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ASSESSING THE PREVALENCE OF NEEDLE STICK INJURIES (NSI) AMONG MEDICAL INTERNS & THE DETERMINANTS OF NON-COMPLIANCE TO UNIVERSAL SAFETY PRECAUTIONS.

Community Medicine

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ABSTRACT

Intern Doctors are potentially exposed to blood and body fluids (BBF) in the course of their work and therefore are at risk of infection with blood-borne pathogen. This article accesses prevalence of NSI and sharp injuries and compliance regarding universal safety precaution, barriers and difficulties faced. A hospital based cross-sectional Observational study carried out in Tertiary care hospital in Mumbai among 120 intern doctors posted in various ward over 2 months after ethics committee approval. Self-administrated Interview schedule was used for data collection. Overall Incidence of NSI was 23.3% (28). Most proportion being in "medicine and allied departments" (60.7%). Among cases reported, 92.9% took PEP treatment. The risk gradation was Fatigue (75%), Open bore needle use (64.3%), drawing blood sample (53%) and Needle recapping (19.3%). Strengthening the surveillance and compliance of guidelines will result in risk reduction.

KEYWORDS

Needle Stick Injury (NSI), Universal safety precaution, Intern doctors,.

Introduction:

Considering the environment in which they work, many health care workers are at an increased risk of accidental needle stick injuries (NSI). As a result, these workers are at risk of occupational acquisition of blood borne pathogens such as HIV, hepatitis B and C, and other diseases. The average risk of transmission of HIV to a health care worker after percutaneous exposure to HIV-infected blood has been estimated as 3 in 1000. [1,2] According to a WHO study, the annual estimated proportions of health-care workers (HCW) exposed to blood-borne pathogens globally were 2.6% for HCV, 5.9% for HBV, and 0.5% for HIV, corresponding to about 16,000 HCV infections and 66,000 HBV infections in HCW worldwide.[3]

These figures suggest that a sizable number of individuals are at a potential risk for transmission of blood-borne diseases to doctors, laboratory technicians, blood bank workers, and nurses, personnel working in renal dialysis and transplant units, and other health care workers. Considering the seriousness of the issue and as very few studies done previously our study was aimed at finding the prevalence of needle stick injuries among intern doctors and suggest steps for risk reduction.

Objectives:

1. To study the prevalence of NSI and sharp injuries among interns.
2. To study compliance regarding universal safety precaution among interns
3. To study Barriers and difficulties faced pertaining to reporting and post exposure care.

Material and Methods:

A hospital based cross-sectional observational study carried out in Tertiary care hospital in Mumbai among 120 intern doctors posted in various ward designated as medical and surgical department over 2 months after ethics committee approval. Medical department included Medicine, Paediatrics, Community Medicine, Psychiatry, Dermatology whereas surgical department involves surgery, obstetrics and gynaecology, Orthopaedics, Ophthalmology. Self-administrated Interview schedule was used for data collection.

Needle stick injury was defined as "any cut or prick to the respondents by a needle previously used on a patient is work related and sustained within the hospital premises." Data thus collected were entered into excel spreadsheet for analysis. The statistical tests applied included Chi-square tests for significance of associations and data was summarized using proportions, percentages & contingency tables.

Results:

A) Universal Precaution guidelines Practised (N=120)

Table 1: Distribution of Interns according to Practise of Following Universal Precautions

Guidelines	Practised	Not Practised
Washed hands after contact with blood and body fluids	108 (90%)	12 (10%)
Follow no needle recapping procedure	98 (81.7%)	22 (18.3%)
Wear apron	102 (85%)	18 (15%)
Use gloves	968 (80%)	24 (20%)
Wash hands if contracting different patients	85 (70.8%)	35 (29.2%)
Wash hands before and after touching patients	82 (68.3%)	38 (31.7%)

Above table shows that most intern follows universal safety practises particularly of washing hands on contact with blood and body fluids(108), no needle recapping (98), whereas practice of washing hand before and after touching patients was least followed (82).

