

Original Research Article

A study on prevalence of occupational exposure to HIV among medical interns and their knowledge, attitude and practice of post-exposure prophylaxis for HIV in a teaching hospital

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ABSTRACT

Background: Every day thousands of healthcare workers around the world suffer accidental occupational exposures while managing patients. Interns take maximum load of providing medical care in the in-patient and out-patient departments of any medical college and are thus at a great risk of occupational exposure to all kinds of blood borne pathogens including human immunodeficiency virus (HIV). We aimed to assess the prevalence of occupational exposure to HIV among medical interns and their knowledge, attitude and practice regarding post exposure prophylaxis of HIV.

Methods: A cross-sectional study was conducted among all (94) medical Interns who were working in BIMS hospital Belagavi, Karnataka, India during September and October 2015. Data was collected using self-administered questionnaire, which had 18 questions to assess knowledge and 8 questions to assess attitude and 13 questions to assess practice related to occupational exposure and utilization of post exposure prophylaxis (PEP) for HIV.

Results: Majority of them i.e., 59 (62.7%) had adequate knowledge and 91 (96.80%) had good attitude towards occupational exposure to HIV and PEP for HIV whereas practice was poor. Out of 94 study participants, 16 (17%) had occupational exposure to HIV out of which 5 (5.13%) had taken PEP for HIV but none of them completed the course.

Conclusions: There is considerable gap between knowledge and practice against occupational exposure to HIV and inadequate knowledge of post-exposure prophylaxis of HIV emphasizes the need for continuous onsite training of interns with supportive supervision and monitoring of their activities.

Keywords: HIV, Medical interns, Occupational exposure, Post exposure prophylaxis

INTRODUCTION

The human immunodeficiency virus (HIV) infection is a global pandemic. HIV continues to be a burden globally and presents serious public health problems in developing countries especially in India. At the end of 2015, an estimated 36.7 million people were living with HIV worldwide and 1.1 million people died from AIDS related illnesses.¹ India has 21.17 lakh people living with

HIV and 67.6 thousand people died from AIDS related illnesses.²

The HIV status of a majority of patients is unknown at the time of initial presentation to the hospital. Despite following 'Universal precautions', the health care workers may get accidentally exposed to HIV while performing invasive procedures and/or handling high risk fluids. Most exposures do not result in infection but the

risk of infection varies with the type of exposure, the amount of blood involved and the amount of virus in the patient's blood and whether the post exposure prophylaxis (PEP) was taken within recommended time.

An occupational exposure is contact with blood, visibly bloody fluids or other body fluids that are potentially infectious (i.e. semen, vaginal secretions, cerebrospinal fluid, synovial fluid, pleural fluid, peritoneal fluid, pericardial fluid, amniotic fluid and breast milk) or tissues and laboratory specimens that contain concentrated virus to which standard precautions apply, during the performance of an health care worker's duties.³

Modes of exposure include percutaneous injuries, mucous membrane exposures, non-intact skin exposures and bites.

Healthcare worker (HCW)

A person who works in the facility, whether paid or unpaid, who has the potential for exposure to infectious materials, including body substances, contaminated medical supplies and equipment, contaminated environmental surfaces, or contaminated air.³

Percutaneous injury

An exposure event occurring when a needle or other sharp object penetrates the skin. This term is interchangeable with "sharps injury."³

Sharps

Any object that can penetrate the skin including, but not limited to, needles, scalpels, broken glass, broken capillary tubes, and exposed ends of dental wires.^{3,4}

Mucous membrane exposure

Contact of mucous membrane (e.g., eyes, nose, or mouth) with the infectious fluids, tissues, or specimens listed in Occupational exposure.^{3,4}

Non-intact skin

Areas of the skin that have been opened by cuts, abrasions, dermatitis, chapped skin, etc.³

Every day thousands of healthcare workers, around the world, suffer accidental occupational exposures during the course of their role of caring for 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. There is a wide range of blood borne infections that a HCW can be exposed to in the course of their work, including hepatitis b and c, cytomegalovirus, Epstein - Barr virus, malaria, and human immunodeficiency virus

(HIV). HIV infection is probably the most serious and causes the highest level of anxiety amongst HCW's.⁵

