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Post-exposure prophylaxis for HIV: A 10-year review of data from a tertiary health facility in northcentral Nigeria

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Abstract:

Background: Post-exposure prophylaxis (PEP) for human immunodeficiency virus (HIV) is the use of short-term antiretroviral therapy (ART) following a single risk exposure to a potential source of HIV infection. If commenced within 72 hours following exposure, PEP has been reported to be very effective in preventing replication and spread of the virus and therefore prevent acquisition of infection. PEP is recommended for exposures occurring in both occupational and non-occupational settings. The objectives of this study are to review the profile of patients and determine the reasons for accessing PEP services in our facility with a view to recommending evidence-based solutions and ultimately contributing to achieving zero transmission of HIV.
Methodology: A retrospective review of records of patients who received PEP for HIV in our facility over a 10-year period was carried out. Demographic and clinical variables of interest were extracted from the medical records and the PEP register of 252 eligible patients. Data were presented as frequencies, means, percentages and range. Bivariate analysis to determine association of clinical and demographic variables was carried out using the Statistical Package for the Social Sciences (SPSS) with $p<0.05$ considered as statistical significance.
Results: The mean age of the 252 patients studied was 26.25±11.81 years, and females accounted for 52.7%. The commonest reason for seeking HIV PEP was occupational exposure from sharps or needle sticks or splashes in 43.3% (109/252), while rape/sexual assault was the most common non-occupational reason for PEP in 29.0% (73/252) cases. Most (72.6% and 95.2%) of the patients presented within 24 hours and 72 hours respectively following exposure. While females accounted for 98.6% of cases of rape and sexual assault, children aged 10 years and below made up 28.8%.
Conclusion: Although most patients sought PEP for HIV due to occupational exposure, majority of those who came for non-occupational exposure were due to rape or sexual assault, most of which occurred in children and adolescents. There is need to institute measures aimed at reducing the menace of rape and sexual assault especially of minors in our society and for health facilities to have psychosocial support mechanisms for these patients.

Keywords: post-exposure; prophylaxis; HIV; retrospective; record

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Prophylaxie post-exposition au VIH: Examen sur 10 ans des données d'un établissement de santé tertiaire du centre-nord du Nigeria

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Résumé:

Contexte: La prophylaxie post-exposition (PPE) contre le virus de l'immunodéficience humaine (VIH) consiste en l'utilisation d'un traitement antirétroviral (TAR) à court terme après une exposition à un risque unique à une source potentielle d'infection par le VIH. Si elle est débutée dans les 72 heures suivant l'exposition, la PPE s'est avérée très efficace pour prévenir la réplication et la propagation du virus et donc empêcher l'acquisition de l'infection. La PEP est recommandée pour les expositions survenant dans des contextes professionnels et non professionnels. Les objectifs de cette étude sont d'examiner le profil des patients et de déterminer les raisons d'accéder aux services de PEP dans notre établissement en vue de recommander des solutions fondées sur des preuves et, à terme, contribuer à atteindre zéro transmission du VIH.
Méthodologie: Une revue rétrospective des dossiers de patients ayant reçu une PPE pour le VIH dans notre établissement sur une période de 10 ans a été réalisée. Les variables démographiques et cliniques d'intérêt ont été extraites des dossiers médicaux et du registre PEP de 252 patients éligibles. Les données ont été présentées sous forme de fréquences, moyennes, pourcentages et étendues. Une analyse bivariée visant à déterminer l'association de variables cliniques et démographiques a été réalisée à l'aide du progiciel statistique pour les sciences sociales (SPSS), avec $p<0,05$ considéré comme statistiquement significatif.
Résultats: L'âge moyen des 252 patients étudiés était de 26,25±11,81 ans et les femmes représentaient 52,7%. La raison la plus courante pour demander une PPE contre le VIH était l'exposition professionnelle à des objets tranchants, des piqûres d'aiguilles ou des éclaboussures dans 43,3% (109/252), tandis que le viol/l'agression sexuelle était la raison non professionnelle la plus courante pour la PPE dans 29,0% (73/252) des cas. La plupart (72,6% et 95,2%) des patients se sont présentés respectivement dans les 24 heures et 72 heures suivant l'exposition. Alors que les femmes représentaient 98,6% des cas de viol et d'agression sexuelle, les enfants âgés de 10 ans et moins en représentaient 28,8%.
Conclusion: Bien que la plupart des patients aient demandé une PPE pour le VIH en raison d'une exposition professionnelle, la majorité de ceux qui sont venus pour une exposition non professionnelle étaient dus à un viol ou à une agression sexuelle, dont la plupart se sont produits chez des enfants et des adolescents. Il est nécessaire d'instituer des mesures visant à réduire la menace de viol et d'agression sexuelle, en particulier contre les mineurs dans notre société, et de doter les établissements de santé de mécanismes de soutien psychosocial pour ces patients.

