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Original Research Article

Prevalence of needle stick injuries among health care workers of various hospitals: a cross sectional study in an urban district of North India

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ABSTRACT

Background: Needle stick injuries (NSI) are one of the dreaded but preventable occupational hazard posed to health care worker in various clinical settings. The causes of NSI includes injuries caused by use of hypodermic needles, blood collection needles, needles in intravenous delivery systems, needles in diagnostic aspiration procedures and needle in interventional or surgical procedures. In developing countries, needle stick injuries prevalence is also related to lack of standard operating protocol in various institution.
Methods: A cross sectional observational study was carried out in 384 paramedical, technical, auxiliary and sanitary staff of three government and three private hospitals of Meerut from November 2015 to October 2016.
Results: In our study, Overall prevalence of NSI was 77/384 (20.1%). Among sub-groups, needle stick injury was 26.6% and 31.3% in nurses, 37.5% and 16.7% in technicians, 15% and 12.5% in wardboys/aaya and 15.6% and 9.4% in sweepers of public and private hospitals respectively.
Conclusions: Standard operating protocol is the need of the hour at every medical institution and hospitals for NSI. Regular training regarding NSI, promoting early reporting and availability of immediate Post exposure prophylaxis should be ensured.

Keywords: Hospital, Healthcare workers, Needle injury

INTRODUCTION

Needle stick injuries (NSI) are one of the dreaded but preventable occupational hazard posed to health care worker in various clinical settings. As per a study by WHO, proportion of health care workers exposed to blood borne pathogens like HCV, HBV and HIV are 2.6%, 5.9% and 0.5% respectively.[1] In the developing world the incidence of NSI is higher and under-reported.[2,3] Precluding the use of post exposure prophylaxis and adding the risk of increased health care burden and impacting unimpeded supply of health services. Health care institutions must not rule out the low reporting rates of NSI and equate them low incidence rates.[4] The causes of NSI includes injuries caused by use of hypodermic needles, blood collection needles, needles in intravenous delivery systems, needles in diagnostic aspiration procedures and needle in interventional or surgical procedures.[5] In developing countries, needle stick injuries prevalence is also related to lack of standard operating protocol in various institutions.[6]

We undertook a cross-sectional study to estimate the prevalence of needle stick injuries among health care

workers in various hospital in an urban district (Meerut) of North India.

METHODS

After approval from Institutional ethical committee, A cross sectional observational study was carried out in 384 paramedical, technical, auxiliary and sanitary staff of three government and three private hospitals of Meerut from November 2015 to October 2016. Out of 384, 192(50%) staff was covered randomly from public hospitals and 192 (50%) from private hospitals.

Study participants included nurses, technicians, ward boys/aaya and sweepers. On the basis of number and availability of staff in government hospitals, out of 192 personnel, 64 nurses, 24 technicians, 40 ward boys/aaya and 64 Sweepers were included in the study from public hospitals for comparison. An equal numbers of participants from each of strata were taken from private hospitals. Information was collected on predesigned and pretested semi structured questionnaire. Inclusion criteria comprised of those who were consenting for the study and were working in medical field/ hospital for more than 3 months. Exclusion criteria consisted of participants who were working in the hospital for less than three months and Participants who were not willing to participate and those who were not available at the time of study. Data was analyzed using SPSS software (IBM).

RESULTS

Prevalence of needle stick injuries

Overall prevalence of NSI in our study was 77/384 (20.1%). Among sub-groups, needle stick injury was 26.6% and 31.3% in nurses, 37.5% and 16.7% in technicians, 15% and 12.5% in wardboys/aaya and 15.6% and 9.4% in sweepers of public and private hospitals respectively. Overall incidence of needle stick injury in Public and Private hospitals was found to be 21.9% and 18.2% respectively and this difference in incidence of needle stick injury in public and private hospitals was not found to be statistically significant (p>0.05).

Table 1: Prevalence of needle stick injury in paramedical and auxiliary staff.

	Nurse		Technician		Wardboy/aaya		Sweeper		Total	
Needle stick injury	**Public**	**Private**	**Public**	**Private**	**Public**	**Private**	**Public**	**Private**	**Public**	**Private**
	N (%)	**N (%)**	**N (%)**	**N (%)**	**N (%)**	**N (%)**	**N (%)**	**N (%)**	**N (%)**	**N (%)**
Present	17 (26.6)	20 (31.3)	9 (37.5)	4 16.7)	6 (15.0)	5 (12.5)	10 (15.6)	6 (9.4)	42 (21.9)	35 (18.2)

Table 2: Distribution of study population according to reporting personnel for injury.

