## **Original Research Article**

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# A study on knowledge, attitude, practice and prevalence of needle stick injuries among health care workers in a tertiary care hospital of Assam

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#### **ABSTRACT**

**Background:** The objective of study was to determine prevalence of needle stick injuries among health care workers in a tertiary care hospital of Assam and to assess the knowledge, attitude and practices on needle stick injuries among them.

**Methods:** It was a cross-sectional study conducted from June 2016 to August 2016 amongst health care workers of a tertiary care centre of Assam. Sample size was calculated to be 90. A total of 10 departments were selected purposively based on their magnitude of risk exposure and the required sample size was allocated proportionally among these 10 departments. The required numbers of health workers from each of the ten departments were selected by using simple random sampling. A predesigned and pretested proforma was used to collect the data. Data were presented in terms of percentages and significance was tested using chi-square and Fisher's exact test.

**Results:** Prevalence of needle stick injury among the health workers was found to be 21.1%. Regarding spread of diseases after an accidental needle stick injury, 100% were aware of HIV, 98.9% were aware of Hepatitis B and 67.8% were aware of Hepatitis C. Regarding their attitude to report to in-charge medical officer, only 21.1% had reported about their injury. Around 58.9% of health care workers used gloves regularly for prevention of such injuries. Practice of recapping among the health care workers was 66.7% and out of total needle stick injuries, recapping contributed to 26.3%. While considering sharp waste disposal, 37.8% health care workers did not follow proper waste disposal guidelines. Only 26.3% of health care workers had done screening for HIV/AIDS and Hepatitis B after their injury.

**Conclusions:** There is a need to have a pre-employment training to improve the knowledge, attitude and practice regarding accidental needle stick injuries among the health care workers.

Keywords: Health care workers, Needle stick injury, Knowledge, Attitude, Practice

### INTRODUCTION

Needle stick injuries are accidents commonly encountered by health care workers which expose them to various blood borne pathogens and related hazards. There are about 20 different blood borne pathogens that are transmitted through needle stick injuries and the most common are Hepatitis B, Hepatitis C and HIV. A WHO study reported the annual estimated proportions of health-care workers (HCW) exposed to blood-borne pathogens

worldwide were 2.6% for Hepatitis C virus, 5.9% for Hepatitis B virus, and 0.5% for HIV, resulting in about 16,000 Hepatitis C virus infections and 66,000 Hepatitis B virus infections in HCW globally.<sup>3</sup>

Needle stick injuries usually go unreported, so low reporting rate should not be confused with low injury rate. Usually there is an under estimation of the true injury rate recorded by standard occupational system, as much as 10-fold.<sup>4</sup> The use of universal precautions such as appropriate hand washing and barrier precautions,

reduces contact with blood and body fluids.<sup>5-8</sup> In spite of following the standard precautions and introduction of new techniques and devices, needle stick injuries continue to occur; which in turn pose a threat to health care workers against blood borne infections.<sup>9</sup>

The present study was carried out to determine prevalence of needle stick injuries, to assess the knowledge, attitude and practices on needle stick injuries during the preceding one month among health care workers in a tertiary care hospital, circumstances leading to such accidents and post-exposure actions taken by the health care workers.

#### **METHODS**

It was a cross-sectional study conducted from June 2016 to August 2016 amongst the health care workers of a tertiary care centre of Assam. The study population included post graduate students, interns, nursing staff and laboratory technicians working in the various departments of a large tertiary care hospital in Assam. Advance permission was taken for carrying out the above study. Considering the prevalence of needle stick injury to be 34.8%; sample size was calculated to be 90. 10 A total of 10 departments were selected purposively based on their magnitude of risk exposure and the required sample size was allocated proportionally among these 10 departments. The required numbers of health workers from each of the ten departments were selected by using simple random sampling. A predesigned and pretested proforma was used to collect the data. Before conducting the interview, an informed consent was taken from each of the health care worker. The respondents were told about the purpose of the research and that anonymity would be maintained in their responses. The criteria for inclusion were health care workers, both male and female who deal with needles frequently i.e. post graduate students, interns, nursing staff and laboratory technicians. Professors, specialists, consultants and health care workers of the departments, who do not use needles frequently, were excluded from the study. Health care workers who did not give consent were also excluded from the study. Working definition of needle stick injury - "any cut or prick to the respondents by a needle which was earlier used on a patient, sustained during duty hours and within the premises of the workplace". Data thus collected were presented in terms of percentages and significance was tested using chi-square test and Fisher's exact test.

