Knowledge and Awareness on Needle Stick Injury among Interns: It's Time to Act

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Abstract:

Background: An accidental needle stick injury is the commonest occupational hazards occurring among health care workers and contributes to greater risk of transmission of blood borne infections. Interns being vulnerable section of health care providers are more prone for these deadly infections. In this regard the present study was designed to examine the knowledge, awareness and attitudes towards needle stick injury (NSI) among interns

Method: A cross sectional survey was conducted among interns. A structured self-administered questionnaire was used as tool to assess knowledge, practice and attitude variables of NSI among interns. The data was expressed as frequency and percentage

Results: Out of 105 interns approached, 78 submitted the filled questionnaire with a response rate of (74.28%). Majority of the participants had knowledge on exposure risk of NSI (70.83%), regime of hepatitis vaccination schedule (75%) and universal precaution (90.28%). Interns were also aware of the fact that Hepatitis B is having greater risk of transmission (95.83%). Reading books (50%) was the highest scored source of information on universal precaution. More than 50% of participants were unaware of NSI recommendation of Centre for Disease Control (CDC). Only 1/3rd of the participants knew the proper color coding for sharp waste collection with only 6.94% giving correct response to disposal of sharp wastes.

Conclusion: Majority of the interns had adequate knowledge and awareness on needle stick injury and universal precautions to be taken during NSI. However, the knowledge on NSI recommendations of CDC, sharp waste handling and biomedical disposal was not optimum. It's time to act and incorporate safe practices, biomedical waste management, prevention and management of NSI into medical curriculum as a continuous process from phase II onwards by orientation programs and workshops.

Key Words: Hepatitis B, Interns, Needle Stick Injury, Universal Precautions,

Introduction:

Needle Stick Injuries (NSI) are defined as injuries caused by needles such as hypodermic needle, blood collection needles, intravenous stylets and needles used to connect parts of intravenous delivery systems.[1] It also includes injuries caused by suture needles or hollow bore needles. Any cut or prick to the health care worker (HCW) by a needle precisely used on a patient, is work related and sustained within hospital premises constitutes NSI.[2]

The major activities that result in NSI occurs during administration of injection to the patients,

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collection of blood sample for investigations, recapping of needles, disposal of needles, handling of trash and dirty linen (downstream injuries), transferring of blood from syringe to container like vacuum tube etc.[3]

Accidental NSI are commonest occupational hazards occurring among health care workers. High risk exposures are seen in Health care workers (HCW) working in areas of operation, delivery, emergency department and laboratories.[4] The prevalence of NSI among HCW has been diversely reported in different studies. The CDC estimates 385000 NSI among HCW globally per annum. The incidence of sharp injuries given as mean number of sharp injuries/HCW/year is 2.27 for South Asian D region (India, Bangladesh, Myanamar etc), 0.18 for America A (Canada, USA etc) and 4.68 for Eastern Mediterranean D regions (Pakistan, Somalia, Sudan etc).[5] In developing countries the risk of occupational exposure is high, but about 40-75% of the NSI goes unreported.[6]

More than 20 blood borne pathogens can be transmitted through NSI especially Hepatitis B, Hepatitis C and HIV infections.[7] After NSI, the risk of infection is 0.2-0.5%, 40% and 3-10% for HIV, Hepatitis B and hepatitis C respectively.[6] NSI not only leads to these high morbidity and mortality diseases but also can cause depilating psychiatric illness and further poses economic burden to the society.[8]

The NSI and the consequent occupational hazards can be prevented with strict implementation of universal precautions, immunization with hepatitis B vaccine, provision of personal protective measures and prompt management of exposures including post exposure prophylaxis (PEP) and post exposure actions. Every health sector should implement these strategies with effective infection control committee with support from health setting management team.[4]

Interns are particularly vulnerable section constituting high risk group. Many studies have shown interns having high rates of occupational exposures [9] and high incidence of percutaneous injury.[10] Interns because of their inexperience, long working hours, high volume of inpatient procedure etc., are prone to increased NSI. Further ignorance or temptations to ignore the universal precautions increases the risk of percutaneous injuries and exposures among this group of HCW.[10] Hence this study was undertaken to assess the knowledge and awareness regarding NSI and universal precaution among interns.