Mots clés: post-exposition; prophylaxie; VIH; rétrospective; enregistrer

Introduction:

The United Nations Program on AIDS (UNAIDS) reports that an estimated 1.5 million new infections with the human immunodeficiency virus (HIV) occurred in 2021 (1,2). Although there has been a decline in new infections, the UNAIDS had set targets to achieve a reduction of new HIV infections to 200,000 annually by 2030 (3). One of the strategies to reduce new HIV infections is the provision of postexposure prophylaxis (PEP) (3,4). Post-exposure prophylaxis (PEP) is the use of short-term antiretroviral therapy following a single risk exposure to a potential source of HIV with the aim of preventing acquisition of infection (5-8).

Post-exposure prophylaxis offers a window of opportunity to protect the exposed individual from acquiring HIV when commenced within 24 hours and not later than 72 hours following the exposure incident. Several studies have reported the efficacy of PEP when taken appropriately (6,7,9), and is recommended for exposures to sources of potential HIV infection occurring in both occupational and non-occupational settings. Occupational exposures occur mostly during provision of health care services and can result from percutaneous injury from contaminated needles or sharps or splashes of blood or other body fluids on mucosal surfaces or non-intact skin (10, 11). Studies have reported that about 65% of health care workers experience accidental sharp injuries during their career and 32% annually. This exposure places them at risk of infections with blood borne viruses, including HIV (12). Percutaneous injuries are reported to result in about 4.4% new HIV infections annually among health care workers (13)

Non-occupational exposures that require PEP include non-use or breakage of condom during sexual encounter with a partner whose HIV status is unknown or a virally unsuppressed HIV positive partner, sexual assault or rape as well as bites and other injuries outside occupational work environment (10, 11). Sexual assault and rape have been reported to occur frequently. In the United States (US), a study reported that 21.3% of women and 1.4% of men have reported a sexual assault or rape in their lifetime (14). Sexual contact remains a major contributor to the spread of HIV transmission globally (13).

Post-exposure prophylaxis for HIV requires the use of an appropriate antiretroviral drug (ARV) regimen that is determined after clinical assessment of the exposed individual and the exposure incident. A baseline assessment of the patient includes a history of the type of exposure, the HIV status of the source, and if positive, whether virally suppressed. The exposed individual's HIV test is also carried out to ascertain they are negative before commencing PEP (4,10,11,15). The ARV regimens for PEP evolved over time from sin-

gle drug in the early phase of HIV epidemic to two or three drug regimens due to the efficacy of the drugs and the development of resistance (16). PEP regimens are taken for 28 days during which the patient has to adhere to the medications and avoid other conditions that may render the PEP ineffective and thus lead to transmission of infection. These conditions include high risk behaviours that can expose them to HIV infection such as unsafe sex, sharing of needles as well as avoiding taking other medications that can lead to drug interactions with the ARVs (14,18).

When taken appropriately, PEP has been reported to prevent transmission of infection in up to 80% of exposures (6,17). Reports show that factors contributing to transmission of infection after PEP include non-adherence to medications, concomitant use of other medication that may interact with the ARVs, engaging in high-risk behaviour during PEP and follow-up period and possible exposure to a resistant strain of the virus (17). Some studies report that discussing the risks of PEP with the patient during clinical assessment and counselling helps to reduce failure of PEP (8,9). The risks aside from failure of PEP leading to transmission of infection also includes drug side effects (5-8).

