

KNOWLEDGE, ATTITUDE AND PRACTICE OF HUMAN IMMUNODEFICIENCY VIRUS INFECTION POST-EXPOSURE PROPHYLAXIS AMONG RESIDENT DOCTORS IN A TERTIARY HOSPITAL, BENIN CITY, NIGERIA

¹EKUNDAYO, O. T., *²OGBAINI-EMOVON, E. A.

Department of ¹Accident and Emergency, University of Benin Teaching Hospital, Benin City, Nigeria. ² Institute of Lassa Fever Research and Control, Irrua Specialist Teaching Hospital, Irrua, Edo State, Nigeria

*Corresponding Author: epogbaini@yahoo.com

ABSTRACT

Infection with HIV is an occupational risk to health care workers, especially doctors, during treatment of patients. HIV post-exposure prophylaxis (PEP) is effective in preventing potential HIV infection following accidental exposure. The objective of this study was to assess the knowledge, attitude and practice of HIV post-exposure prophylaxis among resident doctors at the University of Benin Teaching Hospital (UBTH). A cross-sectional survey was conducted on 187 resident doctors at UBTH. Using a self-administered questionnaire, data was collected on socio demographic characteristics, attitude, and practice of HIV-PEP. Descriptive statistics were employed to analyze data. Majority (66%) of respondents had good knowledge of HIV-PEP. Ninety five percent agreed they would recommend HIV-PEP, 85% reported they would take PEP if accidentally exposed; 10.2% reported history of accidental exposure; and 47.4% of exposed respondents took PEP. Reasons for not taking PEP included lack of information about existing HIV-PEP policy and fear of stigmatization. The respondents had good knowledge of HIV-PEP, but poor practice. Thus, there is the need to reinforce education and training of doctors and other healthcare workers on HIV-PEP. Health care policy makers and employee should create more awareness by public display of HIV-PEP protocol and guidelines in the work place.

Key words: HIV, Post-exposure prophylaxis, Attitude, Knowledge, Practice, Health care workers.

31st May, 2014

Accepted: 18th July, 2014

Published: 31st July, 2014

INTRODUCTION

Infection with human immunodeficiency virus (HIV) remains a serious public health issue globally. Sub-Saharan Africa is the worst hit and Nigeria ranks among the top ten countries with the highest prevalence (WHO, 2011). Medical doctors, amongst other healthcare workers (HCWs) who have direct contact with patients, are at substantial risk of acquiring HIV infection from infected blood or body fluids through needle stick injuries or cuts, splashes in their eyes, mouth or their damaged or inflamed skin (Raphael and Judith, 2009; CDC, 2005). The risks for occupational transmission in these settings depend on the type and severity of the exposure. It has been estimated that the risk of HIV transmission after a percutaneous and mucosal membrane exposure to infected blood is 0.3% and 0.09% respectively (CDC, 2005; Bell, 1997). Whereas this risk appears low, there is every need to further reduce it, in view of the far-reaching social and medical implications of being HIV seropositive and indeed, the anxiety it causes among healthcare workers.

According to WHO (2005), “Post-exposure prophylaxis” (PEP) is an emergency short-term antiretroviral treatment to reduce the likelihood of HIV infection after potential exposure, either occupationally or through sexual intercourse. PEP consists of counseling, laboratory tests and or medication. Within the health sector, PEP should be provided as part of a comprehensive universal precaution package that reduces staff exposure to infectious hazards at work (WHO, 2005; HPA, 2008). The recommended Standard for PEP entails commencing treatment within 1 hour of potential exposure without exceeding 72 hours post-exposure; administration of First AID immediately after the injury which include washing of wounds and skin sites with soap and water (mucous membranes flushed with water only); and screening of the source person and the exposed health worker for HIV after obtaining informed consent and appropriate counseling. Furthermore, the HCW must be offered outpatient follow-up and HIV re-testing, while PEP medications should be maintained for 28 days, except

if the source patient is HIV-negative, in which case PEP is discontinued.

