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Knowledge, Attitude and Practice of HIV Post-exposure Prophylaxis (PEP) among Primary Health Care Workers in Aba South Local Government Area, Abia State, Nigeria.

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Abstract

Health-care workers are predisposed to post-exposure transmission of the Human Immunodeficiency Virus (HIV) infection. Remarkable knowledge, attitude and practice of post-exposure prophylaxis (PEP) are needful in mitigating the occupation-related transmission of HIV among health-care practitioners. Consequently, the Knowledge, Attitude and Practice of HIV Post Exposure Prophylaxis (PEP) among Healthcare Workers in Aba South Local Government Area, Abia State, Nigeria were investigated. Two hundred and two (202) health workers; including nurses, doctors, laboratory scientists and community health workers were sampled in a cross sectional survey study. Structured questionnaires were tested for internal consistency using the Cronbach's Alpha, authenticated for face and content validity by institutional Body of Validators and administered on the respondents. Data were analysed, using the Statistical Package for Social Sciences (SPSS) Version 20 Software, with both descriptive and inferential statistics of Chi-square (X^2) and One-way Analysis of Variance (ANOVA). 86.6% of respondents had knowledge of HIV PEP, 95.5% and 4.5% had positive and negative attitudes to PEP respectively, 83.2% had poor practice, while 16.8% had good practice. Knowledge of HIV PEP did not co-relate significantly ($P>0.05$) with PEP practice, but co-related significantly ($p<0.05$) with attitude towards HIV PEP. Knowledge of HIV PEP across workers differed significantly ($P<0.05$), attitudes towards HIV PEP across professions did not differ significantly ($P>0.05$), while practice of HIV PEP across workers differed significantly ($P < 0.05$). Strategic health education and advocacy on HIV post-exposure prophylaxis among health-care practitioners should be intensified to enhance timely post-exposure prophylactic interventions.

Keywords: Knowledge; Attitude; Practice; Post-exposure; Prophylaxis; HIV

Introduction

The Human Immunodeficiency Virus (HIV) is an RNA retrovirus which produces the enzyme Reverse Transcriptase inside the cells of the infected person (host cells). This enzyme transforms viral RNA to cells in the gastrointestinal tract and neurological cells in the brain, mainly the CD4 helper T-cells. HIV establishes itself within the body's CD4 cell populations and gradually destroys them, while at the same time being protected from other body defense mechanisms. Since CD4 cells are central to the body's immune system, both antibody-mediated and cell-mediated immunity are progressively eroded with the consequent development of widespread opportunistic infections, often by microbes of relatively low pathogenicity. HIV has been isolated from semen, cervical secretions, lymphocytes, plasma, cerebrospinal fluid, tears, saliva, urine, and breast milk. The secretions known to be especially infectious are semen, cervical secretions, blood and blood products. HIV infection is spread through sexual intercourse (vaginal and anal), contaminated needles used during treatment of HIV patients, use of same needle by drug addicts, placental transmission from mother to fetus (vertical transmission), blood contamination during childbirth and breast milk (Waugh & Grant, 2014).

HIV is a serious public health problem with remarkable mortality, even among health care workers such as nurses, doctors and laboratory scientists. It is probably the most serious cause of anxiety among health care workers (HCWs) in many countries, including Nigeria. On daily basis, thousands of health-care workers around the world suffer accidental occupational exposure to blood borne pathogens (Lin & Wuz, 2010).

Accidental occupational exposures to blood borne infections, including HIV, are predominant among health-care personnel and it has been reported that nearly 1 million health-care workers suffer needle stick injuries each year (Taegtmeyer & Suckling, 2011), as a result, hundreds of health-care workers are infected with diseases such as hepatitis B, and C, HIV and other blood borne diseases. The risk of occupational transmission of HIV varies with the type and severity of exposure. In prospective studies of health-care providers, including nurses, doctors and laboratory scientist, the average risk of HIV transmission following a percutaneous exposure to

HIV infected blood was estimated to be approximately 0.3% and approximately 0.09% after mucosal membrane exposure (Smith & Leggat, 2014). According to the World Health Organization (WHO, 2010), there are approximately 3 million percutaneous exposures among health-care providers (HCPs) worldwide and these exposures are estimated to result in 200-500 HIV infections. To curb morbidities associated with accidental exposures to HIV, the Centre for Disease Control (CDC) (2001) recommended the prophylactic treatment of workers who are potentially exposed to infected patients.