As voluntary counselling and testing (VCT) and antiretroviral therapies (ART) for HIV disease are expanding, the number of people living with HIV who require invasive procedures is increasing, thus raising the potential risk of injury to HCW's and transmission of HIV. In addition, patients who are on ART live longer and there will be an increasing patient load for HCW's, again increasing the potential for occupational exposure and transmission of HIV.⁴

The average risk of HIV transmission after a percutaneous exposure to HIV-infected blood has been estimated to be approximately 0.3% and after a mucous membrane exposure approximately 0.09%.⁵

Globally, there are 3, 27,000 (range 61,000 to 1,300,000) sharps injuries to HCW's from HIV contaminated blood. Post exposure prophylaxis (PEP) is effective in reducing the HIV infection rate by 81%. Even taking into account this highly effective role of PEP, it is estimated that 1,000 HCW's are infected with HIV each year (range 200 – 5,000).⁵ It is also estimated that 4.4% (range 0.8% to 18.5%) of all HIV infections amongst HCW's are due to occupational injuries. For health-care workers worldwide, the attributable fractions for percutaneous occupational exposure to HBV, HCV and HIV are 37%, 39% and 4.4%, respectively.⁶

"Post exposure prophylaxis" (PEP) refers to the comprehensive management given to minimize the risk of infection following potential exposure to blood-borne pathogens (HIV, HBV, HCV). This includes: first aid, counseling, risk assessment, relevant laboratory investigations based on informed consent of the source and exposed person, Provision of short term (4 weeks) of antiretroviral drug treatment and Follow up.⁷

Interns at a very early stage of their professional career take maximum load of providing medical care in the in-patient and out-patient departments of any medical college across the world and more so in a developing country like India, and are thus at a great risk of occupational exposure to all kinds of blood borne pathogens including HIV.

The objective of our study was to find out the prevalence of occupational exposure to HIV among medical interns and to assess the knowledge, attitude and practice of post exposure prophylaxis for HIV among them.

METHODS

Study design and area

A cross sectional study was conducted among Interns doing their compulsory rotatory internship in the month of September and October 2015 in Belagavi Institute of

Medical Sciences (BIMS) Hospital, Belagavi, Karnataka, India.

Sample size and sampling technique

There were totally 94 interns working in the hospital during September and October 2015. All 94 interns were included in the study. For prevalence of occupational exposure to HIV, interns who had completed at least 3months/ 1 major (Medicine, Surgery, OBG, Paediatrics) clinical posting were taken.

Data collection

Data was collected using structured, self-administered questionnaire, which had 18 questions to assess knowledge and 8 questions to assess attitude. Those who score 70% and above were considered as knowledgeable and having good attitude respectively^[8]. There were 13 questions to assess practice related to occupational exposure and utilization of PEP for HIV among medical Interns.

Data analysis

Data was entered and analyzed using MS excel. Results were summarized in frequencies and percentages and presented in tables.

RESULTS

Sociodemographic characteristics

Totally there were 94 medical interns working in the hospital during the months of September and October of which 64 (68%) were of regular batch and 30 (32%) were of odd batch. Age of the participants varied from 22 to 25yrs and there were 59 (63%) males and 35 (37%)

females. The odd batch interns 30 of them had completed 11 months of internship and regular batch interns 64 of them had completed 6 months of internship by the time of this study. All of them had completed at least 1 major clinical posting/ had 3 months of clinical work exposure.

Knowledge assessment

There were 18 questions to assess knowledge regarding occupational exposure to HIV and PEP of HIV. Overall Majority of them 59 (62.7%) had adequate knowledge. Table 1 shows the questions with responses to which number of interns had opted for. In our study 70 (74.4%) of them had correctly identified non-infectious fluid for HIV, 92 (98%) of them had correctly identified personal protective equipment's, 61 (65%) of them knew where to dispose the sharp. In assessment of exposure status, 70 (74.4%) of them knew the conditions which are classified as mild exposure, 62 (84%) of them knew moderate exposure and 79 (84%) of them knew severe exposure. Very few of them 11 (12%) knew low risk categorization of the source of occupational exposure to HIV and 77 (82%) of them knew high risk source. Initiation of PEP for HIV within 2hrs up to 72hrs was correctly answered by 41 (44%) of them, complete course of PEP for HIV as 4 weeks was correctly answered by 55 (58.5%) of them. Recent NACO regimen for PEP of HIV was correctly answered by 22 (23.4%) of them, Availability of PEP drugs for HIV in our hospital were correctly answered by 89 (95%) of them and reporting of occupational exposure correctly answered by all.