PEP treatment has been shown to reduce the risk of HIV infection by 81% (Karen et al, 2004). Despite compelling data and the universal acceptance of PEP as an effective means of reducing HIV transmission in the work place, it has abundantly been demonstrated in the literature, that there is poor implementation of PEP among medical doctors and other HCWs across various countries, especially in developing countries where protective supplies are limited and the rates of HIV infection in the patient population are high (Chacko and Isaac, 2007; Chen et al., 2001; Bosena and Chernet, 2010; Owolabi et al, 2011).

Resident doctors are supposedly younger doctors in the medical practice, undergoing further training in various medical specialties. They are a critical group in respect of this subject matter, because in the tertiary hospital setting, they are essentially the frontline doctors who perform several medical procedures, including invasive processes, which potentially expose them to blood borne pathogens, including HIV. The aim was to assess the knowledge, practice and factors associated with HIV post-exposure prophylaxis use among resident doctors at the University of Benin Teaching Hospital (UBTH), Benin City, Nigeria, as data from this study would reflect the current teaching and practice of HIV-PEP in our environment.

MATERIALS AND METHOD

Study design and Area: This was a descriptive cross-sectional study. UBTH is a foremost tertiary level referral hospital with about 750 beds, an accident/emergency unit, intensive care unit and a high capacity out-patient department. It is located in Benin City, Edo State, South-South Nigeria. It provides training for medical doctors and services for over 5 million people within Edo and the neighboring Ondo, Kogi and Delta State.

Sample size and sampling technique: The sample size was 187. This was determined using the single proportion formula $n = Z\alpha^2 Pq / d^2$ at 95% confidence interval, where: $Z\alpha = 1.96$; $P =$ prevalence (taken as 50% since there is no similar study in the area), $d =$ marginal error (taken as 5%). Using this calculation, we obtained 384 to be the sample size but since the exact number of source population of respondent is less than 10,000, we used the correction formula of $nf = ni / (1 + ni/N)$

where: $nf =$ corrected sample size; $ni =$ uncorrected sample size, and $N =$ total number of all the source population. We assumed a 10% non-response rate and administered 193 questionnaires. A stratified random sampling method was used to select participants for the study. The respondents were first stratified into the major disciplines and departments of medical practice available in the hospital viz; Internal Medicine, Surgery, General Out-patient (Family Medicine), Accident and Emergency, Pathology, and Community Health. The questionnaires were distributed proportionally across the different departments using simple random sampling technique.

Data collection: A structured, self-administered questionnaire was used to collect information on socio demographic characteristics and to assess their knowledge, attitude and practice towards PEP for HIV. A pretest to validate the questionnaire was conducted among 20 resident doctors who were not to be included in the study.

Grading of knowledge, attitude and practice: For assessment of knowledge, six questions were asked. A mark of two was given for every correct answer and zero for incorrect answer. Respondents who scored nine and above were graded as having good knowledge; scores between five and eight were considered as having average knowledge; while scores of four and below were rated as poor knowledge. Selected knowledge questions were also scored independently, where $\geq 60\%$ of respondents gave correct answer, knowledge was graded as good knowledge, while poor grade was awarded where $< 60\%$ of respondents gave the correct answer. Similarly, selected questions on attitude and practices of the respondents were graded on the same percentage scale.

Ethical Consideration: Ethical approval was obtained from the Ethical Committee of University of Benin Teaching Hospital. Verbal consent was obtained from each of the respondents after the purpose of the study had been explained. Confidentiality of participants was ensured throughout the study.

Data analysis: All data obtained from questionnaire forms were entered into a Microsoft Windows based statistics program -the Statistical Package for Social Sciences (SPSS version 16.5 data; SPSS Inc. Chicago, IL). Descriptive statistics which included frequency tables were used to compute percentages and averages.

RESULTS

One hundred and eighty seven questionnaires were completed and returned, giving a response rate of 97.0%. The mean age of the respondents was 38 years, with a range of between 26 and 50 years. Majority 91(48.7%) were between 31-35 years of age. More than two-third 135(72.2%) were male and 130(69.5%) were married. By rank, 114 (61.0%) of the respondents were registrar, 73(39.0%) were senior registrars (Table 1).