HIV post-exposure prophylaxis (PEP) is a short term antiretroviral treatment given to reduce the likelihood of HIV infection after potential exposure, either occupationally or non-occupationally (WHO, 2013). Post-exposure prophylaxis is indicated in needle stick injuries or injuries with sharp objects that have been used on HIV positive patients, broken skins exposed to potentially infectious secretions, rape victims and babies born to HIV positive mothers. Post-exposure prophylactic treatments should be commenced 1-6 hours post-exposure among individuals potentially exposed to HIV transmission, however, treatments initiated 24-72 hours post-exposure have proved to yield limited prophylactic benefits, while prompt post-exposure prophylaxis (PEP) reduces the risk of HIV infection by over 80%. It has been recommended that the duration of prophylactic treatment should be 28 days (4 weeks) with simultaneous laboratory investigations to rule out possible adverse drug reactions, for instance, bone marrow suppression by zidovudine (Centre for Disease Control, 2013). The efficacy of post-exposure prophylaxis is related to the specific PEP regimen and the exposed health care worker's adherence to the post-exposure prophylaxis regimen.

The level of knowledge of occupational HIV post-exposure prophylaxis among health care workers is inadequate (Hossini *et al*., 2013), therefore, it is important that health-care workers who are at potential risk of exposure to HIV/ AIDS are properly educated on the need for timely post-exposure prophylactic interventions, however, prevention of exposure remains the most effective measure to curtail the risk of HIV transmission among health workers. The use of universal precautionary guidelines in work places has been shown to diminish the incidence of occupational exposure to

blood borne infections like HIV, hepatitis B and C (Sadob & Fawole, 2012), but despite these precautions, occupational exposures still occur and are apparently under-reported in some institutions (Cardo & Culver, 2010).

Kane and Lioyd (2009) revealed that many doctors, nurses, and laboratory scientists do not practice post-exposure prophylaxis (PEP) following exposure and this is likely to add to the burden of HIV infection in the society. The awareness of post-exposure prophylaxis for HIV infections among health-care workers has been remarkably studied, but there is paucity of documented literature on post-exposure prophylactic practices (Twitchell, 2013). Based on this, the study therefore investigated the Knowledge, Attitude and Practice of HIV Post-exposure Prophylaxis among Primary Health Care Workers in Aba South Local Government Area, Abia State, Nigeria.

Methodology

The study was conducted in Aba South Local Government Area, Abia State, Nigeria which occupies a land mass of about 49km^2 with a population of approximately 423,852 people (2006 Census). The population is predominantly made up of the Igbos while other tribes of the country constitute the minority. The native language of the people is Igbo and their main occupations are trading and farming.

Ethical consents and approvals were obtained from the study participants and Abia State Ministry of Health respectively. Structured questionnaires were developed by the investigator and authenticated for face and content validity by a Body of Validators in the Department of Nursing Sciences, University of Nigeria, Enugu, Nigeria and Department of Statistics, Enugu State University of Science and Technology, Enugu, Nigeria. The consistencies of the instruments were measured with the Cronbach's Alpha after a test-retest pilot study and reliability coefficients of 0.87 and 0.85 were recorded for sections A and B of the questionnaires respectively. Therefore, the internal consistencies of the questionnaires were considered reliable.

Two hundred and two (202), out of 204 questionnaires were retrieved from the respondents, representing a response rate of 99%. Data were collated and analysed,

using the Statistical Package for Social Sciences (SPSS) Version 20 Software, with descriptive and inferential statistics of Chi-square (X^2) and One-way Analysis of Variance (ANOVA). $p<0.05$ was considered significant. The criterion mean of 2.5 was adopted for the attitude scale; responses with mean scores higher than 2.5 represented positive attitudes, while those with mean scores of 2.5 and lower were negative.

