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Research Article

ASSESSMENT OF KNOWLEDGE, ATTITUDE AND PRACTICE TOWARDS HUMAN IMMUNODEFICIENCY VIRUS POST EXPOSURE PROPHYLAXIS AMONG ACADEMICIANS, INTERNS AND STUDENTS IN DENTAL AND MEDICAL COLLEGES IN PUNE CITY: A CROSS SECTIONAL QUESTIONNAIRE BASED STUDY

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ABSTRACT

A cross sectional questionnaire based study was undertaken to assess and compare knowledge, attitude and practice towards Human immunodeficiency virus (HIV) post exposure prophylaxis (PEP) amongst 400 participants including academicians, interns and students in two dental and medical colleges -Pune. Self-administered, structured, pretested, validated, close ended questionnaire was used. Unpaired t-test, analysis of variance (ANOVA), Tukey's post hoc test, Z-test and chi square test for proportion were used. Of 400 questionnaires, 385 were returned giving a response rate of 96.25%. Significant proportion 342(88.8%) out of 385 participants, were found to have inadequate knowledge about PEP for HIV. Out of 55(4.2%) participants exposed to potentially infectious agents, eight initiated anti-retroviral therapy. Only three out of eight who initiated the therapy completed the course. Even though the attitude was favourable towards HIV PEP, adherence to guidelines for HIV PEP was poor which justify the need for a formal training and reinforcement.

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INTRODUCTION

HIV is social disease and it took pandemic form within short span of time affecting 40 million people throughout the globe (Aggarwal A et al, 2012). Blood and body fluid (BBF) exposures are the most common safety problems among healthcare workers (HCWs). HCWs are exposed to BBFs in the course of their work (Sangwan BR et al, 2011). Consequently, they are at risk of infection with blood borne viruses (BBVs) including human immunodeficiency virus (HIV), hepatitis B virus (HBV) and hepatitis C virus (HCV) (De Villiers HC et al, 2007). Globally about 3 million health care workers experience percutaneous exposures to blood borne pathogens each year exposing 1,70,000 to HIV. This exposure may result in 1000 HIV cases with more than 90% of these infections occurring in developing countries (Buowari OY, 2012). India has a population of approximately 1.2 billion and the estimated number of people living with HIV is 2.09 million (MoHFW, 2012-13).

The attributable fraction for HIV through percutaneous exposure in the various regions ranges between 0.5–11% (Prüss-Üstün A et al, 2003). So far, no cure or vaccine has been discovered that could aid in the eradication of HIV/AIDS (Aggarwal A et al, 2012). Each day thousands of healthcare

workers, around the world, suffer accidental occupational exposures during the course of their role of caring for HIV infected patients. These injuries can result in a variety of serious and distressing consequences ranging from extreme anxiety to chronic illness and premature death for the individual involved (Kulkarni RR et al, 2013). Avoiding occupational blood exposures by adhering to universal precautions and post exposure management are integral components of a complete program to prevent HIV infection following occupational exposure and are important elements of workplace safety (Mashoto KO et al, 2013). Dental and medical academicians, interns and students form an important component of health care workers. Their knowledge, attitude and behaviour about HIV PEP are very important for prevention of infection and work place safety. Unfortunately, on literature review it was found that majority of health care workers have inadequate knowledge about post-exposure prophylaxis despite being at risk of infection (Kulkarni RR et al, 2013; Mukherjee S et al, 2013; Chogle NL et al, 2002). Thus this study was taken up to assess and compare the knowledge, attitude and practice towards HIV PEP amongst dental and medical academicians, PG students, interns, IV year and III year students in Pune city.

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MATERIALS AND METHODS

A cross sectional questionnaire based study was conducted amongst academicians, interns and students after obtaining approval from Institutional Research Board and necessary permission from the authorities of the 2 dental and 2 medical colleges in Pune. The study was conducted from 1st April, 2014 to 30th June, 2014.

A pilot study was conducted to check for content validity of the questionnaire where cronbach's alpha was found to be 0.8. The sample size was determined by using single proportion formula ($n = [Z \alpha / 2] 2 p [1-p] / d^2$) at 95% confidence interval, where, $Z \alpha / 2 = 1.96$, $p = 15\%$ prevalence of knowledge of HIV post exposure prophylaxis from the pilot survey and $d = 5\%$ of marginal error was taken. Using this calculation, minimum sample size obtained was 198 which was rounded off as 200 study participants from each branch. These 200 participants in each branch were divided into 5 groups i.e. academicians, PG students, interns, IV and III year students each having 40 participants. Further each group was stratified into 20 males and 20 females. All dental and medical academicians, interns and students willing to participate with informed consent were included in the study. Those who were absent on three consecutive visits were excluded. Systematic random sampling technique was used to obtain required sample size from the list of persons from whom informed consent was obtained.