#### RESULTS

The respondents included 90 health care workers of the hospital, consisting of 25 post-graduate students, 23 interns, 34 nursing staff and 8 laboratory technicians. The respondents were asked about needle stick injuries during the last month of work. Nineteen (21.1%) of the respondents reported having encountered an accidental needle stick injury within the last month. Needle stick injury within last one month was reported maximum among interns (34.8%) followed by post graduate students (24.0%) and nursing staff (14.7%) in Table 1.

Convincing proportions of the health care workers 100%, 98.9% & 67.8% knew HIV/AIDS, Hepatitis B virus and Hepatitis C virus respectively as common diseases associated with needle stick injury (Table 2). Some of the health care workers had the misconception about tetanus and Hepatitis A being transmitted by needle stick injury.

Table 1: Responses of the various categories of the health care workers to different questions regarding their needle stick injury.

	PGT	Intern	Staff nurse	Lab. Tech	P value
Proportion who had a NSI in the last 1 month	6 (24.0%)	8 (34.8%)	5 (14.7%)	0 (0%)	0.13
Proportion who used gloves regularly	11 (44%)	8 (34.7%)	28 (82.4%)	8 (100%)	0.002
Proportion who reported their NSI to the medical officer in charge	1 (16.7%)	3 (37.5%)	0 (0%)	0 (0%)	0.18
Proportion who had done screening test	0 (0%)	5 (62.5)	1 (20%)	0 (0%)	0.08

Table 2: Knowledge of health care workers about the type of diseases transmitted.

Type of Diseases	Number of Participants having the knowledge (%)
HIV/AIDS	90 (100%)
Hepatitis B	89 (98.9%)
Hepatitis C	61 (67.8%)
Hepatitis A	12 (13.3%)
Tetanus	14 (15.6%)

The various circumstances involved at their workplace which might have been a causative agent for needle stick injury are shown in Table 3.

Majority of the respondents 91.1% agreed that they administer injection to patients but only 62.2% of them disposed used needles as per the waste disposal

guidelines. It was seen that the rate of needle stick injury decreased with increase in work experience except for one accidental injury that had occurred in a health care worker with a work experience of 11 to 15 years. It was seen that overwork on duty was a significant factor that was associated with the needle stick injuries encountered by the health care workers (p= 0.02). Of the total 19 health care workers who experienced a recent needle stick injury, 17 (89.5%) were overwork on duty during their injury (Table 4).

Recapping (26.3%) and suturing (26.3%) were reported to be most common causes of injury (Table 5).

Around 61.1% of health care workers used gloves regularly for prevention of injuries. It was also seen that

in spite of wearing gloves regularly, needle stick injuries continued to occur. Out of the participants who did not wear gloves on a regular basis, majority (51.4%) stated that sometimes patients were so serious that wearing gloves might delay the service (Table 6).

Regarding the attitude of the health care workers who was exposed to injury, only 21.1% had reported about their injury to the medical officer in charge. 37.5% and 16.7% of interns and post graduate trainees respectively reported about their injury to their in charge. It was seen that none of the nursing staff had reported about their injury (Table 1).

The respondents were asked about their immediate action following a needle stick injury (Table 7).

	<b>Table 3: Circumstances</b>	of health care	workers involved	l at workplace.
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Circumstances involved at workplace	Number of participants involved
Administer injection to patient	82 (91.1%)
Draw blood sample	78 (86.7%)
Set I.V fluid and blood transfusion	80 (88.9%)
Suturing	45 (50%)
Handle/ clean sharps	31 (34.4%)
Collect hospital linens	20 (22.2%)
Recap used needles	60 (66.7%)

Table 4: Association of needle stick injury with work experience of participants and overwork on duty.