Figure 1: Distribution of participants according to Universal precaution guidelines practice

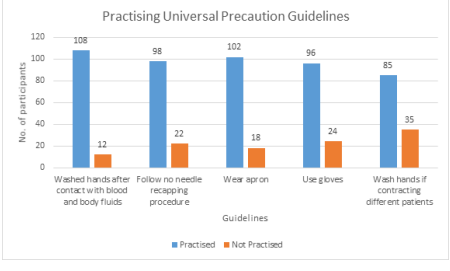


Table 2: Distribution of participants according to sex and department with respect to needle stick injury (NSI).

Parameters	Needle stick injury (NSI)				
	Yes	Percent	No	Percent	
Sex	Male	22	30.6%	50	69.4%
	Female	6	12.5%	42	87.5%
	X= 5.248 Pvalue=0.022				
Departments	Medical	17	28.3%	43	71.7%
	Surgical	11	18.3%	49	81.7%
	X=1.677 P value=0.195				
	Total	28	23.3%	92	76.7%

Out of 120 participants, 28(23.3%) had needle stick injury. The proportion of male interns 22(30.6%) was higher as compared to

female interns 6(12.5%) which was found statistically significant. On the other hand, there was no significant difference in department wise distribution of needle stick injury, 17(28.3%) in medical and allied department whereas 11(18.3%) in surgical and allied department.

Figure 2: Distribution of participants according to sex and department with respect to NSI.

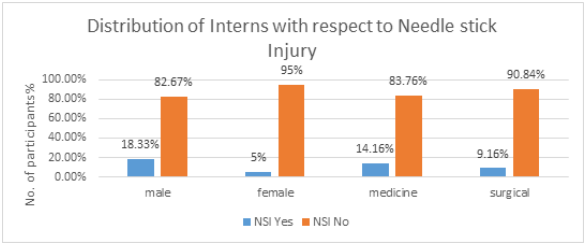


Table 3: Distribution of Interns according Factors associated with needle stick injury (NSI) (N=28)

Reported Incidence	yes	28 (100%)
	No	0
Post exposure prophylaxis	Yes	26 92.85%)
	No	2 (7.15%)
Type of needle	Open bore	18 (64.3%)
	Close bore	10 (35.7%)
Type of procedure	Drawing Blood sample	15(53.6%)
	Needle recapping	7(25%)
	Giving IM injection	3 (10.7%)
	Giving IV injection	3 (10.7%)
Causes of NSI	Uncooperative patient	2(7%)
	Rush	4(14%)
	Fatigue	21(75%)
	Lack of practice	1(4%)
Site	hands	20(71.4%)
	Legs	3(10.7%)
	Face	3(10.7%)
	Other body parts	2(7.1%)
Immediate response after NSI	Wash with Water	6 (21.42%)
	Wash with soap and water	12 (42.85%)
	Done patients' blood investigations	10 (35.71%)

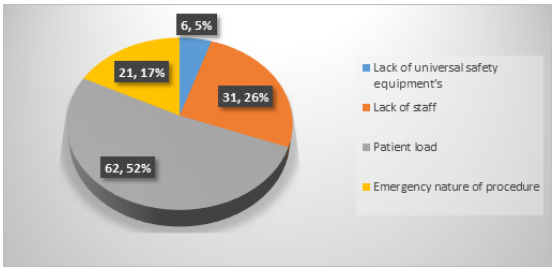
Out of 28 Interns with needle stick injury, all reported the incidence to concerned authority. 26(92.7%) took Post exposure prophylaxis. Hollow (open) bore needle was mainly associated with NSI (64.3%) mostly during blood sampling (53.6%) and 21(75%) described Fatigue as main cause for needle stick injury with hands (71.4%) as most common site.

Table 4: Barriers responsible for Non-compliance to Universal safety precautions (N=120)

Factors	Number of interns	Percent
Lack of universal safety equipment's	6	5%
Lack of staff	31	26%
Patient load	62	52%
Emergency nature of procedure	21	17%

Out of 120 Interns, 62 (52%) interns told that Patient load is main reason for noncompliance to Universal safety precautions whereas lack of safety equipment's availability as barrier was considered by only 6(5%) interns.