While some data are now available on post-exposure prophylaxis globally, there is still a paucity of data from resource constrained settings on the practice and efficacy of PEP. This study seeks to add to the knowledge of service providers in our region with a view to improving existing practices. The aim of our study is to review the profile of patients and determine the reasons for accessing PEP services in our facility with a view to recommend ways of improving our services and therefore reduce the number of new HIV infections following accidental exposure.

Materials and method:

Study setting:

This study was carried out at the Special Treatment Clinic (STC) of Dalhatu Araf Specialist Hospital (DASH), Lafia, Nasarawa State, North-central, Nigeria. The hospital is a 450-bed tertiary health facility which provides all levels of healthcare services. The STC provides comprehensive ART as well as Sexually Transmitted Infections (STI) services.

The clinic receives cases of accidental exposures referred by other service providers from within and outside the facility. The services provided to patients including the antiretroviral (ARV) regimens provided for PEP are in line with the national guidelines (18).

Study design, population and method of sampling:

The study is a retrospective review which utilised secondary of patients of all ages who presented for post-exposure prophylaxis for HIV in the facility over 10 years (March 2013 to February 2023). All patients who had complete data of the desired variables were included in the study. A total of 335 patients had PEP during the period studied, but 103 of them had incomplete data and were therefore not included in the final analysis. The study was carried out between June 2023 to August 2023.

Data collection:

Data were collected from the post-exposure Prophylaxis (PEP) register and the patient's medical records folders. The PEP register has provision for collection of patients' information including the name, hospital and service identification numbers, age, sex, type of exposure, ART regimen, pre and post PEP HIV test, date PEP was commenced, and outcome of intervention. For this study, only data available and complete were extracted into a designed proforma.

The data include patient's identification (which was coded for confidentiality), age (to the nearest completed years), gender (male and female), type of exposure (occupational needle stick or blood slashes, sexual assault/ rape, non-occupational parenteral exposure (blades or bites), and unprotected sex or condom breakage), type of ARV regimen [Zidovudine (AZT), Lamivudine (3TC) and Efavirenz (EFV); or Tenofovir (TDF) and 3TC; or TDF, 3TC and EFV; or TDF, 3TC and Atazanavir/ ritonavir (ATV/r); or AZT, 3TC and Lopinavir/ ritonavir (LPV/r); or TDF, 3TC and Dolutegravir (DTG)].

Other information extracted from the patient's medical record folders include occupation of the patient, duration between exposure and presentation for PEP, HIV status of the source of exposure (negative, positive or unknown), and outcome of exposure at 1, 3 or 6 months (documented HIV test result or not documented).

Data analysis:

Data were entered into the Statistical Package for Social Science (SPSS) version 22 (SPSS Inc. Chicago, Illinois, USA). Recategorization of some variables including age group (1-5, 6-10 years etc) and duration of exposure before PEP (24 hours or less, 24-72 hours, and >72 hours) were done. Descriptive statistics of variables was carried out and presented as frequencies, means, percentages and range. Bivariate analysis to determine association of clinical and demographic variables was carried out with $p<0.05$ considered as statistical significance.

Ethical consideration:

Ethical approval for the study was obtained from the DASH Research Ethics Commi-

ttee. All patients' data were coded and personal identifiers removed. The PEP register and patients' folders were handled confidentially while extracting data by storing in locked cabinet when not in use. Soft copy of research data was stored in a password protected laptop accessible only to the researchers. Informed consent was not necessary for this study as the research did not involve contact with the patients.

Results:

A total of 335 patients were seen in the facility for PEP for HIV within the ten years period reviewed. However, only 252 had complete records and were included in the analysis. One hundred and thirty-two (52.4%) of the study subjects were females, with male to female ratio of 1:1.1. The age range of the patients was 1 and 55 years with a mean age of 26.25±11.807 years. Children aged 5 years or younger and those under 15 years constituted 7.5% (19/252) and 27.0% (68/252) respectively.

Majority (64.6%) of the study population were in the age range 21-40 years, while 53.1% were in the age range 21-35 years (Table 1). Medical doctors (16.3%), children (14.3%), nurses (12.7%) and civil servants (6.7%) were the major occupations. A total of 42.1% (106/252) patients were in health-related occupations while 57.9% (146/252) were either in non-health related occupations, children or unemployed (Table 1).