Material and Methods:

A cross-sectional questionnaire based study for two months' duration was conducted among interns of tertiary care teaching hospital. A structured questionnaire was used as a tool to assess knowledge, practice and attitude variables of NSI among interns. The questionnaire had sections for obtaining demographic data and statements to elicit the knowledge on universal precautions, NSI, Hepatitis B vaccination & disposal of waste sharps. Questionnaire also had statements pertaining to attitude of interns towards NSI precautions. The questionnaire was validated by expert peer review. After obtaining institutional ethical clearance all interns (n=105) were approached and explained the purpose of the study and maintenance of anonymity and confidentiality. Out of 105, 82 interns gave consent and were included in the study. Interns not willing to participate and on leave on the day of administration of questionnaire were excluded from the study. Majority of the interns returned the filled questionnaire immediately and maximum time allowed to return the filled questionnaire was 24 hours.

Statistical analysis: All the data was coded and entered in excel sheet. The results were tabulated and expressed as frequency and percentage.

Results

Eighty-two interns consented to be part of the study and 78 interns returned the filled questionnaire. Of this 6 questionnaires were critically incomplete, hence not included for analysis. Finally,72 completed questionnaires were included for analysis. The mean age of the study population was 23.67 ± 1.14 with females constituting 56.94% and males as 43.05%. (Table 1)

As shown in table 2, majority of interns had knowledge of the exposure risks for pathogens following NSI and were aware of having greatest risk of transmission being hepatitis B (95.83%)which can be prevented by Hepatitis

vaccination (81.94%). More than 50% of participants were unaware of post NSI recommendation of Centre for Disease Control (CDC) regarding practice to milk out more blood.

As shown in table 3, majority of interns had knowledge of universal precautions (90.28%) and were aware that NSI can be prevented by adhering to universal precautions. Reading text books (50%) constituted the major source of information on universal precautions (Table 4)

75% of respondents had the correct knowledge of regime of hepatitis vaccination schedule. 33.33% were aware of correct container for sharp waste collection with only 6.94% giving correct response to disposal of sharp wastes. (Table 5)

Table 6 shows the attitudes of interns towards NSI. Almost all interns (98.61%) agreed on the importance of undergoing training for all health workers in universal precautions, waste management and infection control. More than 50% felt needles should be recapped after its use and a small percentage felt wearing gloves is not necessary (19.44%) and reporting of NSI is not much use (15.28%). Around 20% of intern perceived; if health workers get infected with HIV injection, they should resign from the job.

Discussion

NSI is one of the most common occupational hazards faced by the health care providers (HCPs), which results in exposure to a large number of blood borne pathogen mainly Hepatitis B virus (HBV), Hepatitis C virus (HCV) and Human Immunodeficiency Virus (HIV). "Most blood exposures in health settings are preventable. Strategies to protect health workers include implementation of Universal Precautions, immunization against hepatitis B, provision of personal protection and the management of exposure".[4]

According to the CDC report, use of safety engineered devices will reduce NSI by 76%.[11] The present study was conducted to assess the knowledge and awareness/attitudes of interns. In the present study, majority of interns were aware of universal precautions (90.28%) and NSI can be prevented by taking universal precautions (88.89%). The knowledge of universal precautions was majorly obtained by reading textbooks and from classroom teaching. This is similar to a study by Norsayani et al, where it was reported that medical students had acquired the knowledge of blood borne diseases through lectures (98.3%), books (90.8%) and informally (81.6%).[12]

In the present study 70.83% of respondents were aware of blood borne infections through NSI and 95.83% gave the correct response of hepatitis B carrying highest risk of transmission which can be prevented by Hepatitis B immunization (81.95%) and 75% of participants were aware of correct regime of hepatitis immunization. A study done on dental students also reported similar knowledge with 74% of the students being aware of transmission of blood borne diseases through NSI, 94% of the students felt hepatitis B carries highest risk of transmission and 91% of students felt hepatitis B vaccine prevents HBV infection.[13]

As per the National Institute for Occupational Safety and Health (NIOSH) guidelines, to prevent NSI and its related risks it is cardinal to avoid recapping of needles, dispose the needle sharps appropriately and report the NSI to the authorities.[14] In the present study as many as 59.72% felt that recapping of needle is necessary. It was alarming to note lack of knowledge of interns in biomedical waste management of waste sharps both for container for collection (33.33%) and its correct disposal (6.94%). In the present study, 19.44% perceived that wearing gloves is not always necessary.