In all, 124(66.0%) of the respondents had good knowledge of HIV-PEP, 54(29.0%) had average knowledge, while 9 (5.0%) had poor knowledge. When the data was analyzed on the basis of specific knowledge, 169 (90.4%) stated they have heard of HIV-PEP, 150 (80.2%) knew that HIV-PEP was effective in preventing HIV transmission. One hundred and fourteen (60.9%) identified correctly when HIV-PEP should be commenced, while 120 (64.2%) had correct knowledge of how long PEP drugs should be taken. When asked of first AIDS

steps to be taken after accidental needle stick injury, majority 120 (64.2%) knew that wound should be washed with soap and water, 75 (40.1%) incorrectly stated that wound should be massaged and a strong disinfectant applied. Majority 139 (74.3%) agreed that exposure should be reported to staff clinic. (Table 2)

On attitude and practice of HIV-PEP, majority (178; 95.2%) reported they would recommend PEP to others, 159 (85.0%) agreed that they would take PEP if accidentally exposed to HIV. In terms of history of exposure, only 19 (10.2%) of the respondents have had accidental exposure of one form or the other, in the previous one year. Of the 19 respondents who had exposure, only 9 (47.4%) received PEP, and only 2 (22.2%) of respondents that started PEP drugs completed it. Among the respondents who did not commence PEP, 4 (40.0%) stated they were not aware of an existing PEP policy and protocol at the time of exposure, 3 (30.0%) believed that the exposure source was negative, while 3 (30.0%) had fear of stigmatization.

Table 1: Socio-demographic characteristics of respondents

Characteristic	Variables	Number (%) (n=187)
Age group (years)	26 - 30	34 (18.2)
	31 - 35	91 (48.7)
	36 – 40	48 (25.7)
	41 – 45	9 (4.8)
	46 – 50	5 (2.6)
Sex	Male	135 (72.2)
	Female	52 (27.8)
Marital status	Married	130 (69.5)
	Single	57 (30.5)
Rank	Senior Registrar	73 (39.0)
	Registrar	114 (61.0)
Religion	Christian	183 (97.9)
	Islam	4 (2.1)

DISCUSSION

This study demonstrated that our respondents had a good knowledge of HIV-PEP. This is in agreement with similar studies done in Nigeria (Owolabi et al, 2011; Agaba et al, 2012), Uganda (Alenro et al., 2009) and Libya (Ben Saoud et al., 2013). Our findings however differ from studies in India and Ethiopia (Varghese et al, 2003; Chacko and Isaac, 2007; Bosenia and Chernet, 2010) were considerably low proportion of doctors were knowledgeable about HIV-PEP. This disparity in knowledge among doctors could be due to differences in the questions asked and parameters used in the assessment of

knowledge in the various study. For instance, in the Ethiopian study, a score of $\geq 75\%$ was applied to mean adequate knowledge and only 6 doctors were in the cohort of health workers that was studied. A standardized questionnaire would allow for a better comparison of knowledge.

The level of exposure of 10.2% found in our study is in agreement with the report from Italy (Bandolier, 2003), which estimated the occupational exposure of surgeons and physicians to blood-borne pathogens to be 12.0% and 3.9% respectively. In the United Kingdom and United State of America, higher

exposure rates have been reported (Chen et al, 2009; Martin and Makary, 2007). The differences in the documented exposure rates may be due to the use of different time of reference. For example, in this study, we calculated exposure based on a period of 12 months, while other studies based their assessment

on overall exposure as long as the respondents could remember. Another possible reason for the observed differences in exposure rate is the level of adherence to the Universal Standard for infection control which varies between hospitals.

