nigeria surveyed on their knowledge and awareness of HIV postexposure prophylaxis

Question	Yes	No
Ever heard of HIV-PEP, *n*=175	171 (97.7)	4 (2.3)
Is HIV-PEP effective in preventing HIV transmission, *n*=172	171 (99.4)	1 (0.6)
What proportion of needle stick injuries result in HIV transmission?, *n*=144		
1/100	41 (28.5)	NA
1/500	22 (15.3)	NA
3/1000	74 (51.4)	NA
10/1000	7 (4.9)	NA
The following are fluids that can transmit HIV (high-risk fluids)		
Breast milk, *n*=167	148 (88.6)	19 (11.4)
Urine, *n*=158	20 (12.7)	138 (87.3)
Peritoneal fluid, *n*=161	138 (85.7)	23 (14.3)
Synovial fluid, *n*=152	117 (77.0)	35 (23.0)
Pleural fluid, *n*=162	141 (87.0)	21 (13.0)
Saliva, *n*=164	29 (17.7)	135 (82.3)
Feaces, *n*=157	18 (11.5)	139 (88.5)
Cerebrospinal fluid, *n*=162	139 (85.8)	23 (14.2)
Initial first-aid measures to institute following needle stick injury		
Promote active bleeding of wound, *n*=161	113 (70.2)	48 (29.8)
Wash thoroughly with soap and water, *n*=171	166 (97.1)	5 (2.9)
The following are high risk exposures for HIV transmission		
Percutaneous injuries, *n*=164	137 (83.5)	27 (16.5)
Exposure of intact skin to body fluids, *n*=164	14 (8.5)	150 (91.5)
Mucous membrane exposure, *n*=169	138 (81.7)	31 (18.3)
Exposure of broken skin, *n*=175	100 (175)	0 (0)
How soon after needle stick injury should PEP be commenced, *n*=164		
Within 1 hour	154 (93.9)	
After 72 hours	10 (6.1)	
The ideal HIV-PEP regimen following high-risk needle stick injury, *n*=165		
One drug regimen	17 (10.3)	
2-drug regimen	54 (32.7)	
Expanded drug regimen	94 (57.0)	
What is the duration of HIV-PEP, *n*=168		
1 week	1 (0.6)	
2 weeks	1 (0.6)	
4 weeks	140 (83.3)	
3 months	26 (15.5)	
Should HIV-PEP be administered for accidental non-occupational exposure to HIV, *n*=167	102 (61.1%)	65 (38.9%)

Factors associated with adequate knowledge of HIV PEP

For the purpose of this study, adequate knowledge was defined as correctly answering 16 (≥70%) of the 23

listed items. One hundred and thirty-nine (79.4%) of the 175 physicians surveyed had adequate knowledge while 36 (20.6%) had inadequate knowledge. We compared respondents with adequate and inadequate knowledge by sex, work setting (government or other), receipt of donor funds for HIV treatment and rank (junior-senior house officers/registrar versus senior-senior registrar/consultant doctor) as shown in Table 3. Junior doctors had more adequate knowledge compared to senior doctors regarding HIV PEP (P=0.005). Being male was also associated with adequate knowledge (P=0.05). However, no single factor was independently predictive of adequate knowledge on multivariate analysis.

DISCUSSION

HIV/AIDS continues to be a serious public health concern and occupational exposure of HCWs to this virus poses a threat to health care delivery systems in resource-limited settings. Ensuring occupational health and workplace safety pose serious challenges in our clinical care settings; therefore, studies relating to awareness, knowledge, and attitude/practices of HCWs are vital as they help to inform policy on occupational postexposure prophylaxis against blood borne pathogens such as the HIV.

This study showed that the greater majority (97.7%) of family physicians in Nigeria are aware of the concept of HIV PEP and its effectiveness in reducing HIV transmission. Those with existing HIV PEP policies in their facilities accounted for 82.1% of the respondents. While only about half (51.4%) of the respondents correctly identified the risk of HIV transmission from NSI, there was a high level of knowledge of high-risk body fluids and types of exposures to HIV infection. We demonstrated good knowledge of first aid measures to be instituted at exposure sites and also good knowledge of the best time to commence HIV PEP, as well as the ideal ARV regimen to use in the event of a high-risk exposure to HIV. However, when the level of knowledge was compared between senior and junior doctors, junior doctors were more knowledgeable about HIV PEP than senior doctors.

Our respondents are similar in gender and age distribution when compared to previous reports from Nigeria[8,9] as well as in other middle and low-income countries,[10-12] but differed significantly in terms of awareness and knowledge of high-risk fluids for HIV transmission. The levels of awareness of HIV PEP and its effectiveness in reducing HIV transmission were 97.7% and 99.4%, respectively, for our respondents. Among HCWs in a hospital in Uganda,[11] 95% of the respondents had heard about HIV PEP but only 61% believed it was able to reduce the risk of HIV transmission. Similarly, in a study of HCW from Ethiopia,[10] 100% of the doctors surveyed believed that HIV PEP could reduce the risk of HIV transmission but only 50% had adequate knowledge of HIV PEP. In a survey of anaesthetists in Nigeria,[13] 92.1% of the respondents were aware of the concept of HIV PEP, however, only 39.7% had existing HIV PEP policies in their institutions. A recent survey among HCW in central Nigeria[9] reported that 99% of the doctors had ever heard of HIV PEP but only 56.5% were aware of the existence of written policies in their institutions. In a survey among junior doctors in the United Kingdom, 93% of those surveyed had heard of PEP for HIV; however, only76% were aware that HIV PEP reduced the transmission of HIV.[18] An earlier study among general practitioners in Australia reported a lower level of awareness of HIV PEP of 68.5% compared to our respondents.[14] The high levels of awareness of HIV PEP obtained in our cohort may be attributable to the fact that, there has been increased government and donor funds through the PEPFAR and Global Funds to fight AIDS and Malaria to implement training of HCW and increase