Variables	Total numbers of participants	Participants exposed to needle stick injury	p- value
Work experience	e (in years)		
< 1	33	10 (30.3%)	
1-5	38	8 (21.1%)	
6-10	8	0 (0%)	0.22
11-15	4	1 (25%)	
> 15	7	0 (0%)	
Overwork on du	ıty		
Yes	61	17 (27.9%)	0.02
No	29	2 (6.8%)	0.02

Table 5: Distribution of the various causes of needle stick injury.

Causes of the injury	Number of participants exposed to NSI
During suturing	5 (26.3%)
Recapping a needle	5 (26.3%)
Giving injection	4 (21.1%)
Drawing blood	3 (15.7%)
Carelessly handing a needle	2 (10.5%)

Table 6: Reasons of not wearing gloves regularly.

Reasons of not wearing gloves regularly	Number	0/0
Non availability of gloves	12	34.3
Time consuming	5	14.3
Patients are so serious, wearing gloves might delay the service	18	51.4
Total	35	100

Table 7: Distribution of the immediate actions taken after recent needle stick injury.

Action	Number (n=19)		
	Yes	%	
Expresses blood, cleans with soap water and spirit	3	15.7	
Express blood and cleans with soap water	2	10.5	
Expresses blood and cleans with spirit	3	15.7	
Cleans with soap water and spirit	7	36.8	
Cleans with soap water only	3	15.7	
Cleans with spirit only	1	5.3	

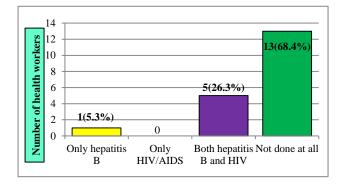


Figure 1: Diagram showing screening test done by health workers.

Of the health care workers who received an injury, 9 were aware of the patient's HIV status and 10 of them were aware of the patient's Hepatitis B status. But 5 i.e. 26.3% of health care workers had done screening for both HIV/AIDS and Hepatitis B after their injury and only 1 health care worker screened for hepatitis B alone in Figure 1.

#### **DISCUSSION**

In the present study, prevalence of needle stick injuries in the preceding one month was 21.1%, ranging from the lowest incidence of 0% among the laboratory technicians to 34.8% among the interns. A study done in a tertiary care hospital in Delhi by Sharma et al reported the prevalence of needle stick in one month to be 22.4% which is in accordance with the present study. Interns had a higher incidence of exposure as compared to other health care staff which might have been due to their lack of experience in practical procedures. Clarke et al in their study found that the possibility of a needle-stick injury had an inverse relation to years of experience. 12

Needle stick injuries if go unreported become a grave problem as the injured health care workers are deprived from receiving timely post exposure prophylaxis against HIV and Hepatitis B. If post exposure prophylaxis for HIV is received on time, it is found to be 80% effective. <sup>13</sup> According to Osborn, Papadakis and Gerberding, 40%-70% of all needle-stick injuries are not reported. <sup>13,14</sup> The present study also shows that only 21.1% had reported about their injury to their respective in charge while 78.9% of the cases had gone unreported. Clarke et al in

their study, found that exposed respondents who had reported their injury was only 29%. 12

Although the USA Occupational Safety and Health Administration's (OSHA) blood borne pathogen standards has prohibited unsafe injection practices like recapping needles, recapping is still a common practice and is reported to be tremendously high in many studies. 15,16 In the present study, practice of recapping among the health care workers was 66.7% and out of total needle stick injuries, recapping contributed to 26.3%. Various studies have shown recapping to be an important cause of needle stick injury. Periodic training programmes and display of IEC material about no recapping should be encouraged at workplace premises in order to ensure safety among the hospital care staff. Among the participants who were exposed to needle stick injury, 89.5% had reported overwork on duty. Extensive working hours have been found to be an important risk factor for needle stick injuries. 21,22

#### **CONCLUSION**

Needle stick injuries signify an important occupational hazard to people working in a hospital. A uniform needle stick injuries policy covering safe work practices, safe disposal of sharps, procedures in event of needle stick injury, training including pre-employment training, monitoring, evaluation of needle stick injuries, procedures for reporting needle stick injuries and a proper surveillance mechanism should be there in every hospital to reduce the occurrence of such injuries.

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Institutional Ethics Committee

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