A study by Swe KMM et al, reported a higher percentage of students agree/strongly agree that reporting after NSI is not much useful (81.1%).[7] However in the present study only 15.28% felt that reporting is not of much use. Also in the same study 47% of medical students also agree/strongly agree to a statement that "health care workers infected with HIV, should resign from their profession".[7] In contrast to this in the present study only 19.44% agreed to the above statement.

A majority of interns (98.61%) felt that all health workers should undergo training on universal precautions, waste management and infection control which is encouraging.

The limitations in the present study are low sample size, all interns were not having same duration of internship as the interns were

heterogeneous group of two batches passed out at different periods of examinations and the questionnaire is self-administered with 24 hours maximum time allowed to fill the questionnaire which may have led to influenced answers.

Conclusion:

The present study showed an adequate knowledge and awareness with respect to NSI and universal precaution among interns. On the other hand, knowledge and awareness pertaining to sharp waste handling and disposal methods was not optimum. Hence it calls for an urgent need to incorporate safe practices, biomedical waste management and prevention and management of NSI into medical curriculum. Also recommend to have a good reporting system in place for reporting of NSI and follow up of the injured individuals.

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Table 1: Demographic profile of the study participants

Intern	Number	%	Mean age (yr) ± SD
Male	31	43.1	24 ± 1.21
Female	41	56.9	23.41± 1.02
Total	**72**	**100**	**23.67 ± 1.14**

Table 2: Interns knowledge and awareness of Needle stick injuries

Knowledge and awareness of Needle stick Injuries	True (n)	%	False (n)	%	Don't Know (n)	%
More than 20 different pathogens have been transmitted by NSI	51	70.83	0	0.00	21	29.17
After NSI the practice to milk out more blood is not recommended by Centre for Disease Control	31	43.06	4	5.56	37	51.39
NSI may lead to significant anxiety for the affected person	63	87.50	3	4.17	6	8.33
Hepatitis B carrier has the greatest risk of transmission	69	95.83	2	2.78	1	1.39
Hepatitis B vaccination prevents HBV infection	59	81.94	3	4.17	10	13.89
Currently no vaccine exists to prevent Hepatitis C Infection	51	70.83	6	8.33	15	20.83
Post exposure Prophylaxes should be initiated within 1 hour of the injury	43	59.72	17	23.61	12	16.67

Table 3: Knowledge of interns on Universal precautions

Knowledge on Universal precautions	**Yes N(%)**	**No N(%)**	**Don't Know N(%)**
Are you aware of the universal precautions of NSI?	65(90.28)	7(9.72)	-
NSI can be prevented by taking universal precautions?	64(88.89)	3(4.17)	5(6.94)

Table 4: Sources of information about universal precautions

Sources of information about universal precautions?	Frequency (N)	%
Orientation Program	20	27.78
Class room/ Bedside teaching	23	31.94
Learnt from seniors	21	29.17
Read from text books	36	50.00
e- sources	15	20.83

Table 5: Awareness of Hepatitis B vaccination and sharp waste disposal among interns

Awareness of Hepatitis B vaccination and sharp waste disposal	Correct response (n)	%
What is the regime of taking Hepatitis B vaccination?	54	75.00
Among HBV, HCV, HIV, Which carries highest risk for transmission?	60	83.33
What container should be used to collect sharps waste	24	33.33
How sharp wastes are disposed?	5	6.94

Table 6: Attitudes of interns towards NSI

Attitudes of students	Yes (n)	%	No (n)	%
It is important for all health workers to undergo training programs on universal precautions, waste management and infection control	71	98.61	1	1.39
Needles should be recapped after use	43	59.72	29	40.28
Wearing gloves is not always necessary	14	19.44	58	80.56
Reporting of NSI is not of much use	11	15.28	61	84.72
If health workers get infected with HIV injection, they should resign from the job	14	19.44	58	80.56

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