

Level of Knowledge, Attitude and Practice of Sudanese Dentists toward Post Exposure Prophylaxis in Khartoum City

Tibyan Abdelazim Elsadig¹, Elhadi Mohieldin Awooda¹

1. Department of Restorative Dentistry, faculty of dentistry, University of Medical Sciences and Technology, Sudan

Abstract:

Background: Health care workers are at increasing risk to occupational exposure to blood borne infections. Although avoiding contact with blood is the optimum way to prevent these exposures, still appropriate post-exposure management is an important element in work place safety.

Objectives: To evaluate level of knowledge, attitude and practice toward post exposure prophylaxis (PEP) among Sudanese dental practitioners.

Materials and methods: A cross sectional study was carried out among 161 dental practitioners from Khartoum dental teaching hospital (KDTH) and Academy Dental Teaching hospital (ADTH) self-administered questionnaire including demographic data and questions regarding knowledge, attitude and practice of post-exposure prophylaxis. Comparison between different variables by Chi-Square test with level of significance set at P value of <0.05.

Results: Majority 122 (75.2%), had inadequate knowledge about post exposure prophylaxis. But in case of PEP for HIV/HBV; majority 144 (89.4%) had a positive attitude. A high proportion of the respondents, 140 (87.0%), had been vaccinated against HBV. Among all of the respondents, 102 (63.4%) had previous exposure to needle stick injury and 145 (90.1 %) did not take PEP. Among the respondents who did not take PEP, 30 (27.8%) of them stated that their reason was absence of PEP service while 30 (27.8%) said because of lack of support and encouragement to report.

Conclusion: Inadequate level of knowledge and practice among Sudanese dental practitioners regarding post-exposure prophylaxis, while majority had good attitude. Previous exposure to needle stick injury was considered high (63.4%). Training and implementation of PEP protocol is highly recommended.

Key words: HIV/HBV, Needle Stick Injury, Post-exposure prophylaxis, Sudanese Dentists.

Date of Submission: 28-10-2019

Date of Acceptance: 12-11-2019

I. Introduction

Post exposure prophylaxis is any preventive medical measurements started after exposure to a pathogen in order to prevent disease occurrence, these measurements are taken in case of exposure to blood borne diseases like hepatitis B, hepatitis C, and HIV. They constitute a risky occupational hazard to all health care workers especially in developing countries like Sudan. [1] Reports worldwide show that every year almost one million health care workers get needle stick injury thus hundreds of these healthcare workers already got infected with different types of blood borne diseases. [2]

A needle stick injury which is the main source of exposure carries a risk of 6 to 30% chance that an exposed person will be infected by hepatitis B, 2% chance of getting infected by hepatitis C and chance of 0.3% will be infected with HIV. [3] These percentages vary with the type and severity of the exposure for example the risk of transmission of HIV after percutaneous exposure is approximately estimated to be 0.3% while the risk of transmission after mucosal membrane exposure is approximately 0.09% [4], and the percentage also varies with the prevalence of the infected population. [5] This occupational exposure results in 2.5% of HIV diseased personnel and 40% of hepatitis B and C according to the WHO reports [6].

The exposure is underestimated statistically in developing countries include ing Sudan; because workers fail to report risks of exposure thus compromising proper post exposure management which takes into consideration screening, post exposure prophylaxis (PEP) and others [2], this lack of report is due to lack of knowledge about the role of post exposure prophylaxis in prevention, and also because of self-blaming. [7]

Post exposure prophylaxis services include first aid counseling, including the assessment of risk of exposure to the Infection, screening, and depending on the outcome of the exposure assessment, the prescription of a 28-day course of Antiretroviral drugs given in case of HIV suspicion, and injection of immunoglobulin and vaccine in case of hepatitis B suspicion, then appropriate support and follow-up.[8] Guidelines for occupational

exposure to HIV where put in 1997 by the department of health these guidelines stated that post exposure prophylaxis should be given in a form of triple drugs which are Zidovudine, Indinavir and Lamivudine. [9] These drugs should be taken within 1 hour of exposure to get the maximum effectiveness, in the face of the clear guidelines health care workers fail to follow them putting these workers in undue risk.