Table 1: Frequency distribution of the demographic characteristics of patients who had HIV post-exposure prophylaxis at Dalhatu Araf Specialist Hospital (DASH), Lafia, Nigeria

Demographic variables	Number	Percentage
Gender		
Male	120	47.6
Female	132	52.4
Age group (years)		
1-5	19	7.5
6-10	15	6.0
11-15	12	4.8
16-20	22	8.7
21-25	41	16.3
26-30	57	22.6
31-35	36	14.3
36-40	29	11.5
41-45	8	3.5
46-50	9	3.6
51-55	4	1.6
Mean age (26.25±11.81 years)		
Occupation		
Army	1	0.4
Artisan	3	1.2
Ward attendants	7	2.8
Banker	3	1.2
Business	9	3.6
CHEW	4	1.6
Child	36	14.3
Civil servant	17	6.7
Youth Corper	3	1.2
Medical Doctor	41	16.3
Driver	3	1.2
Engineer	1	0.4
Housewife	7	2.8
Journalist	1	0.4
Laboratory scientist	5	2.0
Laboratory technician	8	3.2
Laborer	1	0.4
Nurse	32	12.7
Police	2	0.8
Student	48	19.0
Student nurse	9	3.6
Trader	7	2.8
Unemployed	4	1.6
Type of occupation		
Health-related	106	42.1
Non-health related & unemployed	146	57.9

Table 2: Frequency distribution of the clinical characteristics of patients who had HIV post-exposure prophylaxis at Dalhatu Araf Specialist Hospital (DASH), Lafia, Nigeria

Clinical variables	Number	Percentage
Type of exposure		
Occupational-Needle stick/sharps injuries/splashes	109	43.3
Rape or sexual assault	73	29.0
Bites/blades/sharps in non-occupational setting	17	6.7
Unprotected sex/condom breakage	53	21.0
Time duration from exposure to PEP		
24 hours or less	183	72.6
24 -72 hours	57	22.6
More than 72 hours	12	4.8
Baseline HIV test of patient		
Negative -recorded	216	85.7
Not recorded	33	13.1
Declined testing	3	1.2
HIV status of source of exposure		
Negative	10	4.0
Positive	112	44.4
Unknown	130	51.6
ARV regimen given		
AZT+3TC+EFV	15	6.0
TDF+3TC+EFV	37	14.7
TDF+3TC+ DTG	89	35.3
TDF+3TC	4	1.6
TDF+3TC+ATV/r	90	35.7
TDF+3TC+LPV/r	17	6.7

AZT- Zidovudine; 3TC- Lamivudine; TDF – Tenofovir; DTG- Dolutegravir; ATV- Atazanavir; LPV- Lopinavir; r- ritonavir

Occupational exposure due to accidental needle stick/sharps injury or blood splash were the most frequent reason for seeking PEP with 109 (43.3%) accounting for it, while rape/sexual assault was the most common non-occupational reason, accounting for 29% (79/252), followed by unprotected sex or condom breakage in 53 (21.0%) cases (Table 2). The time duration from exposure incident to presentation for PEP ranged between 2 and 312 hours, with a mean time of 27.62 ± 38.56 hours.

Majority (72.6%) presented within the first 24 hours and most (95.2%) within 72 hours following exposure. The HIV status of the source of exposure was unknown in 130 (51.6%) cases, positive in 112 (44.4%) while 10 (4.0%) were HIV negative (Table 2). Two hundred and sixteen (85.7%) of the patients had recorded baseline HIV test and all were negative. Three (1.9%) participants declined testing and 33 (13.1%) had no baseline HIV test recorded. The most common ARV regimen given to the patients were TDF+3TC and ATV/r and TDF+3TC and DTG in 90 (35.7%) and 89 (35.3%) patients respectively (Table 2).

As shown in Table 3, 52.5% of males and 34.8% of females had occupational exposure (OR=2.066; 95% CI:1.25-3.43; p=0.005). Rape and sexual assault occurred in 55.4% of females and 0.8% of males (OR=0.007; 95% CI: 0.0001-0.05; p<0.0001). Unprotected sex and condom breakage occurred in 38.3% of males and 5.3% females (OR=11.1; 95% CI: 4.78-25.86; p<0.0001).