Data related to HIV PEP was collected using self-administered, pretested, validated, close ended, structured questionnaire. It consisted of demographic details followed questions related to knowledge, attitude and practice about HIV PEP. There were 11 knowledge based questions out of which 9 questions truly judged the knowledge of the participants. For these 9 questions, each correct answer was awarded 1 mark while incorrect answer was awarded 0 marks. Those who scored more than 75% (≥ 7 correct answers out of 9) were considered as having adequate knowledge while score less than 75% (<7 correct answers) corresponded to inadequate knowledge. For 5 attitude based questions, the favourable or positive response was awarded 1 mark while unfavourable or negative response was scored 0 marks. Scores were based on the number of answers indicating positive attitude of the participant. The practice towards HIV PEP was assessed based on 5 questions. The questionnaire was distributed by the principal investigator personally to each of the study participant and collected back immediately.

Data analysis was done using IBM Statistical Package for Social Sciences (Statistics for Windows, Version 21.0. Armonk, NY: IBM Corp.). The p value less than 0.05 was considered statistically significant at confidence interval of 95%. Chi-Square test for proportion was used to compare the proportion among the 5 groups i.e. academicians, PG students, interns, IV year students, III year students. Z-test was used to compare between the proportion of two branches (i.e. dental and medical). Unpaired t-test compared the mean knowledge scores between the 2 branches. ANOVA followed by Tukey's post hoc test was used to compare the mean knowledge scores amongst the 5 groups.

RESULTS

Three hundred and eighty five questionnaires were returned back out of 400 thus giving a response rate of 96.25%. The demographic details of study participants are depicted in table 1. The mean age of academicians, post graduate students, interns, IV year students and III year students was 38.73+9.48 years, 26.86+4.09, 22.7+1.08, 21.57+1.41 and 20.59+0.70 respectively.

A significant number of respondents i.e. 250 (64.9%) said that they knew about HIV PEP guidelines ($p < 0.05$). One hundred and sixty one (41.8%) respondents did not know if there was any HIV PEP policy in the hospital. The exact preferable time of initiation of HIV PEP, maximum delay to initiate HIV PEP and duration of the course of HIV PEP was known to only 90 (23.3%), 121 (31.4%) and 67 (17.4%) respondents respectively. Correct indications of HIV PEP were known to 192 (49.8%) participants and 177 (45.9%) knew the drugs used in HIV PEP. HIV PEP drugs have side effects were correctly known to 174 (45.1%) respondents.

A total 247 (64.1%) participants correctly stated the first aid procedure at the site of injury as washing the site with copious amount of soap and water. Ideal contact person in case of exposure is consultant working in HIV medicine / infectious diseases / public health medicine was known to 213 (55.3%) participants. The academicians and PG students fared better than interns and knowledge was least among the IV year and III year students ($p < 0.05$). The knowledge score and status based on scoring system is depicted in table 2 and 3 respectively.

A majority of the respondents were willing to treat the HIV positive patients and wanted the guidelines to be displayed in the workplace area. Though very less number of respondents had attended HIV PEP training program, majority thought that it was important (Figure 1).

Out of 55 (4.2%) respondents exposed to potentially infectious agents only eight initiated anti-retroviral therapy. Three out of eight who initiated the therapy completed the course. The practice towards HIV PEP on the exposure to potentially infectious material is depicted in table 4.

Table 1 Demographic details of the study participants

Characteristic	Frequency	Percentage
Branch		
Dental	192	49.9%
Medical	193	50.1%
Group		
Academician	77	20%
Post Graduate student	79	20.5%
Intern	77	20%
IV year student	76	19.7%
III year student	76	19.7%
Gender		
Male	192	49.9%
Female	193	50.1%

Table 2 Intergroup comparison of correct responses to knowledge based questions

Knowledge based questions	Percentage of total correct responses	Percentage of correct responses by group				
		Academicians	P.G. Students	Interns	IV year students	III year students
The preferable time to take to take HIV PEP	23.4	35	36.7	32.4	3.9	7.8
The maximum delay to take HIV PEP	31.4	46.7*	43	25.9	22.3	18.4
The duration of the course of HIV PEP	17.4	37.6*	24	16.8	5.2	2.6
Indication for HIV PEP	49.9	23.3	26.5	25.9	7.8	6.5
Drugs for HIV PEP regimen	46.0	20.7	18.9	24.6	5.2	17.1
Any side effects of HIV PEP	45.2	61.	73.4*	42.8	23.6	23.6
Universal precautions to be usually observed while treating patients	79.5	85.7	93.6*	81.8	59.2	76.3
First-aid procedure to be followed at the site of injury	64.2	76.6*	70.8	58.4	50	64.4
Ideal contact person in case of exposure	55.3	70.1*	69.6	61	25	50