Under the circumstances of increase burden of blood borne diseases among health care workers and the great amount of failure to report exposure or risks of exposure [10] it is crucial to assure health care workers safety where lack of knowledge may lead to devastating consequences after exposure including transmission of hepatitis B and C and also being HIV positive. Thus assessing knowledge, attitude and practice of dental practitioners toward PEP will increase the awareness and will change the behavior of this group toward this sensitive subject. limited researches were conducted regarding this topic in developing countries including Sudan. [11]

The main objective of this study was to evaluate level of knowledge, attitude and practice toward post exposure prophylaxis among Sudanese general dental practitioners and dental house officers. Specific objectives were to determine the prevalence of needle stick injuries, to assess knowledge attitude and practice toward PEP. Also to compare the knowledge and practice of PEP between house officers and general practitioners, male and female dentists and among dental practitioners with and without previous exposure to needle stick injury.

II. Materials and Methods

A descriptive cross sectional study among 161 (house officers and general dental practitioners) working in two main out of four dental teaching hospitals in Khartoum locality, Sudan. These two hospitals were Dental Teaching Hospital (KDTH) and Academy Dental Hospital (ADTH). The study was conducted during the period from 1st of March – 1st of April 2018. Non clinical practitioners with the administration, undergraduate dental students, Registrars, Specialists or Consultants were excluded.

Simple stratified random sampling was used, where general practitioners were a group and house officers formed another group, and then a number of participants were selected randomly from each group. Sample size was calculated using (Epi Info Sample Size Calculator). From a total of 277 dental practitioners working at ADTH and KDTH the sample size was determined to be 161 with 95% confidence level, of these 42 (26%)

From the ADTH and 119 (74%) from the KDTH. Of the participants working at ADTH 22 (53%) are medical officers and 20 (47%) are house officers while of the participants working at KDTH 32 (27%) are medical officers and 87 (73%) are house officers.

A list of dental practitioners in deferent departments were provided by the hospitals administrators from them participants were selected by systematic random sampling, the first one was determined by simple random sampling.

Self-administered questionnaire modified from Okoh M *et al. study* [12], it contains 29 close ended questions regarding the knowledge, attitude and preventative methods regarding PEP. The questionnaire was already validated, so we did not pilot it.

Data were analyzed by SPSS version 21 (SPSS Inc., Chicago, USA). Comparison between variables was done using Chi square test with level of significance set as P value<0.05.

The study was approved by Ethical committee of the University of Medical Sciences and Technology, and permissions were taken from the administrative authorities of the two hospitals. Participants were requested to participate voluntary and those who accepted signed informed written consent.

III. Results

A total of 161 questionnaires were distributed and all of them were attained with 100% response rate. More than half 99 (61.5%) of the participants were females and 62(38.5%) were males, 101 (62.7%) of them were house officers and 60 (37.3%) were general dental practitioners.

Table 1 shows knowledge of the dental practitioners about PEP. The majority of the respondents have been exposed to needle-stick injury before, where 76.4% of them have heard about PEP from clinical training. Almost two thirds of the respondents knew when to initiate PEP, however few of them knew the maximum delay for PEP, or what are the situations in which PEP should be used. Also few of the respondents knew about the efficiency of PEP, and only 19.9% knew how long an exposed individual should be on PEP.

Table 1: knowledge of dental practitioners about post exposure prophylaxis

Question	Response	Frequency &percentage
Previous exposure to needle stick injury	Yes	102(63.4%)
	No	53(32.9%)
	I don't know	6(3.7%)
Hearing about post-exposure prophylaxis before	Yes	123(76.4%)