Table 3: Results of comparison of 175 family physicians in Nigeria with and without adequate knowledge regarding HIV postexposure prophylaxis

Variable	Adequate knowledge *n*=139	Inadequate knowledge *n*=36	*P*-value	AOR[§]	95% CI[†]
Sex (%)					
Male	74.8	77.8	0.05	0.81	0.32-2.03
Female	25.2	22.2			
Mean age (years)[‡]	37 + 7	40 + 8	0.07	0.80	0.33-1.90
Work setting (%)					
Government	84.2	77.1	0.20	1.91	0.73-5.00
Others	15.8	22.9			
Facility funded for HIV treatment (%)					
Yes	90.5	88.9	0.77	1.03	0.29-3.65
No	9.5	11.1			
Rank (%)					
Junior doctor*	55.4	55.6	0.005	0.74	0.30-1.82
Senior doctor **	44.6	44.4			

*Registrar/senior house officer; **Senior registrar/Consultant; [§]Adjusted odds ratio [†]95% Confidence interval; [‡]Age was categorized as > 40 vs ≤40 years for multivariate analysis

access to HIV treatment programs in health care settings in Nigeria.

The risk of a NSI from a patient with HIV resulting in seroconversion is estimated to be around 0.3%.[15] Overall, 51.4% of our respondents correctly estimated the risk of seroconversion from NSI. Less than half (43.8%) over estimated the risk and 4.9% underestimated the risk. This low level of risk estimation among FPs in Nigeria is similar to that reported from other medical specialties.[13] Similarly, among British anaesthetists, only 34% were aware of the true risk of HIV transmission from NSI.[16] The need for adequate knowledge of NSI risk of HIV transmission cannot be overemphasized among HCW especially primary care physician's as this is essential in the risk assessment process of HIV PEP administration.

The level of knowledge on the correct identification of both high and low-risk body fluids for HIV transmission was high for our respondents. Similar rates have been reported among HCW and surgery resident doctors in Nigeria[9,17] but much lower rates of knowledge of high and low risk body fluids were found among Nigerian and UK anaeasthetists.[16,17] Even though universal precaution is advocated for every patient, correct knowledge of high-risk body fluids for HIV transmission is essential so that extra precaution may be taken to further minimize the risk of HIV transmission.

Following a NSI, the first priority should be to promote active bleeding of the wound and to wash thoroughly with soap and running water. The majority of (>90%) of our respondents knew the first-aid measures to be instituted at NSI site and 93.9% knew that PEP following an HIV prone NSI should be commenced within one hour. Other studies reported much lower rates of knowledge (between 15–38.5%) about the optimal timing for PEP in the event of a NSI.[12,13,18,19]

When our respondents were assessed for adequacy of knowledge of HIV PEP, 79.4% had adequate knowledge. The proportion of our respondents with adequate knowledge is higher than the 41.0% reported among surgery residents in the Eastern part of Nigeria[17] and the 50% obtained among doctors in Ethiopia.[10] Among Nigerian dentists, 64.4% were reported to have good knowledge.[8] A survey that compared doctors based on adequate versus inadequate knowledge found younger age (<40 versus >40 years), male gender and type of practice setting (teaching hospital versus other settings) and shorter length of practice (<10 versus >10 years) to be significantly associated with adequate knowledge.[10] Younger or junior doctors are more likely to be undergoing postgraduate training and this may explain why they had more adequate knowledge of HIV PEP as HIV medicine is incorporated into their training curricula. The reason why male gender was associated with better knowledge may be due to the unequal distribution of respondents in our study and other studies because majority of our respondents were male.

Our study reports high level of awareness, knowledge of HIV risk transmission from NSI and adequate knowledge of HIV PEP among FPs in Nigeria. These overall findings may be attributed to the fact that Nigerian HCWs have received increased training activities in HIV medicine because of increased government funding and commitment to fight HIV/AIDS. Also, donor driven initiatives like the US governments Presidents Emergency plan for AIDS Relief (PEPFAR) and the Global Fund to Fight AIDS, TB and Malaria (GFTAM) have contributed to capacity building in HIV/AIDS management especially in the health sector. Despite the level of awareness and knowledge demonstrated by the family physicians in our study, majority of those that had been exposed to NSI did not access HIV PEP, even though most of their institutions had existing HIV PEP policies and protocols. This knowledge–practice gap provides opportunities for targeted interventions to improve HCWs access to existing policies and protocols for effective utilization of HIV PEP which is needed to prevent seroconversions from NSI and other modes of occupational exposure, especially since recent reports from Nigeria indicate that this knowledge–practice gap is generalized among those at risk.[9,20,21] Special programs to improve knowledge and increase access to HIV PEP targeting senior doctors should also be encouraged and instituted. Our study was cross-sectional in nature but the results are generalizable because it was a nationwide survey that included FPs from all over the country.

CONCLUSION

In conclusion, our study has revealed that despite the high levels of awareness and knowledge of HIV PEP among Nigerian family physicians, there exists a knowledge–practice gap necessitating the need for enhanced prevention education to improve or close this gap.

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