Attitude assessment

There were 8 questions to assess attitude of medical interns towards occupational exposure and PEP of HIV. Overall 91 (96.80%) had good attitude. Figure 1, shows the questions their responses and number of interns opted for individual response.

Table 1: Knowledge of medical interns about occupational exposure to HIV and PEP for HIV.

Questions	Correct No (%)	Wrong No (%)
Identification of non-infectious fluid for HIV	70* (74%)	24 (26%)
Disposal of sharps in white puncture proof container	61 (65%)	33 (35%)
Recapping of needles should not be done after use	27 (29%)	67 (71%)
Antiseptics should not be used at the site of exposure	36* (38%)	58 (62%)
Conditions which are considered as mild exposure	70* (74%)	24 (26%)
Conditions which are considered as moderate exposure	57* (61%)	37 (39%)
Conditions which are considered as severe exposure	79* (84%)	15 (16%)
Low risk categorization of source of exposure	11 (12%)	83 (88%)
High risk categorization of source of exposure	77 (82%)	17 (18%)
Current regimen of PEP for HIV as per NACO	22 (23%)	72 (77%)
Timing of initiation of PEP for HIV	41 (44%)	53 (56%)
Duration of complete course of PEP for HIV	54 (57%)	40 (43%)
Availability of PEP drugs for HIV in hospital	90* (96%)	04 (4%)

*Multiple answers.

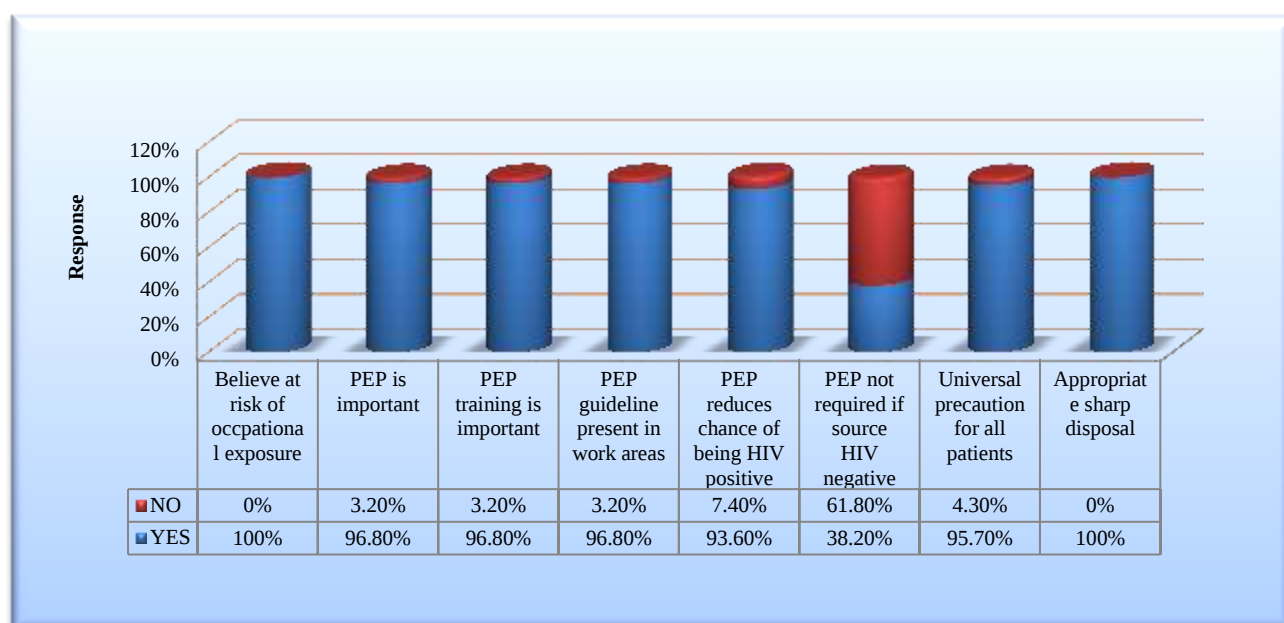


Figure 1: Attitude of interns towards occupational exposure and PEP of HIV.