	No	23(14.3%)
	I don't know	15(9.3%)
Source of the information about PEP	Clinical training	66(41%)
	Mass media	15(9.3%)
	Friends	23(14.3%)
	Journals	4(2.5%)
	From previous exposure	6(3.7%)
	Lectures	39(24.2%)
Situations where post exposure prophylaxis should be indicated	Patients at high risk	21(13%)
	Patients known with HIV or hepatitis	38(23.6%)
	Any needle stick injury during work	84(52.2%)
	I don't know	17(10.6%)
The maximum time to delay the post-exposure prophylaxis	12 hours	41(25.5%)
	24 hours	19(11.8%)
	48 hours	19(11.8%)
	72 hours	39(24.2%)
	I don't know	43(26.7%)
Preferable time to take post-exposure prophylaxis	Within 1 hour	100(62.1%)
	After 6 hours of exposure	7(4.3%)
	After 12 hours of exposure	5(3.1%)
	I don't know	49(30.4%)
Effectiveness of post-exposure prophylaxis for HIV	Not effective	12(7.5%)
	80-100%	29(18%)
	60-80%	0(0%)
	30-50%	7(4.3%)
	10-30%	4(2.5%)
	I don't know	83(51.6%)
Effectiveness of post-exposure prophylaxis for Hepatitis B	Not effective	12(7.5%)
	80-100%	22(13.7%)
	60-80%	0(0%)
	30-50%	19(11.8%)
	10-30%	4(2.5%)
	I don't know	88(54.75%)
Effectiveness of post-exposure prophylaxis for Hepatitis C	Not effective	23(14.3%)
	80-100%	10(6.2%)
	60-80%	15(9.3%)
	30-50%	13(8.1%)
	10-30%	3(1.9%)
	I don't know	97(60.2%)
Length of time to take post-exposure prophylaxis	28 days	32(19.9%)
	40 days	12(7.5%)
	6 months	34(21.1%)
	For life	5(3.15)
	I don't know	78(48.4%)

Table 2 shows attitude of dental practitioners about PEP, Majority of the dental practitioners didn't attend any form of PEP training and about half of them didn't know any of PEP guidelines but after all most of them acknowledged the importance of PEP in and importance of its training for behavioral changes, almost all of them agreed that PEP guidelines should be available in work area ,also they settled on the believe that PEP reduces the likelihood of being diseased and to prevent further infection, more than half of them thought that it should be taken with any type of sharp injury, they had mixed opinions when it came to the believe that PEP should is not important if the exposure is not with patient of known HIV positive or hepatitis carrier

Table 2: Attitude of dental practitioners about post-exposure prophylaxis

Question	Response	Frequency & percentage
Previous attendance and training course about post-exposure prophylaxis	1	21(13%)
	No	135(83.9%)
	I don't know	5(3.1%)
Knowledge about the post-exposure prophylaxis guide lines	Yes	57(35.4%)
	No	92(57.1%)
	I don't know	12(7.5%)
Importance of post-exposure prophylaxis	Yes	142(88.2%)
	No	12(7.5%)
	I don't know	7(4.3%)
Approval that training of post-exposure prophylaxis is important for behavioral change	Yes	144(89.4%)
	No	5(3.1%)

Approval that there should be post-exposure prophylaxis guidelines in work areas	I don't know	12(7.5%)
	Yes	154(95.7%)
	No	1(0.6%)
Believe that post-exposure prophylaxis reduces the likelihood of being diseased	I don't know	6(3.7%)
	Yes	138(85.7%)
	No	5(3.1%)
Believe that post-exposure prophylaxis prevents further infection	I don't know	18(11.2%)
	Yes	131(81.4%)
	No	17(10.6%)
Agreement that post-exposure prophylaxis is indicated for any type of sharp injuries (needle sticks, spreader stick, and elevatoretc)	I don't know	13(8.1%)
	Yes	86(53.4%)
	No	36(22.4%)
Agreement on the believe that post-exposure prophylaxis is not important if the exposure is not with patient of known HIV positive or hepatitis carrier	I don't know	39(24.2%)
	Yes	65(40.4%)
	No	63(39.1%)
	I don't know	33(20.5%)

Table 3,4,5 represents practice among participant, majority 140 (87%) of the respondents were vaccinated against hepatitis B, half of them stated that their organization distributes PEP written policies, majority of them use protective equipment and wash their hands before contacting patient's blood or body fluids ,more than two thirds of them declared that there is proper handling and disposing of sharp instruments, most of the participants haven't been placed on PEP before mainly because PEP service wasn't available 30(27.8%) or because of lack of the support 30(27.8%).