Table 2: Respondents knowledge, attitude and practice of HIV- PEP

Question/Answer (n=187) Knowledge	Number (%)
Is HIV-PEP effective in preventing HIV transmission? Yes No Don't Know	150(80.2) 7(3.8) 30(16.0)
How long HIV-PEP drugs should be taken? 1 month 3 months Don't know	120 (64.2) 24 (12.8) 43 (23.0)
What are the first AID measures after an accidental needle stick injury? Wash expose area with soap and water and apply dressing? Yes No Don't know	120(64.2) 35(18.7) 31(16.6)
Report exposure to staff clinic? Yes No Don't know	139(74.3) 12 (6.4) 36(19.2)

Table 3: Respondent's attitude and practice of HIV-PEP

Questions/Answer (n=187): Knowledge	Number (%)
Are you willing to recommend HIV- PEP to others (n = 187)? Yes No Undecided	178(95.2) 1(0.5) 8(4.3)
Would you commence HIV-PEP if accidentally exposed (n = 187)? Yes No Undecided	159(85.0) 13(7.0) 15(8.0)
Have you had any accidental exposure to HIV in the past one year (n = 187)? Yes No	19(10.2) 168(89.8)
Did you receive HIV-PEP after the exposure (n = 19)? Yes No	9(47.4) 10(52.6)
Did you complete HIV-PEP (n = 9)? Yes No	2(22.2) 7(77.8)
Reason for not commencing HIV-PEP (n = 10)? Not aware of PEP protocol at the time Assumed exposure source was negative Fear of stigmatization	4(40.0) 3(30.0) 3(30.0)

Whereas a remarkable proportion (greater than 80%) of the respondents stated they would take HIV-PEP in the event of any accidental exposure and would also recommend PEP to others, the good knowledge and statements from the doctors were not matched with appropriate practices. We found a gap between knowledge and practice, especially in the aspect of utilizing existing PEP facilities. For instance, of the 19 respondents who gave history of accidental exposure, nine (47.4%) received PEP and only two (22.2) completed the drugs. This is worrisome, because doctors are expected to know better and as advocates of preventive medicine, should practice what they preach. The issue of low uptake of PEP is not limited to our environment. Previous studies in Ethiopia (Bosena and Chernet, 2010), Uganda (Alenyo et al, 2009), and Kenya (Taegtmeier et al, 2008) have reported poor uptake of PEP among exposed health care workers. The reasons given by the respondents for not taking PEP included; lack of awareness of existing PEP protocol at the time of exposure, uncertainty about confidentiality and fear of stigmatization, and the assumption that the exposure source was negative. The implications of these remarks are that the availability of HIV-PEP in the hospital was probably not well publicized and the fear of being stigmatized following a positive HIV test result remains a barrier to accessing HIV-PEP in our environment.

The challenge therefore, is to increase awareness of HIV- PEP and the training of doctors and indeed all HCWs to recognize and appreciate the risk involved in accidental exposure and to completely embrace standard precaution and HIV-PEP in the workplace. Some important limitations of this study include the focus on one professional group and the restriction to one health facility. Therefore, our findings should not be generalized for the geographical environment

We conclude by recommending that concerted effort be geared at training and re-training of doctors and all HCWs on standard precaution and on the importance of HIV-PEP in reducing HIV transmission. Policy makers in the health sector and employers of health workers should ensure that HIV-PEP protocols are provided, clearly written, and administered to every employee at induction, and displayed publicly in the work place.

ACKNOWLEDGEMENTS

The authors are grateful to the Executive Committee of the Association of Resident Doctors UBTH and all doctors who participated in this study.