Results

Table 1: Demographic distribution of the respondents

One hundred and eleven (111) (55.0%) of the respondents were females, while 91 (45.0%) were males. 36-40years age group had the highest number of respondents (63) (31.2%), whereas only 15 (7.4%) were in the age group of 46-50years. Most of the respondents 130 (64.4%) were married, while 66 (32.7%) were single, 3(1.5%) each were divorced and widowed. The educational status showed that (136) (67.3%) had Bachelor degree, 56 (27.7%) had Diploma, 4 (2.0%) and 6 (3.0%) had higher school or less and Master's degree/ MD & above respectively. The professional cadres of the respondents showed that 133 (65.8%) were nurses, 35 (17.3%) community health workers, 27 (13.4%) laboratory scientists, while 7 (3.5%) were doctors. Their departments showed that 92 (45.5%) were in Operating Theatre and Special Clinics, 85 (42.1%) in Maternal service, while 25 (12.4%) were in Outpatient department. On work experience, 104 (51.5%) had worked for 1-5years, while 63 (31.2%) had worked for more than 10years.

Demographic Characteristics	No of Respondents	Percentage
Gender		
Female	111	55.0%
Male	91	45.0%
Age Group in years		
26 – 30years	48	23.8%
31 – 35years	52	25.7%
36 – 40years	63	31.2%
41 – 45years	24	11.9%
46 – 50years	15	7.4
Mean age (SD)	36.8(5.8)years	
Marital status		
Married	130	64.4%
Single	66	32.7%
Divorced	3	1.5%
Widowed	3	1.5%
Educational status		
Higher school or less	4	2.0%
Diploma	56	27.7%
Bachelor degree	136	67.3%
Master degree/ MD and above	6	3.0%
Professional cadre		
Nurses	133	65.8%
Community Health Workers	35	17.3%
Laboratory Scientists	27	13.4%
Doctors	7	3.5%
Department		
Operating Theatre and Special Clinic	92	45.5%
Maternal Services	85	42.1%
Outpatient department	25	12.4%
Work experience		
Less than 1year	8	4.0%
1-5years	104	51.5%
6-10years	27	13.4%
10years & above	63	31.2%

Table 2: Level of knowledge of HIV post exposure prophylaxis among primary healthcare workers

All respondents (100%) have heard of HIV post exposure prophylaxis; and majority of them 179 (88.6%) knew that it is the treatment given when one has been potentially exposed to HIV. One hundred and seven (107) (53.0%) had participated in trainings related to PEP, while 121 (59.9%) said their hospitals/ clinics have facilities for PEP. Thirty five (35) (17.3%) respondents knew that PEP should be initiated within 1hour – 72hours after exposure to HIV, while 39 (19.3%) knew that the duration of HIV PEP is 4weeks. About 71 (35.1%) knew that HIV PEP should not be administered for accidental non-occupational exposure to HIV. On the drugs that can be used as PEP when multiple responses were allowed, only 2 (1.0%) of the respondents knew of Emtricitabine, Truvada and Raltegravir. On the indications of HIV PEP, 75 (37.1%) knew about occupational exposures to blood and/ other body fluids that might contain HIV. On the level of knowledge of HIV PEP, questions 9, 12, 13, 14, 15, and 16 which are What do you understand by post exposure prophylaxis?, How soon after exposure to HIV should PEP be initiated?, What is the duration of HIV PEP?, Should HIV PEP be administered for accidental non-occupational exposure to HIV?, Which of these drugs can be used as PEP?, and What are the indications of HIV PEP? with corresponding answers, treatment given when one has been potentially exposed to HIV, 1hour – 72hours, 4weeks, No, Emtricitabine, Truvada, Raltegravir, and Occupational exposure to blood and/ other body fluids that might contain HIV respectively were marked and scored.