Table3: practice of Hepatitis B vaccination, management of occupational exposure and previous medication after Needle stick injury.

Question	Response	Frequency& percentage
Hepatitis B vaccination	Yes	140 (87%)
	No	6 (3.7%)
	I don't know	15 (9.3%)
Hospital development and distribution of written policies for the management of occupational exposure	Yes	39 (24.2%)
	No	82 (50.9%)
	I don't know	40 (24.8%)
Previous placement on PEP after needle stick injury	Yes	9 (5.6%)
	No	145 (90.1%)
	I don't know	7 (4.3%)

Table 4: Infection control measures practiced by the participants

Question	Response	Frequency& percentage
Use of personal protective equipments when anticipating contact with patient blood and body fluid	Yes	129(80.1%)
	No	18(11.2%)
	I don't know	14(8.7%)
Hand washing in your practice a routine after contact with infected patients	Yes	148(91.9%)
	No	6(3.7%)
	I don't know	7(4.3%)
Proper handling and disposing of sharp instrument after and before use	Yes	141(87.6%)
	No	13(8.1%)
	I don't know	7(4.3%)

Table 5: Barrier that prevent participants from getting post exposure prophylaxis

Reason for not getting post exposure prophylaxis	Frequency& percentage
Unaware of the existence of PEP service and protocol	26 (24.1%)
Lack of understanding the value of reporting exposures	3(2.8%)
Fear of stigma and discrimination	19(17.6%)
Lack of support and encouragement to report	30(27.8%)
PEP service is unavailable	30(27.8%)

The correlation between background variables and the level of knowledge and attitude, P values for all the background variables was found to be > 0.05 which is considered statistically insignificant, where the relation between knowledge and gender, degree of respondent and previous sharp object exposure was of P value of 0.179, 0.170, 0.665 respectively. On the other hand, the relation between attitude and gender, degree of respondent and previous exposure had a P value of 0.062, 0.538, and 0.871 respectively.

IV. Discussion

Blood borne diseases forms an issue among health care workers, and occupational exposure to these blood borne diseases puts them in an unnecessary threat that could have been prevented, thus the center of disease control (CDC, USA) have endorsed standard precautions so as to reduce health care worker's occupational exposure. [13] Despite these clear standard precautions, occupational exposure still happens, thus more studies related to knowledge, attitude and practice of health care workers towards the post-exposure management should be done so as to update policies on post-exposure prophylaxis. Similar to previous studies from different countries [12,14,15,16], majority of the respondents have heard about post exposure prophylaxis. This can be attributed to the fact that they heard about it during clinical practice as reflected in our study and similar studies [12].

More than half of the participants stated that PEP should be started within one hour of exposure (immediately), which is comparable to a similar study conducted in Mumbai [17], and inconsistent with findings of similar studies that reflected poor knowledge regarding the matter in question [12,18,19]. The difference might be because of the difference on the level of awareness among the different populations. When PEP is given within the first hour of exposure a maximum benefit is obtained. This is because when a person is exposed to HIV, systemic infection does not occur immediately, but infection of dendritic cells in the mucosa and skin occurs at the site of inoculation during the first 24 hours, but still it could be delayed to a maximum of 48-72 hours, after which it is less effective in preventing infection. [17]

In our study a low percentage of dental practitioners had correct knowledge regarding the time span for which PEP should be undergone. This is in agreement with finding highlighted by Chogle *et al.* [17]. But less than that reported by Agaba *et al* [16] where most of the participants responded correctly. PEP is normally continued for 4 weeks (28 days) following occupational exposure to HIV [4].

This study shows that majority of the participants have answered less than half of the knowledge questions correctly which means they had poor knowledge, these findings are similar to findings in a study conducted in Zimbabwe which showed that more than half of the respondents had poor knowledge [20]. But inconsistent with other studies that recorded fewer percentage of participants with poor knowledge [18]. This low level of knowledge should draw attention to the seriousness of the situation. This can be explained given that majority of respondents only heard about PEP during clinical practice, while lectures, journals and mass media failed to deliver comprehensive coverage of the protocol [12].