Chi- Square test for proportion * $p < 0.05$

Table 3 Knowledge status based on scoring system

Category	Adequate knowledge (>75% score)	Inadequate Knowledge (<75% score)	Knowledge Scores Mean± SD
Branch			
Dental	8.9%	91.2%	3.97±1.90
Medical	13.5%	86.5%	4.32±1.88
Group			
Academicians	22.1%	77.9%	5.03±1.92
P.G. Students	17.7%	82.3%	5.04±1.72
Interns	11.7%	88.3%	4.18±1.87
IV year students	1.3%	98.7%	2.93±1.89
III year students	2.6%	97.4%	3.50±1.88
Gender			
Male	8.3%	91.6%	3.98± 1.84
Female	13.9%	86.0%	4.31± 1.91

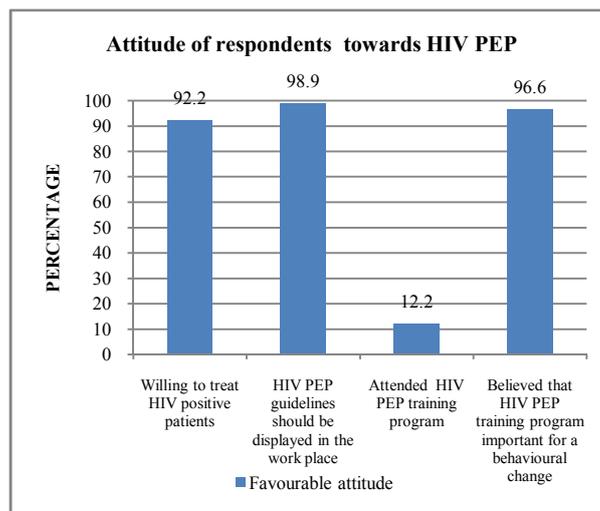
SD= standard deviation

Table 4 Overall response to practice based questions related to HIV PEP

Questions	Responses	Frequency (percentage)
Exposed to potentially infectious materials (blood, sexual and tissue fluids) or needle stick / sharp injury	Yes	55 (4.3%)
	No	320 (83.1%)
	Don't know	10 (2.6%)
Initiated HIV PEP after exposure	Yes	8 (4.5%)
	No	47 (85.5%)
	Lack of awareness of the existence of PEP service /protocol	6 (12.8%)
Reason for not using PEP for HIV	Uncertain about confidentiality	1 (2.1%)
	Fear of being stigmatized	2 (4.3%)
	Negligence	4 (29.8%)
	Treatment not required	24 (51.0)
If initiated then, did you complete the prescribed course for HIV PEP?	Yes	3 (37.5%)
	No	5 (62.5%)
If not completed then, reason for not completing the course of the drug	Fear of adverse effects	0
	Assuming that it was enough	0
	Assuming that the drug was not effective	1 (20%)
	Source was tested negative for HIV	4 (80%)

DISCUSSION

HCWs are exposed to risk of accidental exposures to potentially infectious materials during their regular clinical work. Appropriate management of these accidental exposures is necessary for preventing occupationally acquired HIV infection. This necessitates sound knowledge of required protocol to be followed post exposure.



Graph 1 Overall attitude of respondents

In our study, significant number of respondents 342 (88.84%) were found to have inadequate knowledge about PEP for HIV which is similar to other studies (Kulkarni RR *et al*, 2013; Chogle NL *et al*, 2002; Kasat VO *et al*, 2014; Pavithran VK *et al*, 2015). This is a matter of concern because we as health care professionals need to know regarding HIV PEP. Though each dental/medical college and hospital in our study had HIV PEP policy, it might be implemented poorly. As a result, HIV PEP guidelines are seldom followed. Thus a special emphasis should be given for teaching HIV PEP to students and regular special training programs for reinforcement should be carried out.

Only 90 (23.4%) of the total respondents were aware that HIV PEP should be preferably started within one hour and the results are similar to a study conducted in Uganda (Alenyo R *et al*, 2009) and Nigeria (Esin IA *et al*, 2011). This is a matter of concern as health professionals take must be aware of HIV PEP guidelines which directly affects their health.

Question on the maximum delay to take HIV PEP showed that only 126 (32.7%) respondents knew that it should be taken within 72 hours. This is in contradiction with the results found in study conducted in Nigerian family physicians (Agaba PA *et al*, 2014) and among health care workers of Gondar university hospital, North West Ethiopia (Mathewos B *et al*, 2013) wherein 83.3% and 72.3% respondents respectively knew the correct answer. There were 67 (17.4%) of the respondents who could correctly state that the duration of HIV PEP was 28 days.