REFERENCES

- Agaba, P.A., Agaba, E.I., Ocheke, A.N., Daniyam, A.C., Akanbi, O.M. and Okeke, N.E. (2012). Awareness and knowledge of human immunodeficiency virus post exposure prophylaxis among Nigerian family physicians. *Niger. Med. J.*; 50(3): 155-160.
- Alenyo, R., Fualal, J. and Jombwe, J.J. (2009). Knowledge, attitude and practices of staffs towards post-exposure prophylaxis for HIV infection at Mulago Hospital in Uganda. *East Central Afri. J. Surg.*; 14(2):2.
- Bandolier, E. (2003). Occupational exposure to hospital employees in Italian hospitals over 5.5 years, Evidence-based health care. Assessed 10 May 2014. Available online at www.ebandolier.com
- Bell, D.M. (1997). Occupational risk of human immunodeficiency virus infection in health-care workers: An overview. *Am. J. Med.*; 102:9–15.
- Ben-Saoud, B.I., Elsour, F.I., Elbargathi, M.A., Elmarak, M.A. and Ali S.E. (2013). Knowledge, attitudes and practices of health workers in Benghazi, Libya towards post exposure prophylaxis for HIV. *Ibnosina J. Med. Biomed. Sci.*; 5(6): 318-323.
- Bosena, T. and Chernet, H. (2010). Assessment of HIV post-exposure prophylaxis use among health workers of Government health institutions in Jimma zone, Orominya region, South-West Ethiopia. *Ethiop. J. Health Sci.*; 1: 55-64.
- CDC (2013). Updated U.S. Public Health Service guidelines for the management of occupational exposures to HIV and recommendations for post exposure prophylaxis. Available online at <http://www.cdc.gov/hiv/resources/factsheets/hcwprev.htm>. Accessed June 5 , 2014.
- Chacko, J. and Isaac, R. (2007). Percutaneous injuries among medical interns and their knowledge and practice of post-exposure prophylaxis for HIV. *Indian J. Pub. Health*; 51(2):127-9.
- Chen, Y.M., Fox, E. and Rogers, A.C. (2001). Post-exposure prophylaxis for human immunodeficiency virus: knowledge and experience of junior doctors. *Sexually Transm. Infect.*; 77: 444-45.
- Health Protection Agency (2008). HIV and AIDS: Information and Guidance in the Occupational Setting. Availableonline at <http://www.hpa.org.uk/>

Bloodborne Viruses And Occupational Exposure/ Guidelines/ Accessed June 5, 2014.

Karen, B., Helen, H., Warren, P. and Zinhle, N. (2004). Post-Exposure Prophylaxis (PEP) in South Africa: Analysis of Calls to the National AIDS Help line. Available online at www.cadre.org.za. Accessed June 5, 2014.

Martin, A. and Makary, M.D. (2007). Needle stick Injuries. Johns Hopkins Center for Surgical Outcomes: International Sharps Injury Prevention Society, South Jordan, Utah. *N. Engl. J. Med.*; 356 (26): 2693-2699.

Owolabi, R.S., Alabi, P., Ajayi, S., Daniel, O., Ogundiran, A., Akande, M.T. and Onafowokan, T. (2011). Knowledge and practice of post-exposure prophylaxis (PEP) against HIV infection among healthcare providers in a tertiary hospital in Nigeria. *J. Inter. Assoc. Physicians AIDS Care*; 11(3): 179-183.

Raphael, J.L. and Judith, S.C. (2009). Post-exposure prophylaxis for HIV infection: *N. Engl. J. Med.* 361:1768-75.

Taegtmeier, M., Suckling, R.M., Nguku, P.M., Meredith, C., Kibaru, J., Chakaya, J.M., Muchela, H. and Gilks, C.F. (2008). Working with risk: occupational safety issues among health care workers in Kenya. *AIDS Care*; 20(3): 304-310.

Varghese, G.M., Abraham, O.C. and Mathai, D. (2003). Post-exposure prophylaxis for blood borne viral infections in healthcare workers. *Postgrad. Med. J.*; 79: 324–328.

WHO (2011). Global Health Observatory Data Repository. Data on the size of the HIV/AIDS epidemics: number of people living with HIV. Available online at who.int/gho/data/node.main. Accessed May 28, 2014.

WHO/ILO, (2005). Occupational and Non-occupational Post-exposure Prophylaxis for HIV infection (HIV-PEP), Joint ILO/WHO Technical Meeting for Development of Policy and Guidelines, Geneva. Available online at http://www.ilo.org/public/english/region/eurpro/moscow/areas/aids/ilo_who_guidelines. Accessed May 20, 2014.

AUTHORS' CONTRIBUTION

Ekundayo, O.T., originated idea and collected data. Ogbaini-Emovon, E.A., analyzed data, conceptualized and wrote up the manuscript.