Few of the participants of this study have attended any sort of training about PEP This might be due to the fact that training or seminars on PEP and standard precautions are not usually performed for them in their institutions, This is less than the Mathewos *et.al*[18] report from Ethiopia, and also lower than the Okoh M[12] et al report where less than quarter of the participants have attended some form of training , but its higher than the kasat VO. [15] report where none of their interns attended training and few of the post graduates did . This can be attributed to difference in training programmes.

The dental practitioners in this study displayed a good attitude towards PEP for HIV/HBV. majority of these participants agreed on the importance of PEP for HIV/HBV. This finding was lower than that reported by Mathews *et al* [18] and also lower than the Okoh M *et al.* [12] et al report, but higher than that reported from a study In Uganda. [19]

In this study over half of the respondents have been exposed to blood borne risky conditions. This finding is less than that recorded in India [21], and greater than that obtained in Italy [22]. the difference between these studies might be due to the difference in the clinical settings and precaution regulations. Only 5.6% of the respondents have been placed on PEP after an exposure which is considered very low in comparison to other studies where Mathews *et al* [18] reported that of the exposed respondents have undergone PEP, also in Okoh M [12]. More than one third of the exposed respondents took PEP. This result as stated by the respondents is due to lack of the PEP service, support and encouragement, fear of stigmatization and discrimination and lack of awareness of the existence of the PEP service and protocol.

The relationship between knowledge, attitude and background variables was found to be statistically insignificant. This can be explained given that most of the participants were fresh graduates and thus having less clinical experience. Also the undergraduate curricula along with post graduate training do not cover the protocol in a comprehensive, inclusive manner.

The strength of this study is represented in the fact that Sudan has four main dental hospitals that accommodates general dental practitioners and house officers and all of them are located in Khartoum state meaning that this study can be generalized to the whole country, also data collection was via questionnaires without human interventions, thus being convenient, it was not expensive, and all the participants were available at the same place and all kindly agreed to participate. On the other hand, limitations are that some of the answers might have not been honest (social desirability bias) and since this was not face to face questionnaire some questions might have differently interpreted by participants.

V. Conclusion

The level of knowledge and practice of PEP among dental practitioners in Khartoum dental teaching hospital and academy dental hospital was poor. Majority of the participants (63.4%) were exposed to blood borne risky conditions, and very few of them utilized PEP due to lack of the institution PEP service and support.