Compared with other age groups, patients in the age groups 26-30, 31-35, and 36-40 years had significantly higher risk of occupational sharps exposure (x^2=40.658; p< 0.0001), while those in the age groups 1-5, 6-10, 11-15 and 16-20 years had significantly higher risk of rape/sexual assault (x^2=79.561, p< 0.0001). Similarly, patients in the age groups 1-5 and 6-10 years, compared with other age groups, had significantly higher risk of non-occupational sharps exposure (x^2=38.17, p< 0.0001), while patients in age group 36-55 years had significantly higher risk of unprotected sex (x^2=24.303, p=0.0068).

About 93.4% of patients with health-related occupations had occupational sharps/ splashes HIV PEP exposure, and this was significantly higher than 6.9% in those with non-health related occupations/unemployed (OR= 192.34, p<0.0001). About 1.9%, 0.9% and 3.8% of patients with health-related occupation respectively had rape/sexual assault, non-occupational sharps injury, and unprotected sex HIV PEP exposures, compared to 48.6%, 10.4% and 33.6% respectively in those with non-health-related occupations/unemployed.

Patients with health-related occupations, compared to those with non-health related occupations/unemployed, had significantly higher risk of HIV PEP exposure through occupational sharps injury and blood splashes (OR=192.34; 95% CI: 70.74-522.96; p < 0.0001), and significantly lower risk of rape/ sexual assault (OR=0.02; 95% CI: 0.005-0.085; p< 0.0001), non-occupational sharps injury (OR= 0.077, 95% CI: 0.01-0.59; p= 0.0015) and unprotected sex (OR=0.078; 95% CI: 0.027-0.223; p< 0.0001).

Table 3: Bivariate analysis of demographic characteristics of patients and type of exposure/reasons for accessing HIV post-exposure prophylaxis

Demographic variables	Type of exposure			
	Occupational-needle stick/sharps/splashes of body fluids (n=109, 43.3%)	**Rape or sexual assault (n=73, 28.9%)**	**Bites/sharps in non-occupational setting (n=17, 6.7%)**	**Unprotected sex or condom breakage (n=53, 21.0%)**
Gender				
Male	63 (52.5)$^{+}$	1 (0.8)$^{++}$	10 (8.3)	46 (38.3)$^{+}$
Female	46 (34.8)	72 (55.4)	7 (5.3)	7 (5.3)
OR (95% CI)	2.066 (1.25-3.43)	0.007 (0.0001-0.05)	1.623 (0.59-4.41)	11.1 (4.78-25.86)
p	0.0052*	<0.0001*	0.452	<0.0001*
Age group (years)				
1-5	2 (10.5)	10 (52.6)$^{+}$	7 (36.8)$^{+}$	0
6-10	1 (6.7)	11 (73.3)$^{+}$	3 (20.0)$^{+}$	0
11-15	1 (8.3)	11 (91.7)$^{+}$	0	0
16-20	5 (22.7)	13 (59.1)$^{+}$	2 (9.1)	2 (9.1)
21-25	17 (41.5)	13 (31.7)	1 (2.4)	10 (24.4)
26-30	34 (59.6)$^{+}$	10 (17.5)	1 (1.8)	12 (21.1)
31-35	23 (63.9)$^{+}$	0	2 (5.6)	11 (30.6)$^{+}$
36-40	16 (55.2)$^{+}$	3 (10.3)	1 (3.4)	9 (31.0)$^{+}$
41-45	4 (50.0)	1 (12.5)	0	3 (37.5)$^{+}$
46-50	4 (44.4)	1 (11.1)	0	4 (44.4)$^{+}$
51-55	2 (50.0)	0	0	2 (50.0)$^{+}$
x^2	40.658	79.561	38.173	24.303
p	<0.0001*	<0.0001*	<0.0001*	0.0068*
Types of occupation				
Health-related	99 (93.4)$^{+}$	2 (1.9)$^{++}$	1 (0.9)$^{++}$	4 (3.8)$^{++}$
Non-health-related and unemployed	10 (6.9)	71 (48.6)	16 (10.9)	49 (33.6)
OR (95% CI)	192.34 (70.74-522.96)	0.020 (0.005-0.085)	0.077 (0.010-0.59)	0.078 (0.027-0.223)
p	<0.0001*	<0.0001*	0.0015*	<0.0001*

