

ORIGINAL RESEARCH ARTICLE

A study on prevalence of Needle Stick Injuries (NSI) among the residents' doctorsDr. Bhavna Puwar *¹, Dr. Vaibhavi Patel¹

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ABSTRACT

Health care workers (HCW) are at great risk of getting NSI while providing patient care. Methodology: A Cross sectional study was done in the year June-September 2007 in four Municipal Corporation Hospitals attached to a Medical College among 245 residents. Information about NSI in last 1 year was taken. Result: Total 245 residents participated with Maximum number of residents from Medicine and surgery department. About 185(75.7%) residents had sustained NSI in last one year. Maximum (93%) NSI occurred in surgery Department. In medicine, surgery and Gynecology NSI was most commonly sustained during drawing blood sample. Overall in 107(57.8%) cases NSI was sustained while drawing blood sample, 105 (56.7%) cases needle disposal was the culprit. As the years of experience increased the occurrence of NSI decreased. Only 21(8.6%) residents were disposing the needle in right manner. Around 222(90%) residents were immunized against hepatitis B. Knowledge of post exposure prophylaxis (PPE) showed that 163(66.5) % resident doctors had correct knowledge about the timing of PPE. After NSI, one should wash the site with soap and water was known to 100 (40.8%) . Awareness about PPE among residents for HIV was almost nonexistent and for Hepatitis B was 29.8% and for Hepatitis C was 61%. Conclusion: NSI is very common among resident doctors. Practice of recapping is still prevalent and also responsible for many NSI. Knowledge about PPE needs to be strengthened. To avoid NSI knowledge and practice of UWP is the right solution.

Keywords: Needle Sick Injuries (NSI), Post Exposure Prophylaxis (PPE), Resident Doctors

INTRODUCTION

Needle stick injuries (NSI) are wounds caused by needles that accidentally puncture the skin.¹

Health care workers (HCWs) while providing patient care are at risk of getting NSI. Risk of infection due to NSI depends on the pathogen involved, the severity of the NSI, and the availability and use of pre-exposure vaccination and post-exposure prophylaxis.² Of the 35 million HCWs, 2 million experience percutaneous exposure to infectious diseases

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each year. Also 37.6% of Hepatitis B, 39% of Hepatitis C and 4.4% of HIV/AIDS in HCWs around the world are due to NSI.³ PPE is available for hepatitis B and HIV exposures but not for hepatitis C.² Thus to assess the occurrence of NSI and factors associated with it, a study was done among the resident doctors.

MATERIALS AND METHODS

A Cross sectional study was done in the year June-September 2007 in four Municipal Corporation Hospitals attached to a Medical College. 245 residents who consented to participate in the study were included. Selection of resident was done as per their availability and their willingness to be a part of study. Information about NSI in last 1 year was taken to minimize recall bias. Information was gathered by questionnaire method.

RESULTS

Total 245 resident doctors participated in the study. Maximum numbers of residents were from Medicine and Surgery department. About 185(75.7%) resident doctors had sustained NSI in last one year. Department wise 40 (93%) NSI occurred in Surgery Department, followed by Anesthesia, Orthopedic, ENT, Obstetrics and Gynecology Departments (Table 1). In Medicine, Surgery, Obstetric and Gynecology departments NSI was most commonly sustained during

drawing blood sample. While in Pediatrics, Ophthalmology, Orthopedics, Anesthesia and Radiology NSI was most commonly sustained during recapping the needle.

Table 1: Department wise distribution of study population as per NSI sustained (n=245)

Departments	No. (%)	NSI sustained (%)
Surgery	43(17.6)	40(93)
Medicine	48(19.6)	34(70.8)
Gynecology	34(13.9)	26(76.5)
Pediatrics	24(9.8)	17(70.8)
Orthopedics	24(9.8)	19(79.2)
Anesthesia	24(9.8)	19(79.2)
ENT	20(8.2)	15(75)
Ophthalmology	16(6.5)	10(62.5)
Radiology	12(4.9)	5(41.7)
	245 (100)	185(75.5)

Out of the total, in 107(57.8%) cases NSI was sustained while drawing blood sample, in 105 (56.7%) cases needle disposal was the cause. In 81 (43.7%) cases placing intravenous line lead to NSI and in 59 (31.9%) cases NSI was sustained while taking sutures. (Table 2)

Table 2: Modes of NSI sustained. (n=185)

Modes	No	Percent
While drawing blood sample	107	57.8
While placing intravenous line	81	43.7
While giving Injectable medicine	38	20.5
While recapping needle	25	13.5
While disposing needle	105	56.7
During needle disposal	22	11.8
With neglected needle	10	5.4
While putting incision	14	7.5
While taking sutures	59	31.8
With broken glass	13	7

* NSI was sustained by more than one mode in many cases so the total may not be 100%.