Level of Knowledge of HIV Post Exposure Prophylaxis	Frequency	Percentage
Have you ever heard about post exposure prophylaxis?		
Yes	202	100%
What do you understand by post exposure prophylaxis?		
Treatment given when one has been potentially exposed to HIV	179	86.6%
Treatment given to patient with skin infection	9	4.5%
Treatment given to patient with hypertension	6	3.0%
Treatment given to somebody with fever	4	2.0%
Treatment given to patient with malnutrition	4	2.0%
Have you participated in any training related to PEP?		
Yes	107	53.0%
No	95	47.0%
Do your hospital/ clinic have facility for PEP?		
Yes	121	59.9%
No	81	40.1%
How soon after exposure to HIV should PEP be initiated?		
1hour – 72hours	35	17.3%
48hours – 72hours	147	72.8%
After 72hours	20	9.9%
What is the duration of HIV PEP?		
1 – 2weeks	6	3.0%
3weeks	70	34.7%
4weeks	39	19.3%
5 – 24weeks	28	13.9%
Don't know	59	29.2%
Should HIV PEP be administered for accidental non-occupational exposure to HIV?		
Yes	131	64.9%
No	71	35.1%
Which of these drugs can be used as PEP?		
Ranitidine	72	35.6%
Zidovudine	43	21.3%
Emtricilabine	35	17.3%
Tenofovir	24	11.9%
Lamivudine	11	5.4%
Emtricitabine, Truvada, Raltegravir	2	1.0%
Ciprofloxacin	2	1.0%
Ampiclox	1	0.5%
What are the indications of HIV PEP?		
Non-occupational exposure to HIV	127	62.9%
Occupational exposure to blood and/ other body fluids that might contain HIV	75	37.1%

Table 3: The attitude of primary healthcare workers towards HIV post exposure prophylaxis

All the items were accepted (mean scores > cut-off point of 2.50). This shows that primary healthcare workers have positive attitude towards HIV post exposure prophylaxis.

S/N	ITEMS	SA	A	D	SD	Sum	Mean	Std	Decision
17.	PEP can reduce the probability of being infected after exposure.	108	35	12	47	608	3.01*	1.24	Accepted
18.	PEP can be effective in preventing HIV transmission.	26	116	60	0	572	2.83*	0.63	Accepted
19.	I will like to take PEP if I am exposed to the risk of HIV.	86	98	12	6	668	3.31*	0.72	Accepted
20.	It is good to complete HIV PEP.	71	115	13	3	658	3.26*	0.61	Accepted
21.	PEP can be initiated at any time after exposure.	59	90	37	16	596	2.95*	0.89	Accepted
22.	It is important that the duration of PEP is completed.	38	103	58	3	580	2.87*	0.72	Accepted
23.	It is not compulsory to complete the course of treatment on PEP once started.	64	85	30	23	594	2.94*	0.96	Accepted
24.	PEP should only be used when there is occupational exposure.	77	101	23	1	658	3.26*	0.67	Accepted
25.	All health workers should be knowledgeable about PEP and be ready to use it when necessary.	34	103	64	1	574	2.84*	0.69	Accepted
26.	I will not like to take up PEP because of possibility of showing a positive HIV status.	40	77	63	22	539	2.67*	0.92	Accepted
	Mean of means of attitude to PEP					**605**	**2.99***	**0.30**	**Accepted**

* Cut-off point = 2.50

Table 4: The rating of attitude of primary healthcare workers towards HIV post exposure prophylaxis

A score of below 2.50 showed a negative attitude, while a score higher than 2.50 showed a positive attitude. Therefore, majority of the respondents 193 (95.5%) had positive attitudes towards HIV post exposure prophylaxis, while only 9 (4.5%) of them had negative attitude towards it.

Rating of Attitude of HIV Post Exposure Prophylaxis	Frequency	Percentage
Have you ever heard about post exposure prophylaxis?		
Negative attitude	9	4.5%
Positive attitude	193	95.5%
Total	202	100%

Table 5: The practice of HIV post exposure prophylaxis among primary healthcare workers

Most of the respondents 179 (88.6%) have had occupational exposures at their work places. Out of these 179 respondents when multiple responses were allowed, the type of the exposure was mostly splashing of blood on mucous surface 80 (44.7%). Others include contamination of broken skin or mucus membrane 44 (24.6%), exposure of open wound to body fluid 16 (8.9%), needle prick 14 (12.4%), and medical sharp injuries 10 (5.6%), Most of these respondents 86 (39.8%) encountered this kind of exposure once in a year, while 41 (22.9%) encountered it 2 – 3times in a year, and 52 (29.1%) of them encountered it 4 or more times in a year. The circumstances that warranted the exposure by these 179 respondents when multiple responses were

allowed was mostly during delivery 108 (60.3%). Most of these respondents 107 (59.8%) did not have the post exposure HIV screening of the source of exposure.

