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A Study to Estimate the Prevalence of Occupational Exposure to Blood and Body Fluids Among the Health Care Workers in a Teaching Hospital Attached to Bangalore Medical College and Research Institute (BMCRI)

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ABSTRACT

Background: Health care workers (HCWs) are at a high risk of sharp injuries and contact with blood and body fluids, exposing them to over 20 different blood borne pathogens, the most common being hepatitis B virus (HBV), hepatitis C virus (HCV) and Human immunodeficiency virus (HIV).This study was carried out to estimate prevalence of accidental exposure to blood & body fluids during preceding 12 months among HCWs in a tertiary hospital in Bangalore.

Methods: A semi-structured questionnaire was used to study 240 HCWs during a 3 months period (September-November) in a teaching hospital in Bangalore.

Results: Occupational exposure to blood & body fluids in the preceding 12 months was reported by 54.5% of the respondents. Needle stick injuries (NSI) was the most common mode of such exposures (87%). Only 40.4% of the affected individuals had reported the incident.

Conclusion: Occupational exposure to blood & body fluids was a common occurrence in study sample. There was gross under-reporting of such incidents leading to a lack of proper post exposure prophylaxis (PEP).

Key words: blood and body fluids, health care workers, occupational exposure, hepatitis B virus, Human immunodeficiency virus

INTRODUCTION

Health care workers (HCWs) are at a high risk of exposure to blood borne infections by pathogens, from sharp injuries and contact with blood and body fluids. The level of risk depends on the number of patients with that infection in the health care facility and the precautions the health care workers adopt while dealing with such patients. These preventable injuries expose workers to over 20 different blood borne pathogens[1], the most common being Hepatitis B virus (HBV), Hepatitis C virus (HBC) and Human immunodeficiency virus (HIV)[2].

According to WHO report 2002, among the 35 million HCWs worldwide, about 3 million receive percutaneous exposure to blood borne pathogens each year. Moreover 40% of HBV& HCV infections and 2.5% of HIV infections in HCWs are attributable to occupational exposures[3].

Unlike developed countries, most developing countries may not have surveillance for occupational exposure to blood and body fluids, which precludes estimation of the exact magnitude of such accidents. Adherence to standard precautions, awareness about post exposure prophylaxis (PEP) is poor in

developing countries among HCWs and documentation of exposure are suboptimal.

The risk of seroconversion to HIV infection following a needle stick injury has been estimated to be 0.3% and 0.09% following a mucosal exposure. PEP has been reported to reduce the risk of seroconversion by 80%[4]. Only HBV vaccination is available, leaving HCWs at significant risk of morbidity & mortality when exposed to HCV & HIV[5].

With India having a high prevalence of HIV patients, the HCWs investigating & managing them are at risk of contracting HIV during the course of their duties. Over the past decades, owing to high incidence of HIV and risk of occupational exposure, a number of strategies have been implemented by our government. In spite of that a significant number of occupational exposures occur among HCWs at government hospitals.

There are only few studies in India documenting the frequency, PEP protocols followed and consequences of needle stick injuries[6,7,8]. The present study was done to estimate prevalence of blood and body fluid exposures during the preceding 12 months among HCWs in a teaching hospital, circumstances leading to such accidents and post-exposure measures taken by the HCWs.

MATERIALS AND METHODS

The study was carried out for a period of 3 months, during September to November 2014 in a tertiary care teaching hospital attached to Bangalore medical college & research institute, after obtaining clearance from the institution ethical committee. Written permission for conducting the study was taken from the hospital administrative authorities.

Based on a previous study by Mehta A et. al.[9] in a tertiary care centre in Mumbai, the sample size was calculated as 240. The HCWs were selected by simple stratified random sampling in the following proportion; Staff nurses-40, Nursing students-60, Laboratory technicians-40, Interns-60, Resident doctors-40. After explaining the purpose of the study, consent for participation was taken from each HCW.

Data was collected using a semi-structured questionnaire. Participants were instructed not to write their names or identify themselves in any way. The HCWs were asked to recall exposure to injury by sharps and blood & body fluids in the preceding 12-month period. They were also queried about the type of accident, circumstances leading to the exposure and the body site of exposure. Information was also elicited on what they did after encountering such exposures regarding local toilet, notification, lab investigation and post-exposure prophylaxis (PEP). Some of the respondents completed the forms right away while some others preferred to complete them during their free time and turned them in after a few days.

Data was entered in Microsoft excel sheet and analyzed using SPSS 21 software. Descriptive statistics such as frequency tables, pie diagrams and bar charts were used to examine the primary objective.

RESULTS

Of the 240 study participants, 131 (54.5%) of them have had at least 1 accidental exposure to sharps or blood & body fluids splash during the last 1 year. Out of these, majority 114 (87%) were exposed to needle stick injury (NSI), which includes only once (98), twice (12) & thrice or more (4). The rest (12.9%) were due to splashing of blood/body fluids**.**

Overall recapping of needles was the most hazardous procedure leading to the exposure (32%). Manipulating needle in patient or iv line, suturing and discarding sharps into container were the other procedures in order of frequency exposing the HCWs to potential infectious material **[Table 1].** Assisting in operation theatre and obstetric delivery were the main causes of splashing of blood/body fluids.