	Nurse		Technician		Wardboy/aaya		Sweeper		Total	
Reporting personnel	**Public**	**Private**	**Public**	**Private**	**Public**	**Private**	**Public**	**Private**	**Public**	**Private**
	N (%)	**N (%)**	**N (%)**	**N (%)**	**N (%)**	**N (%)**	**N (%)**	**N (%)**	**N (%)**	**N (%)**
Nurse	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	4 (66.7)	1 (20.0)	2 (20.0)	0 (0.0)	6 (14.4)	1 (2.9)
Matron	4 (23.5)	4 (20.0)	1 (11.1)	1 (25.0)	2 (33.3)	1 (20.0)	2 (20.0)	5 (83.3)	9 (21.4)	11 (31.4)
Infection control officer	2 (11.8)	5 (25.0)	1 (11.1)	1 (25.0)	0 (0.0)	1 (20.0)	0 (0.0)	0 (0.0)	3 (7.1)	7 (20.0)
None	11 (64.7)	11 (55.0)	7 (77.8)	2 (50.0)	0 (0.0)	2 (40.0)	6 (60.0)	1 (16.7)	24 (57.1)	16 (45.7)
Total	17 (100.0)	20 (100.0)	9 (100.0)	4 (100.0)	6 (100.0)	5 (100.0)	10 (100.0)	6 (100.0)	42 (100.0)	35 (100.0)

Study population and reporting personnel for injury

In Public hospitals majority of staff did not report the injury ie nurses (64.7%), technicians (77.8%) and sweepers (60.0%). Only 11.8% nurses and 11.1% technicians reported to infection control officer. On the other hand in Private hospitals 25.0% nurses, 25.0% technicians and 20.0% ward boys/aaya reported their injury to infection control officer while 55.0% nurses, 50.0% technicians, 40.0% wardboys/aaya and16.7% sweepers did not report to anyone [Table 2].

Causes of needle stick injuries

In public hospital most common cause was poor disposal (61.9%) followed by individual carelessness/accident. Whereas in private hospital poor disposal was the cause in 48.6% cases and individual carelessness in 45.7%

while 9.5% staff in public and 5.7% in private hospitals did not remember the cause of injury (Table 3).

Table 3: Distribution table of causes of most recent needle prick.

Cause	Public	Private	Total
	N (%)	N (%)	N (%)
Poor disposal	26 (61.9)	17 (48.6)	43 (55.8)
Individual carelessness/ Accident	12 (28.6)	16 (45.7)	28 (36.4)
Not remember	4 (9.5)	2 (5.7)	6 (7.8)
Total	42 (100.0)	35 (100.0)	77 (100.0)

DISCUSSION

Our results show the prevalence of NSI was 20.1% among health care workers. Other studies from India have reported NSIs among healthcare workers was between 57% and 73%.[7,8] International studies from Iran and Saudi Arabia have reported incidence of 63.3% and 74% respectively. This suggests lower prevalence of NSI in our study. In our study nurses (28.9%) and technicians (27.1%) comprised the majority of health care workers affected by Needle stick injuries owing to their exposure risk to needles and sharps. In a study, devices causing NSIs were syringe needles, followed by ampoule, intravenous canula, and suture needle.[9] Other studies have reported most common device causing NSIs included the hollow bore needles, followed by suturing needle.[7,10,11]

In our every subset of health care workers have done underreporting of needle stick injuries with about 81% of health care workers not reporting their injuries and results are similar to another study from India showing around 85% of the health workers did not report NSIs.[7] One of the study from Iran showed around 82% of all NSI were unreported.[12] Higher reporting rates (40%) were reported in a study from Malaysia.[13]

In our study poor disposal practice of BMW (56%) was the commonest caused of needle stick injuries as compared to accidental (36%) causes of NSI. Our study is one of the few studies to include every sub set of paramedical and auxiliary healthcare workers for prevalence of NSI. The study was limited by its sample size, non availability of data regarding Post exposure prophylaxis and PPE usage.

CONCLUSION

The prevalence of NSI among health care workers in our study re-affirm the need for preventing NSI. The results of our study show the NSI are very common, under-reported, entirely preventable and health care workers need to have regular training for disposal of BMW and Careful handling techniques for needles and sharps. Standard operating protocol is the need of the hour at every medical institution and hospitals for NSI. Regular training regarding NSI, promoting early reporting and availability of immediate Post exposure prophylaxis should be ensured.

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