Figure 3: Barriers for Noncompliance to Universal safety precautions (N=120)



Discussion:

NSIs pose a significant occupational risk for health-care providers and it is indeed the most important occupational injuries for doctors. Out of total 120 Interns assessed, overall prevalence of needle stick injury was 23.3%.There was significant difference ($p<0.05$) in Sex-wise NSI distribution where male interns 22(30.6%) had higher incidence as compared to female interns 6(12.5%). A study done by Liashram J et al. [4] found 28% of the nurse had at least one needle stick injury during the last 1 year but higher incidence among females as they are predominant in nursing care. No statistically significant difference was found in department wise incidence of NSI.

In our study, the findings regarding reporting of incidence and timely treatment intervention with Post exposure Prophylaxis were outstanding. All interns reported incidence to concerned authority and 98.9% were started with Post exposure prophylaxis (PEP) which can be attributed to fact that interns were more aware about the reporting and consequences of not starting PEP early. However, study done by Salekar S et al.[5] showed that only 3% (6/200) health care workers with needle stick injuries had taken post exposure prophylaxis for HIV infection and 32% reported the injury to the concerned superior. According to interns, Continuous working in wards leading to fatigue (75%) was main reason for NSI.

Hollow bore needle was responsible for 64.3% and drawing blood sample (53.6%) was main procedure for NSI as Hand (71.4%) was most common site followed by legs and face. Similar findings were found in study done by Selakar et al. [5], Russi *et al*. [6] reported that 62% of exposure to blood and body fluids was due to hollow bore needle. 42.85% interns immediately washed injury site with soap and water where as 35.71% did blood investigation of patients for HIV and HBV which was an interesting finding.

On asking about guidelines for universal safety precautions, Out of 120 interns, 90% interns responded that they follow practice of washing hands after contact with blood and body fluids, 81.7% follow no needle recapping, 80% wear gloves while sampling , 85% wear apron, 70.8% wash hands after contracting different patients. Main reason for non-compliance to Universal safety guidelines is patient load (52%) particularly in medicine wards whereas lack of available staff 26% and emergency procedure (17%) also contribute significantly. Similarly, Selakar et al [5], Russi *et al*. [6], Liashram J et al.[4] showed that non-compliance to USP guidelines is mainly responsible for NSI.

Conclusion:

- The overall prevalence of NSI among interns was 23.3%.
- Male interns (78.6%) had higher incidence as compared to females showing statistical significance (p value<0.05).
- Interns posted in medical and allied departments (60.7%) had higher proportion of NSI as compared to surgery and allied department (39.3%).
- Hands (71.4%) was most common site of injury and drawing blood sample was most common procedure (53.6%).
- Fatigue (75%) was most common cause whereas patient load (52%) was most important barrier for non-compliance to USP guidelines.

Recommendations:

- Hands on training for interns during Internship orientation programme with mandatory attendance.
- Compulsory vaccination against all blood borne pathogenic infections particularly among health care workers at high risk of transmission and periodic titre check should be done.

- Engineering control methods to isolate or remove hazards from the workplace. Use of bedside needle shredding device should be encouraged.
- Contaminated needles must not be sheared or broken bent or recapped (recapping may be done using the one-handed scoop method)
- Encouraging use appropriate personal protective equipment and clothing. The employer must provide necessary equipment and clothing when there is a significant probability for exposure to blood**.**
- Reducing workload by imparting specific duty hours and also increasing number of interns posted in wards with heavy patient load.
- Further studies should be conducted by observational methods to assess the compliance of interns and other health care workers to USP.

Limitations:

- Findings cannot be generalized for all the tertiary care hospitals and for other category of health workers as Interns are more knowledgeable and follow USP better and also study was confined only in one tertiary care hospital setting.

Conflict of Interest- None
Funding- None

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