More so, only 62 (34.6%) of them received HIV PEP after exposure to HIV positive patient, while the remaining 117 (65.4%) of them did not receive HIV PEP after exposure to HIV positive patient. Out of the 62 of them that received HIV PEP after exposure to HIV positive patient, most of them 40 (64.5%) had the HIV PEP initiated within 72hours after exposure, while 16 (25.8%) of them had it initiated over 72hours after exposure, and 6 (9.7%) of them had it initiated after one week. Most of the respondents had HIV PEP that lasted for four weeks, 21 (33.9%) after initiation. However, 11 (17.7%) of them had it last for two weeks, 19 (30.6%) of them lasted for three weeks, while 11 (17.7%) of them lasted for five weeks. From among the 117 respondents who did not receive HIV PEP after exposure to HIV positive patient, the reason given by almost half of them 55 (47.0%) was administrative bottlenecks, while 41 (35.0%) of them said there was no reason. Only 11 (9.4%) of them said it was because of non-availability of PEP service in their hospitals, while 6 (5.1%) of them said it was not necessary, and 4 (3.4%) of them said they were not aware of the need to take PEP after exposure. In general, to determine the practice level of HIV PEP by the respondents, if no was the answer to question 27, which is ‘’have you had occupational exposure at your workplace’’?, then it is a good practice. Also, if screened, yes, within 72hours and four weeks were the responses to questions 31, 32, 33, and 34 which are “Post exposure HIV screening of the source of exposure”, “Did you receive HIV PEP after exposure to HIV patient?”, “How soon was the HIV PEP initiated after the exposure?”, and “What duration did your HIV PEP last?” respectively, then it was a good practice. In general, very few of the respondents 34 (16.8%) practiced HIV PEP.

Practice of HIV Post Exposure Prophylaxis	Frequency	Percentage
Have you had occupational exposure at your workplace?		
Yes	179	88.6%
No	23	11.4%
	202	100.0%
Type of exposure		
Splashing of blood on mucous surface	80	44.7%
Contamination of broken skin or mucus membrane	44	24.6%
Exposure of open wound to body fluid	16	8.9%
Needle prick	14	12.4%
Medical sharp injuries	10	5.6%
Number of exposure encountered in one year		
1	86	48.0%
2 – 3	41	22.9%
≥ 4	52	29.1%
	179	100.0%
Circumstance of exposure		
Delivery	108	60.3%
Collecting blood sample	16	8.9%
Recapping of used needle	16	8.9%
Giving injection	13	7.3%
Suturing of wound	8	4.5%
Setting IV line	7	3.9%
Surgery	6	3.4%
Post exposure HIV screening of the source of exposure		
Not screened	107	59.8%
Screened	72	40.2%
Did you receive HIV PEP after exposure to HIV patient?		
No	117	65.4%
Yes	62	34.6%
How soon was the HIV PEP initiated after the exposure?		
Within 72hours	40	64.5%
After 72hours	16	25.8%
After one week	6	9.7%
What duration did your HIV PEP last?		
Two weeks	11	17.7%
Three weeks	19	30.6%
Four weeks	21	33.9%
Five weeks	11	17.7%
Reason for not receiving PEP after exposure to HIV positive patient		
Administrative bottlenecks	55	47.0%
No reason	41	35.0%
Non availability of PEP service in the hospital	11	9.4%
Not necessary	6	5.1%
Not aware of the need to take PEP after exposure	4	3.4%
Summary of practice of HIV PEP		
Poor practice	168	83.2%
Good practice	34	16.8%
Total	**202**	**100.0%**