X^2 - Chi square; OR – Odds Ratio; CI – Confidence Interval; n - number; % - percentage; * - statistically significant at $p<0.05$; $^{+}$ - significantly higher; $^{++}$ - significantly lower

Table 4 shows the distribution of patients according to the time duration from exposure to presentation for PEP and it shows that there was no difference in time of presentation with 24 hours of exposure between the gender as 72.5% of the males and 72.7% of the females presented after 24 hours of exposure (OR=0.987; 95% CI: 0.568-1.721; p=1.000), but less number of males (1.7%) than females (7.6%) presented after 72 hours of exposure (OR=0.21; 95% CI:0.044-0.964; p=0.037).

Majority of the patients aged 1-5 years (84.2%), 31-35 (80.6%) and all those aged 51-55 years (100.0%) presented within the first 24 hours for PEP (x^2= 29.357, p=0.0011), while the number of those aged 6-10 years (33.3%) who presented after 72 hours of exposure was significantly higher than those in other age groups (x^2=18.698, p=0.0022).

Among the occupational groups, most of the medical doctors (97.6%) and all the laboratory scientists and technicians (100%, n=7) presented within 24 hours of exposure. Among patients who had occupational exposure, 88.1% presented within 24 hours and 99.1% within 72 hours, while 61.6% of the rape/sexual assault cases presented within 24 hours of exposure and 12.3% presented after 72 hours. Among the 112 patients who were exposed to HIV positive source, 90 (80.4%) and 101 (99.2%) presented within 24 hours and 72 hours respectively after exposure, while 86 (63.8%) of those exposed to a source with unknown HIV status presented within 24 hours and 11 (8.5%) presented after 72 hrs.

Significantly higher number of patients with health-related occupations (88.7%) presented within 24 hours of exposure compared to patients with non-health-related occupations (60.9%) (OR=5.02; 95% CI: 2.52-9.97; p<0.0001), while significantly lower number presented within 24-72 hours (OR= 0.29; 95% CI: 0.14-0.58; p=0.0002) and after 72 hours post-exposure (OR=0.05; 95% CI: 0.003-0.86; p=0.0016). Significantly higher number of patients with occupational sharps (88.1%) and non-occupational sharps/ bites (88.2%) exposures presented within 24 hours (x^2=32.123, p <0.0001), while significantly high number of patients with unprotected sex/condom break exposure (45.3%) presented within 24-72 hours (x^2=25.557, p< 0.0001), and significantly high number of rape /sexual assault exposure patients presented after 72 hours exposure (x^2=13.733, p=0.003).

Only 14 (5.6%) patients had documented outcome at least once at 1, 3 or 6 months after PEP, with all the documented results being HIV negative while, 94.4% had no documented follow-up or outcome in this study.

Table 4: Bivariate analysis of demographic and clinical characteristics of patients and duration of exposure before presenting for HIV post-exposure prophylaxis