Practice assessment

Table 2, shows the questions related to practice status of medical interns towards occupational exposure and PEP of HIV. Majority of them 52 (55.3%) take universal precautions before handling any patients, most of the time; followed by 28 (30%) of them occasionally and 14 (15%) of them always. When asked about reason for irregular/ improper use of universal precautions, majority 56(60%) of them opted for busy schedule followed by 50 (53%) of them for unavailability of personal protective equipment's, 14 (15%) for lack of time and 8 (8.5%) of them laziness. Majority of the interns 52 (55.3%) dispose the sharps appropriately most of the time followed by 32 (34%) of them always and 10 (11%) of them occasionally dispose appropriately. When asked about reason for improper disposal of sharps, majority of the interns 53 (56.3%) opted for unavailability of equipment's followed by 47 (50%) of them for busy schedule, 11 (12%) for laziness and 9 (9.6%) for lack of time. 37 (39.3%) of the interns had undergone training on infection control and PEP for HIV.

Figure 2, shows the prevalence of occupational exposure to HIV among medical Interns with type of exposure. Among 94 medical Interns, 16 (17%) of them had occupational exposure. 8 of them had injury from a sharp object, 2 of them had contact with patients body fluids on non-intact skin and 6 of them had mucous membrane contact with infectious fluid. Out of 16 exposed, 5(5.3%) had taken PEP for HIV of which, PEP was initiated

within 2hrs for one person, 2-24hrs for 3 of them and 24-48hrs for the other one. None of them took the complete course. 4 of the interns had taken it for <1week and one person had taken it for <2weeks. Reason for discontinuation of PEP, 4 of them opted for fear of adverse effects and one person opted for assuming that it was enough.

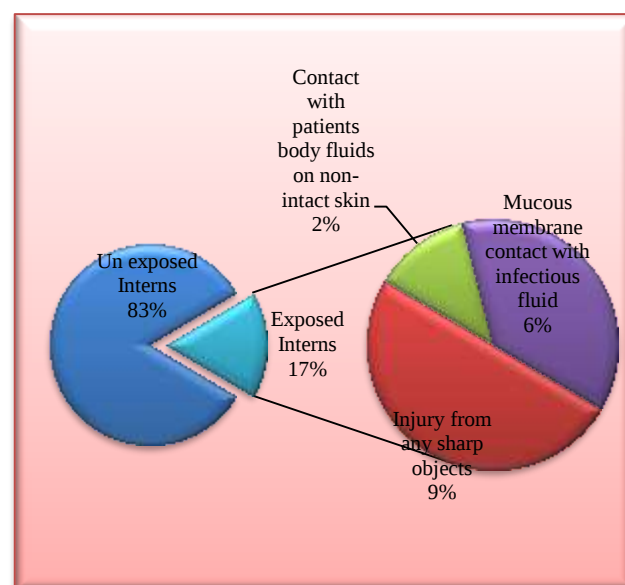


Figure 2: Occupational exposure to HIV among medical Interns with type of exposure.

Table 2: Practice of PEP for HIV among medical interns.

Questions	Responses	Frequency (%)
Do you practice Universal Precautions?	Occasionally	28 (30%)
	Most of the time	52 (55%)
	Always	14 (15%)
Reason for irregular use/ not practicing universal precautions	Lack of time	14 (15%)
	Busy schedule	56 (59%)
	Unavailability of equipment's	50 (53%)
	Laziness	08 (8.5%)
	No response/ Blank	05 (5.3%)
Do you dispose sharps appropriately?	Occasionally	10 (10.6%)
	Most of the time	52 (55%)
	Always	32 (34%)
Reason for irregular/ not disposing sharps appropriately	Lack of time	09 (9.5%)
	Busy schedule	47 (50%)
	Unavailability of equipment's	53 (56%)
	Laziness	11 (11.7%)
	No response/ Blank	09 (9.5%)
Did you undergo any training on infection control and PEP for HIV	Yes	37 (39.3%)
	No	57 (60.6%)
Initiation of PEP among exposed	Within 2hrs	1 (1.06%)
	Within 2-24hrs	3 (3.2%)
	Within 24-48hrs	1 (1.06%)
Exposed Interns who completed the course of PEP for HIV		0
Duration for which PEP was taken	< 1week	4 (4.3%)
	<2 week	1 (1.06%)
Reason for discontinuation of PEP for HIV	Fear of adverse effect	4 (4.3%)
	Assuming that it was enough	1 (1.06%)