Discussion

The study showed that 86.6% of the respondents had good understanding of the meaning of HIV PEP, although only few were knowledgeable in the indications for PEP, initiation timeline, drug choice and duration of treatment. The result of the present study is consistent with those of Kasat *et al.* (2014) and Agaba *et al.* (2014) where majority of the respondents showed remarkable awareness and knowledge of HIV PEP. Although the occupation groups investigated by Kasel *et al.* and Agaba *et al.* were different from those of the present study, the comparability of the results could be attributed to the commonality of the occupations as healthcare providers. The high level of knowledge of PEP among the respondents is understandable considering their professional backgrounds and knowledge on health-related interventions. The result of the present study corroborates the findings of Kasat *et al*. (2014); Sendo (2014) and Alenyo *et al*. (2009) who opined that majority of health workers do not know the appropriate timeline for the initiation of PEP interventions, but disagrees with Mathewos *et al*. (2013) who postulated that 63% of health workers were knowledgeable in the initiation timeline of PEP. Ajibola *et al*. (2014) reported that less than half of the population of health workers was aware of the appropriate duration of treatment contrary to the findings of the present study. Furthermore, the present study agrees with the results of Owolabi *et al*. (2011) who reported that only 30.9% of healthcare workers were aware of the appropriate duration of treatment. The agreement between the result of the present study and that of Owolabi *et al*. may likely be as a result of the similarity of the healthcare workers sampled by both studies. The level of knowledge of HIV PEP treatment differed significantly ($p<0.05$) across the sampled professions.

Furthermore, the attitude of the respondents to PEP was reported to be positive; corroborating the reports of Ajibola *et al*. (2014) and Mathewos *et al.* (2013) who also reported positive attitudes of respondents in their studies on knowledge, attitude and practice of HIV PEP. The professions of the respondents and their understanding of the need for disease prevention underscore the predilection of their attitudes to post-exposure prophylaxis, in addition to their training in post-exposure prophylaxis and

young ages. However, attitude towards HIV PEP among primary healthcare workers did not differ significantly (P>0.05).

The practice of PEP among the sampled respondents was poor with only 34.6% receiving PEP treatments. On the contrary, Mathewos *et al*. (2013) reported that approximately 74% of the respondents who had been predisposed to HIV infection received PEP treatment. Sendo (2014) reported 59.3%, while Ajibola *et al*. (2014), Owalabi *et al*. (2011) and Uzochukwu *et al*. (2014) reported that 6%-17% of the respondents practiced PEP treatment. Cardo and Culver (2012) observed that practice of post exposure prophylaxis by health care providers was poor, and opined that there was an urgent need for policy makers in the health sector to engage programs that will rapidly scale up PEP services in health care settings, so that avoidable occupationally acquired HIV infections can be prevented among health care providers. Larsen and Laporte (2012) stated that despite the fact that PEP is known to reduce the risk of occupationally acquired HIV, only very few health workers frequently practiced it when exposed; this may be attributed to unavailability of PEP drugs, accessibility to post exposure prophylaxis drugs, experience by health workers and some other factors like stigmatization. The present study recorded a poor level of practice of PEP among the respondents; hence, agrees with Mathewos *et al*. (2013) who reported that there was gap in knowledge, as well as practice of HIV PEP among healthcare workers (HCWs). Mathewos *et al.* therefore recommended a formal training for all HCWs regarding PEP to improve their knowledge and also a 24- hour accessible formal PEP Centre to improve their practices of PEP. Laboratory scientists recorded significantly higher ($p<0.05$) HIV PEP practice-compliance than other occupation groups probably because they were more predisposed to HIV transmission than other health workers. The practice of HIV PEP among primary healthcare workers differed significantly (P<0.05).

In the present study, 64.5% of the respondents initiated PEP within 72 hours after exposure contrary to the findings of Mathewos *et al*. (2013) who opined that less than half of the exposed respondents started taking PEP at the appropriate initiation time. The Centre for Disease Control (CDC, 2001) recommended that, post exposure prophylaxis for HIV negative persons who have recently been exposed to HIV for any

reason, should commence within 1-72 hours for optimal effect. Although the level of practice of PEP in the present study was not satisfactory, most of the respondents in the present study practiced PEP treatment within the time recommended by the Centre for Disease Control (CDC).

On the overall, the level of knowledge did not co-relate significantly ($p>0.05$) with the practice of HIV PEP, but co-related significantly and inversely ($p<0.05$) with attitude towards HIV PEP. In addition, the findings of the present study revealed that very few practiced HIV PEP irrespective of the remarkable levels of knowledge and attitude. The incongruous association between knowledge and practice suggests that the respondents may not have been committed to the knowledge acquired during trainings.

Conclusion

Health education, promotion and advocacy on HIV PEP practice should be prioritized among healthcare workers to mitigate occupation-related transmission of HIV infections.

Declaration of conflict of interest

The authors declare that there is no conflict of interest.

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