Similar results (15.3%) were obtained in study conducted amongst health workers in Lagos University Teaching Hospital (Sarah OA *et al*, 2014). The results are not in consensus with other studies (Mukherjee S *et al*, 2013; Esin IA *et al*, 2011; Agaba PA *et al*, 2014; Mathewos B *et al*, 2013; Sarah OA *et al*, 2014; Sudhir *et al*, 2013). The 28 days duration of HIV PEP was known to 47 (24.3%) medical participants as compared to only 20 (10.4%) dental participants and the difference was statistically significant. This branch wise difference may be attributed to more emphasis given on HIV PEP and the presence of adequate HIV PEP policy in medical hospital.

The drugs prescribed for HIV Post Exposure Prophylaxis regimen were answered correctly by 177 (46%) of the respondents. The results were lower as compared to other studies (Mukherjee S *et al*, 2013; Agaba PA *et al*, 2014) and may be attributed to difference in the work place environment, the sample size, the composition of the study participants and different level of awareness in different population.

The academicians and PG students significantly fared better as compared to interns and under graduate students when asked if there were side effects of HIV PEP drugs, which may be attributed to clinical and theoretical experience being higher in academicians and PG students as compared to other groups. There were 213 (55.3%) respondents who knew correctly whom to contact ideally in case of exposure which is higher as compared to other studies (Chogle NL *et al*, 2002; Esin IA *et al*, 2011).

In our study only 47 (12.2%) of the respondents had ever attended training program about HIV PEP. This is in contrast to study conducted in North West Ethiopia (Mathewos B *et al*, 2013) wherein 65.1% of the participants had attended training program about HIVPEP. Our study showed that 18.1% of interns and 13.92% of PG students had attended training program about HIV PEP which is in contrast with study conducted by Kasat VO *et al* (2014) wherein only 3.2% dental students had attended training program about HIV PEP. The differences may be attributed to different level of emphasis given on HIV PEP in the curriculum leading to different levels of awareness among different populations thus resulting in difference in the attendance of training program for same.

There were 381 (99.0%) respondents who believed that guidelines for HIV post exposure prophylaxis should be displayed in the work place which is in contrast with study conducted by in North West Ethiopia (Mathewos B *et al*, 2013).

There were 55(4.3%) of the respondents who were exposed to potentially infectious materials (blood, sexual and tissue fluids) or needle stick / sharp injury. This is lower as compared to other studies (Alenyo R *et al*, 2009; Mathewos B *et al*, 2013; Tebeje B and Hailu C 2010). The differences may be attributed to the amount of time spent and nature of work done in the clinics. Due to fear of stigma there might be under reporting of the incidence.

In this study out of 55 exposed respondents only 8initiated HIV PEP which is lower than study conducted in North West Ethiopia wherein 49 out of 66 exposed respondents 8 initiated HIV PEP (Mathewos B *et al*, 2013).This may be attributed to

lack of adequate knowledge regarding HIV PEP and inadequate HIV PEP policy.

Only three out of eight who initiated HIV PEP, completed the course while five did not. The results are lower as compared to study conducted in North West Ethiopia (Mathewos B *et al*, 2013) wherein 39 out of 49 of those who initiated, completed the HIV PEP regime. This might be due to difference in the type and severity of exposure and HIV status of the source of infectious material. Out of the five who did not complete the course, one stopped the treatment assuming that the drug was not effective whereas for four others, the source was tested negative for HIV and thus did not complete the course.

Based on results it can be concluded that majority of the participants had inadequate knowledge regarding HIV PEP. Even though the attitude of most of the respondents was favourable towards HIV PEP, adherence to guidelines for HIV PEP was poor. In order to improve the knowledge and practices regarding HIV PEP there is need to organize special mandatory orientation program or formal training program dedicated to HIV PEP on yearly basis for all the health care workers in the hospital for constant up gradation of knowledge and reinforcement.

The strength of this study is that it had targeted majority of the dental and medical colleges in Pune city and thus the sample taken was representative. The limitation of the study is that the participation was voluntary and sample size was small. The exposure to potentially infectious material was self-reported. A common threat to the validity of self-reports that can lead to information bias is social desirability and recall bias. There is a possibility that socially desired and undesired behaviours have been over- and under-estimated in this study, respectively.

It is suggested that further longitudinal studies should be done to study the pattern of reporting and utilization of HIV PEP. Qualitative surveys can provide a valuable insight to inform barriers to accessing and completing post-exposure prophylaxis from a beneficiary perspective.

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