Demographic variables	Duration of exposure before presenting for PEP		
	Within 24 hours (n=183, 72.6%)	**24-72 hours (n=57, 22.6%)**	**More than 72 hours (n=12, 4.8%)**
Gender			
Male	87 (72.5)	31 (25.8)	2 (1.7)$^{++}$
Female	96 (72.7)	26 (19.7)	10 (7.6)
OR (95% CI)	0.987 (0.568-1.721)	1.42 (0.79-2.57)	0.21 (0.044-0.964)
p	1.000	0.2917	0.037*
Age group (years)			
1-5	16 (84.2)$^{+}$	1 (5.3)	2 (10)
6-10	8 (53.3)	2 (13.3)	5 (33.3)$^{+}$
11-15	7 (58.3)	4 (33.3)	1 (8.3)
16-20	7 (68.2)	4 (27.3)	1 (4.5)
21-25	31 (75.6)	8 (19.5)	2 (4.9)
26-30	43 (75.4)	13 (22.8)	1 (1.8)
31-35	29 (80.6)$^{+}$	7 (19.4)	0
36-40	22 (75.9)	7 (24.1)	0
41-45	4 (50.0)	4 (50)	0
46-50	4 (44.4)	5 (55.6)	0
51-55	4 (100.0)$^{+}$	0	0
x^2	29.357	14.698	18.698
p	0.0011*	0.0996	0.0022*
Type of occupation			
Health-related	94 (88.7)$^{+}$	12 (11.3)$^{++}$	0^{++}
Non-health-related & unemployed	89 (60.9)	45 (30.8)	12 (8.2)
OR (95% CI)	5.02 (2.52-9.97)	0.29 (0.14-0.58)	0.05 (0.003-0.86)
p	<0.0001*	0.0002*	0.0016*
Type of exposure			
Occupational-needle/sharps/splashes	96 (88.1)$^{+}$	12 (11.0)	1 (0.9)
Rape or sexual assault	45 (61.6)	19 (26.0)	9 (12.3)$^{+}$
Non-occupational sharps/bites	15 (88.2)$^{+}$	2 (11.8)	0
Unprotected sex or condom breakage	27 (50.9)	24 (45.3)$^{+}$	2 (3.8)
x^2	32.123	25.577	13.733
p	<0.0001*	<0.0001*	0.0033*
HIV status of source of exposure			
Negative	10 (100.0)$^{+}$	0	0
Positive	90 (80.4)	21 (18.8)	1 (0.9)
Unknown	83 (63.8)	36 (27.7)	11 (8.5)$^{+}$
x^2	12.175	5.793	8.120
p	0.0023*	0.0552	0.0172*

x^2 - Chi square; OR – Odds Ratio; CI - Confidence Interval; n – number; % - percentage; * - statistically significant at $p<0.05$; $^{+}$ - significantly higher; $^{++}$ - significantly lower

Discussion:

The results of this study showed that people who access services in this facility are aware of the availability of PEP for HIV and are utilizing the service in a timely manner as indicated by the findings that majority 95.2% (240/252) of the patients who came for PEP did so within 72 hours following exposure. This finding is similar to a report from southeast Nigeria which found that half of the patients that reported for PEP did so within 24hours and most within 72 hours (19). These findings are encouraging and show that most people are aware of and seek PEP within the ideal time frame of 72 hours that PEP will be effective in preventing the acquisition of HIV following a single incident of exposure (4-6,10). The guidelines recommend that PEP should commence as soon as possible after exposure and not later than 72 hours for it to be effective. However, factors such as adherence to the medications and other factors such as avoiding drug-drug interactions must be observed for PEP to be effective (4-7,10,11).

This study found that more females (52.4%) than males (47.6%) presented for PEP, similar to other reports from Nigeria (18-21). However, Kuoanfack et al., (22) in 2019 reported from their study in Cameroon, West Africa that 70% of those who sought PEP in their study were males. The preponderance of the female gender in most of these reports may be due to the health-seeking behavior that has generally been shown to be higher in females. However, it may also be due to the fact that more females are victims of the risks that lead to potential exposure to HIV such as sexual assault and rape.

Majority (64.6%) of the patients in this study were aged between 21-40 years. Several reports found a preponderance of this age group in those seeking for PEP (20,21, 23,24). The most common reason for seeking PEP in the study was occupational exposure through needle stick or sharps or splashes from body fluids accounting for 43.3% (109/ 252). Rape or sexual assault accounted for the second commonest reason and the commonest non-occupational reason for PEP. These findings are similar to the report by Oyedum et al., (20) from southeast Nigeria. However,

it is in contrast to several reports that found rape and sexual assaults to be the commonest reason for seeking PEP (19,21,23,24). The lower number of rape and sexual assault compared to occupational exposure in our study may be due to the lack of reporting or the effects of stigma attached to rape thus leading to refusal to access care or report to authorities. Also, many healthcare workers in the faculty have knowledge of PEP following sensitization and display of posters on how to manage accidental exposures to potential source of blood-borne viruses by the hospital Infection Prevention and Control Committee (IPCC).