Doctors with more work experience suffered less NSI as compared to those with less work experience. Out of those who sustained NSI, 54(29.2%) residents were in the first year and 48(25.9%) in second year and 44(23.8%) in third year. (Table 3)

Table 3: Years of experience and NSI sustained

Experience (years)	No.	Percent
< 1	54	29.2
1 -2	48	25.9
2 – 3	44	23.8

3 – 4	35	18.9
4 – 7	4	2.1
	185	100

When enquired how they disposed the needle after use, it was found that 33(13.5 %) were recapping and only 21(8.6%) were disposing the needle in the right manner (Table 4).

Table 4: Methods of needle disposal by residents

Methods	No. %
Recapping	33(13.5)
Shredding	78(31.8)
Throw it in bag	92(37.6)
Recap it and throw it in bag	10(4.1)
Shred it and throw it in bag	21(8.6)
Recap it or shred it	11(4.5)
Total	245(100)

Around 222(90%) of resident doctors were immunized against hepatitis B, 16 (6.5%) were incompletely immunized and 7(2.9%) were unimmunized. (Table 5)

Table 5: Hepatitis B immunization status

Sr. No	Hepatitis B Immunization status	No. (%)
1	3 doses+ booster	86(35.1)
2	3 doses	136(55.5)
3	< 3 doses	16(6.5)
4	Unimmunized	7(2.9)
	Total	245(100)

Regarding their knowledge of post exposure prophylaxis (PPE), 163(66.5%) had correct knowledge that PPE should be taken within 2 hours. Immediate step after NSI is to wash the site and surrounding skin with soap and water and 100(40.8%) participants answered the same. About 70 (28.6%) residents believed that site should be washed with spirit. Around 31(12.7%) residents believed that it should be washed with antiseptic which is not the correct answer. Few other responses were squeezing the blood and testing HIV and HBs Ag status of the patient, changing gloves and taking vaccines.

PPE for HIV mentions two or three drug regimen, and we found that this knowledge was almost nonexistent among resident doctor and correct knowledge of PPE for Hepatitis B is immunoglobulin and vaccine and this knowledge was 73(29.8%) and for Hepatitis C there is none and it was known to 151 (61.1 %) resident doctors. (Table 6)

Table 6: Knowledge about PEP

		No.	Percent
1	Immediate action to be taken after NSI		
	Correct Knowledge	100	40.8
	Incorrect /incomplete Knowledge	145	59.2
2.	Within how much time PEP for HIV to be taken(Hrs)		
	Correct knowledge	163	66.5
	Incorrect/ incomplete knowledge	82	33.5
3.	What is the PEP for HBV		
	Correct Knowledge	73	29.8
	Incorrect/incomplete Knowledge	172	70.2
4.	PEP for HIV		
	Correct Knowledge	1	0.4
	Incorrect/incomplete Knowledge	244	99.6
5	PEP for HCV		
	Correct knowledge	151	61.6
	Incorrect /incomplete knowledge	94	38.4

DISCUSSION

In our study 85% resident doctors sustained NSI while as per *B Gurung, U Gurung* study 83.7%

doctors had sustained NSI.⁴ Our study found in 57.8% cases NSI was sustained while drawing blood sample and in 31.9% NSI was sustained while taking sutures. Similarly Sumathi Muralidhar, et al. quoted in their study among HCW, the same to be 55% and 20.3% respectively.⁵

When enquired how they disposed the needle after use, it was found that 13.5% were recapping and as per Sumathi Muralidhar et al. the practice of recapping needles after use was 66.3%.⁵ As reported by Bayapa Reddy N et al. nearly half of the doctors were immunized against hepatitis B⁶ but in our study more than 90% were immunized against hepatitis B. Considering recapping as main cause for needle stick injuries, our study found recapping was responsible for 13.5% NSI whereas study by Abhay et al found recapping responsible for 59.4%⁷ and Rahul Sharma et al. reported 34.0% NSI occurred during recapping.⁸

As regard to knowledge of immediate action after NSI, 40.8% participants believed that one should wash the site with soap and water, 28.6% residents believed that site should be washed with spirit, 12.7% residents believed that it should be washed with antiseptic. Sumathi Muralidhar, et al. found 45.5% preferred to wash the area with soap and water⁵, while 47% applied spirit/alcohol and 60.9% washed the site of injury with water and soap as per Rahul Sharma et al.⁸ Regarding their knowledge of post

exposure prophylaxis (PPE), 66.5% had correct knowledge about timing of PPE and as per Bayapa Reddy N et al. 80% doctors knew it.⁶ Knowledge of PPE for HIV was almost nonexistent among resident doctor in our study whereas as per Bayapa Reddy N et al. awareness about PEP was 70% for HIV.⁶ All the factors responsible for NSI could not be studied. As NSI for last one year was taken into consideration recall bias may prevail.

CONCLUSION

NSI is very common among resident doctors. Practice of recapping is still prevalent and also responsible for many NSI. Knowledge about PPE also needs to be strengthened. To avoid NSI knowledge and practice of UWP is the right solution.

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