Table 1: Distribution of cases according to procedure during which exposure occurred (n=131)

Procedure wise distribution of exposure	Cases (%)
Manipulating needle in patient or IV line	31 (23.60)
Recapping	42 (32.06)
Suturing	23 (17.50)
Discarding sharp into container	18 (13.70)
Assisting in operation theatre	7 (5.30)
Obstetric delivery	10 (7.60)

Table 2: Distribution of cases according to the site of exposure

Sites of Exposure	Cases (n=131) (%)
Palm	38 (29.01)
Fingers	76 (58.02)
Forearm	3 (2.29)
Face	10 (7.63)
Legs	4 (3.05)

Table 3: Distribution of cases according to the reason for exposure (n=131)

Causes of exposure	Cases (%)
Lack of technical preparation	21 (16.03)
Distraction	37 (28.24)
Tiredness	25 (19.08)
Lack of personnel protective equipment	39 (29.77)
Anxiety	9 (6.8)

Table 4: Reason for non-reporting of exposure

Reasons for Not Reporting	Cases (n=78) (%)
No time to report	21 (26.9)
Not so important to report	14 (10.68)
Don't know reporting procedure	26 (33.33)
Confidentiality	10 (7.63)
May be blamed	7 (5.3)

The most common site of exposure was the fingers (58%) followed by palms (29%). Other less frequent sites include face, forearm and legs **[Table 2].** Majority of the respondents have observed the desirable practice of washing the exposure site with soap and water (82%). Nearly three-fourth 96 (73.2%) of the exposure were percutaneous with remaining being mucosal exposures. Out of those who had percutaneous exposure, only 18 of them have said blood was visible on instrument before exposure and in most of the cases, skin was intact after the exposure.

When asked about what do they think was the reason for the accidental exposure, nearly 30% of the participants opted for lack of personnel protective equipment (PPE), followed by distraction (28%). Lack of technical preparation, tiredness & anxiety were the other reasons in the order of frequency**[Table 3].**Of the total participants,183 (76.2%) said they recap used needles and to the question of how often they use PPE,152 (63.3%) of them said occasionally,67 (27.9%) never & only 21 (8.7%) said always.

Only 53 (40.4%) of the HCWs who had been exposed reported the incident and the reasons given by the remaining (78) for not reporting varied from no time to report, did not think it's important to report, did not know the reporting procedure to fear of confidentiality or being blamed **[Table 4].** Among those who reported the accidental exposure, nearly one-third of them did not seek medical advice from a specialist.

The source patient was identified in three-fourth of the exposure cases 99 (75.5%) & the exposure status was found to be positive for 34 among them. Of the 34 exposures, 26 patients (76.4%) were HIV positive and 8 (23.5%) were positive for HBV antibodies. No source patient was positive for HCV. All the HCWs had been vaccinated for HBV and prophylaxis against HBV was not necessary. Despite 26 patients being confirmed as HIV positive, the 28 days mandatory post-exposure prophylaxis was completed only in 19 of the 26 exposures reported. The main reason given for non-compliance was intolerance to the side effects of the medication.

DISCUSSION

Infections due to blood borne pathogens can be greatly reduced by strictly practicing infection control guidelines. These include hand washing, use of Pre-training of HCWs having a check on proper disposal of waste and good surveillance system on hospital acquired infections. Universal precautions (U.P.) means that body fluids of all patients should be treated as infectious. Moreover, many studies have shown that risk assessment may not be possible in patients with massive bleeding, severe trauma emergencies presenting to casualty[10]. Hence it becomes important to practice standard precautions at all times for all patients.

In our present study, majority of accidental exposure to blood & body fluids was due to needle stick injuries and most of them were percutaneous. In developing countries, where the prevalence of HIV infected patients is high the number of NSI is also high[11]. Unreported needle stick & sharp injuries are a serious problem and prevent injures HCWs from receiving PEP against HIV infection. According to researchers, 40-70% of all NSI are unreported[12]. The percentage of persons who did not report the incidence of exposure was found to be 60% in our study. Under-reporting of cases is reported in many other studies[13,14,15,16], which has been observed in our study too.

Once injured, many respondents did not know whom to contact. This is similar to findings from other studies in India[8,9,13,14]It is important to find out why nearly 33% among the exposed did not know the reporting procedure. Also 26.9% of them mentioned that they did not have time to report. It is important to have a simple reporting format so as to not add to their burden in terms of time constraints.

Although half of the respondents believed that needle injuries are part of their job, almost most them believed that they are avoidable. It was encouraging to note that all the HCWs who had been exposed had already been immunized against hepatitis B. The present study reiterates the results of various other studies done among HCWs[7,8,9,13,14], namely; that NSI are a common occurrence among HCWs & they are grossly under-reported; and knowledge about NSI & possible infection from blood-borne pathogen is often low and risks under-estimated.

CONCLUSION

Incidence of occupational exposure is inversely related to training. Hospitals should therefore focus on policies for reducing transmission and should create awareness among both staff and students about safety precautions by conducting seminars, sessions & training programs from time to time.

Limitations:

This study was carried out at only 1 hospital; the study population was small. Also, the incidence of exposure to NSI and blood & body fluids in the present study was measured by self-reporting on the part of the HCW. This may have led to inaccuracies due to recall bias. However, an NSI/splash is a significant event, and one that it is unlikely an HCW would forget.

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