References

- [1]. Sagoe-Moses C, Pearson RD, Perry J, Jagger J. Risks to health care workers in developing countries. *N Engl J Med.* 2001; 345(7):538–41.
- [2]. CDC. Updated U.S. public health services guidelines for the management of occupational exposures to HBV, HCV, and HIV and recommendations for post exposure prophylaxis. *MMWR.* 2001; 50(RR11):1-42.
- [3]. IJOEM T. Canadian Center for Occupational Health and Safety. *The International Journal of Occupational and Environmental Medicine.* 2010 Sep 21; 1(4):204-5.
- [4]. CDC. Updated U.S. Public Health Service guidelines for the management of occupational exposures to HIV and recommendations for post exposure prophylaxis. September 30, 2005 / 54(RR09):1-17 .
- [5]. Berry AJ, Greene ES. The risk of needle sticks injuries and needle stick transmitted diseases in the practice of anesthesiology. *Anesthesiology* 1992; 77: 1007-21
- [6]. World Health Report. 2002. Reducing risks, promoting healthy life; World Health Organization. Geneva. <https://www.who.int/whr/2002/en/>.
- [7]. Wilburn SQ, Eijkemans G. Preventing needle stick injuries among healthcare workers: aWHO-ICN collaboration. *Int J Occup Environ Health.* 2004;10(4):451-6
- [8]. Updated U.S. Public Health Service Guidelines for the Management of Occupational Exposures to HBV, HCV, and HIV and Recommendations for Post exposure Prophylaxis, *MMWR,* June 29, 2001/50(RR11); 1–42.
- [9]. United Kingdom Health Departments. Guidelines on post-exposure prophylaxis for healthcare workers occupationally exposed to HIV. (https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/203139/HIV_post-exposure_prophylaxis.pdf)
- [10]. The Konlan KD, Aarah-Bapuah M, Kombat JM, Wuffe GM. The level of nurses' knowledge on occupational post exposure to hepatitis B infection in the Tamale metropolis, Ghana. *BMC health services research.* 2017; 17(1):254. DOI 10.1186/s12913-017-2182-7
- [11]. The burden of disease from sharps injuries to health-care workers at national and local levels. Geneva, World Health Organization, 2005 (WHO Environmental Burden of Disease Series, No. 1
- [12]. Okoh M, Saheeb BD. Assessment of knowledge, attitude and practice of postexposure prophylaxis against blood-borne viral infection among dental surgeons in a teaching hospital. *Southern African Journal of Infectious Diseases.* 2017 Mar 23; 32(1):17-22.
- [13]. Centers for Disease Control. Perspectives in disease prevention and health promotion update: universal precautions for prevention of transmission of human immunodeficiency virus, hepatitis B virus, and other blood borne pathogens in health-care settings. *MMWR.* 1988;37: 377–88)
- [14]. Ahmed SI, Hassali MA, Aziz NA. An assessment of the knowledge, attitudes, and the risk perceptions of pharmacy students regarding HIV/AIDS. *Am J Pharm Ed.* 2009; 73(1):1-7.
- [15]. Kasat VO, Saluja H, Ladda R, Sachdeva S, Somasundaram KV, Gupta A. Knowledge, attitude and practices toward post exposure prophylaxis for human immunodeficiency virus among dental students in India 2014; 4(4): 543–548.
- [16]. Agaba PA, Agaba EI, Akanbi MO, Daniyam CA, Ocheke AN, Okeke EN. Awareness and knowledge of human immunodeficiency virus post exposure prophylaxis among Nigerian Family Physicians. *Niger Med.* 2012; 53(3): 155–160
- [17]. Chogle NL, Chogle MN, Divatia JV, Dasgupta D. Awareness of post-exposure prophylaxis guidelines against occupational exposure to HIV in a Mumbai hospital. *National Medical Journal of India.* 2002 Mar 1; 15(2):69-71.
- [18]. Mathewos B, Birhan W, Kinfe S, Boru M, Tiruneh G, Addis Z, Alemu A. Assessment of knowledge, attitude and practice towards post exposure prophylaxis for HIV among health care workers in Gondar, North West Ethiopia. *BMC public health.* 2013 Dec; 13(1): doi: 10.1186/1471-2458-13-508
- [19]. Alenyo R, Fualal J, Jombwe JJ: Knowledge attitude and practice of staffs towards post exposure prophylaxes for HIV infection at Mulango hospital in Uganda. *East and central African J Surgery* 2009, 14(2):99–102.
- [20]. Monera T, Ncube P: Assessment of Knowledge, Attitude and practice of health care workers on Occupational HIV post exposure prophylaxis at Zimbabwean referral hospital. *J Int AIDS Soc* 2012, 15(4)
- [21]. Tetali S, Choudhury PL: Occupational exposure to sharps and splash: Risk among health care Providers in three tertiary care hospitals in south India. *Indian J Occup Environ Med* 2006, 10(1):35–40
- [22]. Aminde LN, Takah NF, Dzudie A, Bonko NM, Awungafac G, Teno D, Mbuagbaw L, Sliwa K. Occupational post-exposure prophylaxis (PEP) against human immunodeficiency virus (HIV) infection in a health district in Cameroon: Assessment of the knowledge and practices of nurses. *PLoS One.* 2015 16;10(4):e0124416.

Tibyan Abdelazim Elsadig. “Level of Knowledge, Attitude and Practice of Sudanese Dentists toward Post Exposure Prophylaxis in Khartoum City”. *IOSR Journal of Dental and Medical Sciences (IOSR-JDMS)*, vol. 18, no. 11, 2019, pp 76-81.