DISCUSSION

This study assessed the knowledge, attitude and practice towards PEP for HIV among medical Interns who were directly involved in the care of patients in BIMS Hospital, Belagavi.

The results of our study showed that, 70 (74.4%) of them had correctly identified non-infectious fluid for HIV, 92 (98%) of them had correctly identified personal protective equipment's.

In our study, 65% of the study participants knew that sharps to be disposed in white puncture proof container and recapping of used needles should not be done which was correctly answered by 29%. Whereas in a study by Mukherjee S et al showed that 89.2% of study participants knew appropriate sharp disposal and 83.1% knew that recapping of used needles should not be done which were very high compared to our study.⁹

In the same study by Mukherjee S et al it was shown that 68.5% of study participants correctly knew the time of initiation of PEP for HIV, 69.2% knew PEP regimen correctly which were very high.⁹ Whereas in our study 44% answered correctly the time of initiation and 23% knew correct recent NACO regimen.

In our study, 57% of participants knew complete duration of PEP for HIV is for 4weeks and 96% knew availability of PEP drugs in hospital which was high as compared to the above study wherein 46.9% knew complete duration, and 66.1% knew the availability of PEP drugs in the hospital.

In Another study by Chacko J and Isaac R, showed that 12 (31.6%) knew the ideal time of initiation of PEP, whereas in present study it was high 44%.¹⁰

In our study, 16 (17%) of them had occupational exposure. 8 (9%) of them had injury from a sharp object, 2 (2%) of them had contact with patients body fluids on non-intact skin and 6 (6%) of them had mucous membrane contact with infectious fluid which were very less compared to a study by Singru SA, Banarjee A which showed that the incidence of accidental exposure to potential infectious material among interns was 37.34%, of which 56 (94.2%) exposure was with needle-stick injuries and 3(5.08%) was due to splashing of body fluids/blood.¹¹ Present study results were very less compared to another study by Karstaedt AS and Pantanowitz L, which showed that 69% of interns reported one or more percutaneous exposures to blood during the internship, and 45% recalled a mucocutaneous exposure to HIV-positive blood.¹² In another study by

Gupta A et al, the prevalence of occupational exposure to HIV among Interns was 53.1% which was very high compared to our study.¹³ In another study by Lal P 72.9% of interns had needle pricks and 53.7% had mucous membrane exposure with infectious fluid which were very high compared to our study.¹⁴

In our study among the exposed interns, 11 (11.7%) of them reported to concerned authority and 5 (5.3%) had taken PEP for HIV which was very less compared to a study by Singru SA and Banarjee A which showed, 46 (77.97%) of them reported to concerned authority and 20 (33.90%) of them took PEP for HIV.¹¹ In another study by Sharma R showed that 16.2% of Interns had needle stick injuries and only 6.3% of them had taken PEP for HIV which was almost similar to findings from our study.¹⁵

The present study has its own limitations. The results of this study could not be extrapolated to other groups of healthcare workers because they had not been included in the study. However, this study has to some extent been able to assess the training needs of the interns who are going to be the future consultants. Similar studies on different groups of healthcare workers are needed to determine whether knowledge and practice differ in different groups and the data from such studies will provide an opportunity to test the reliability of the questionnaire used in the present study.

CONCLUSION

To conclude in our study significant proportion of study subjects had less knowledge and practice even though the majority of respondents had good attitude towards PEP. Therefore, a formal training for all Interns regarding PEP for HIV and also establishing a 24 hour accessible PEP Centre with proper guideline is recommended.

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