Majority (98.6%) of those who sought for PEP on account of rape or sexual assault in this study were females, which constituted 55.4% (72/132) of all the female patients (p<0.0001), and 75.3% of the rape/sexual assault occurred in children between 1 to 15 years and adolescents 16-20 years of age. Similar findings have been reported in studies from Nigeria and West Africa (19,22). The high number of children aged five years or younger who accessed PEP due to rape/sexual assault during the period of this study (13.7%, 10/73) is very disturbing, as this actually constituted 52.4% of exposure within that age group, and 43.9% (32/73) in children 15 years or younger. Reports from South Africa found that 15.8% of people accessing PEP for sexual assault were 10 years or younger (25). Another study from the United States reported that 12.7% of those exposed to rape or sexual assault were aged 10 years or younger and 30% were between 11 and 17 years of age (14). There is paucity of accurate data from Nigeria on rape and sexual assault and therefore, figures being reported in most studies including ours may be an underestimation mainly due to the under-reporting of reporting of rape and sexual assault. Many factors account for the lack of reporting including cultural, stigma and the apparent perception of lack of prosecution of perpetrators (26).

Most of those who sought HIV PEP for occupational reasons were those in health-related occupations such as doctors, nurses and laboratory workers. Occupational hazards especially needles stick and sharps injuries are common among HCWs who provide direct patient care including junior doctors and nurses. Most of these exposures occur in emergency settings (5,7,8). This study found that majority of the cases in rape/sexual assault were in non-health related occupations (students) and children. This finding is similar to reports from other studies from Nigeria and West Africa (19, 22, 24).

Unprotected sex or condom breakage accounted for the reason for PEP in 21% (53/252) of cases with males accounting for 86.6% (46/53), constituting 38.3% of exposure source for males compared to 5.3% for the females (p< 0.0001). This finding in similar to the report from West Africa where unprotected sex and condom breakage accounted for about 25% of cases seeking PEP (22). The high number of males compared to females engaging in unprotected sex or experiencing condom breakage may be due to the risk-taking behavior mostly associated with the male gender. Many of the sexual encounters are with a partner whose HIV serological status is unknown which might indicate casual sex. This study found that the HIV status of the source of exposure was unknown in 51.6% (130/252) of cases and only 44.4% were exposed to a known HIV positive source. Although a lot of information is available on the risks for acquiring HIV, a lot more needs to be done to educate people on risk reduction if the target of achieving HIV epidemic control is to be achieved.

Our study found significant associations between early presentation for HIV PEP (within 24 hours) and patients with health-related occupations, certain age groups (1-5, 31-35 and 51-55 years), occupational sharps exposure, and exposure to an HIV positive or negative source. While most of those with occupational and non-occupational sharps/bites presented within 24 hours, significantly high number of those with unprotected sex/condom break exposure presented within 24-72 hours, and significantly high number of those with rape/sexual assault exposure presented after 72 hours exposure. These findings are like those reported by Nwolisa et al., (21). Some factors that have been reported to influence access to PEP include awareness, level of education, knowledge of HIV status of source and female gender (4,16,19).

This study only recorded outcome in 5.6% (14/252) of the patients studied. Similar findings were reported in other studies where most patients who had PEP did not return for follow up with their outcome unknown (19, 20). The guideline for PEP recommends that follow up HIV serological test be carried out at one, three and six months after completion of the 28-day PEP regimen (4-8). However, as observed in this study, many patients do not return for follow up. Although patients need proper counselling before the commencement of PEP, this is often not the case as PEP is often commenced as an emergency. However, there is need to institute and carry out proper counselling of all patients who are placed on PEP to ensure adherence to their medications and also to complete the follow up for PEP including the HIV serological testing at baseline and at 1, 3 and 6 months after completion of the PEP ARV regimen. This will help improve the documentation and provide data on the rate of seroconversion following PEP if it does occur.

Conclusion:

This study has brought to the fore the need to put in place societal measures to reduce the rate of rape and sexual assault especially on children. There is also the need to ensure victims have access to PEP services as well as psychosocial and legal support as soon as possible. This will encourage improved reporting especially for victims of rape, thus reducing their risk of acquiring HIV infection. There is also need to institute measures to improve patients follow up and documentation of outcomes. This will help in the assessment of the success or otherwise of the post-exposure prophylaxis measures.

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Contributions of authors:

AES and BSO developed the study concept and design; AES, AAA, and AA were involved in data collection and entry; AES and BSO performed data analysis; AES, AAA, BSO, BIA, MM, AA and AMC contributed to the result interpretation and manuscript preparation. All authors approved the final manuscript.

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No conflict of interest is declared

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