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Original Research Article

To study the incidences of needle stick injury among critical care nurses working in rural tertiary care hospital

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ABSTRACT

Needle-stick injuries (NSIs) are a hazard for nursing staff and public health. Nursing workers are at high risk for occupational exposure to blood-borne pathogens via sharp injuries of the needle-stick. Needle-stick injuries (NSIs) are described as penetrating wounds caused by a device that is contaminated with another person's body fluids. Needle-stick injuries are injuries acquired by needles like -scalp vein needles, hypodermic needles, blood sample collection needles, intracath stylets, lumbar puncture needles used to connect parts of IV delivery systems. Needle-stick injuries (NSIs) form a medium for the transmission of bloodborne infections. Strict use of personnel protective equipment while working in the hospital should be made compulsory. To study incidences of needle stick injury among nurses working in Rural tertiary care Unit, Loni. Ethical approval for this study was obtained from the Institutional Ethical Committee. Seventy-six nurses, who fulfilled inclusion criteria were included and data was obtained through survey. This study involves 76 nursing staff. Of them all, 27(35.5%) nursing staff experienced NSIs**.** The administration of medication was common action that caused most of needle-stick injuries mentioned by 14 (18.4%) nursing staff. IV cannula was the device that caused many needle-stick injuries reported by 17 (21.1%) nursing staff. The nursing professionals are the main key players in both elective and emergency situations. There is a quite higher incidence of needle stick injury among critical care nurses. This might be due to handling of emergency cases and attempting to secure the intravenous line or to deliver the medications. Creating awareness and training appropriately is mandatory for critical care nurses.

1. Introduction

Needle-stick injury (NSI) is a common occupational health issue faced by nursing staff worldwide. Needle-stick injury (NSI) has a risk of transmission of various blood-borne pathogens amongst healthcare personnel. Some work procedures such as administering injections, blood sampling, recapping, disposing of needles, handling needles, and during the transfer of blood samples from a syringe to a container are common activities causing NSIs. Needle-stick injury (NSI), is any percutaneous injury, penetration of skin resulting from a needle or other sharp object, which has been in contact with blood, tissue, or other body fluids before exposure.[1] Risk factors have been mentioned in different studies for NSI incidents such as improper use of protective equipment, working in surgical or intensive care units, insufficient work experience, low knowledge level of bloodborne diseases. The common

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blood-borne infections such as Human Immunodeficiency Virus (HIV), Hepatitis B Virus (HBV), and Hepatitis C Virus (HCV), are transmitted from NSI. Safety practices and guidelines must be followed by all healthcare providers to protect themselves from infection.[2] Among these blood-borne infections transmitted through needlestick injury, a vaccine is available for HBV, thus hepatitis B can be prevented by conducting a vaccination campaign. Vaccination protects for 10 years and efficacy is about 95%. Safety protocols following needle stick injury must be followed. The safety measures are- site must be washed with soap and water, the incident should be reported, the source should be evaluated for HBV, HCV, HIV, PEP should be started. Several studies have declared that the incidences of bloodborne pathogens in many developing countries are high, documentation of such exposure in these countries is negligible. This is the reason for conducting a study on incidences of NSI. In this study, the factors related to NSIs among nurses were assessed.

2. Material and Methods

This cross-sectional study was conducted on nursing staff working in the intensive care unit, Pravara Rural Hospital, Loni, Maharashtra, after obtaining institutional ethical clearance. All the nursing staff working in critical care unit of our hospital and willing to give informed, written consent were included in this study. The nurses who were not willing to be the part of the study and who had no experience of the critical care unit were excluded from the study.

In this study a total of 16 questions were included and answers were collected for the same from the participants.

3. Results

This study involves 76 critical care nursing staff both male and female. The results were compiled as depicted in Table no 1. Of 76 nurses, 27 (35.5%) experienced NSIs**.** Administration of medication was the common action that caused most needle-stick injuries 14 (18.4%). IV cannula was the device that caused the majority of needlestick injuries 17 (21.1%) of needle-stick injuries. This study involves 76 nursing staff of which 46 (60.5%) were male and 30 (39.5%) were female. Of them all, 27 (35.5%) experienced NSIs ,12(15.8%) experienced NSI >1year back, 7 (9.2%) experienced in the last 6months-1year and 3(3.9%) experienced in last 1-6months,2(2.6%) experienced in 1week-1month during professional life. Out of 76 staff,17 (22.4%) of staff had needle- stick injury only 1 time, while 7 (9.2%) experienced 2times and 2 (2.6%) >2times. The most common body part that had NSI was the right hand 15 (19.7%). 22 (28.9%) reported a superficial type of NSI (no bleeding) and 5(6.6%) reported a deep type of NSI (bleeding present). Majority, 19 (25%) of NSI reported needle-stick injuries were before the use of item on the patient.17(93.4%) of nurses are aware of the protocol of NSI while 5(6.6 %) are unaware.29 (38.2%) reported NSI to casualty medical officers while 9 (11.8%) did not reported.58 (76.3%) of nurses were worried about HIV and HbsAg infection transmission through NSI while 12 (15.8%) aren't worried, 3(3.9%) are worried only for HIV.

4. Discussion

Needle stick injury poses a significant risk for occupational exposures among HCW. Needle-stick injuries are the most common route by which blood-borne viruses and/or infections such as HIV and hepatitis B and C are acquired. In our study there were (35.5%) incidents of NSI among the 76 nursing staff, giving an occurrence rate of about 2.14% per annum. Studies done in India showed that the prevalence of NSIs among nursing staff was between 57% and 73%. Various studies done internationally showed a different prevalence of NSIs. A study in Pakistan showed that the prevalence of NSIs was 54.2 %,63.3% in Iran,74% in Saudi Arabia which is more than that reported in our study.[3–5]

Most staff in our study experienced needle stick injury while administering medications (18.4%) Contradictory results have been reported in studies conducted at Vellore where disposal of needles (18.6%) and in Goa where disposal of needles (31.7%) was common procedure causing injury. In our study IV cannula was the most common procedure causing NSI while Syringe needles were responsible for the majority of NSIs in two recently performed studies among Iranian HCWs. The main reason for this is due to less period of experience, handling the heavy workload duties of patients and knowledge regarding injection safety guidelines and wearing gloves, proper recapping of needles should be done. A List of instruments that are responsible for 80% of NSI has been given, these include intravenous (IV) catheter styles (21.1%), glass pieces (9.2%), scalpel blades (3.9%). In a study by Bhattarai et al, hollow bore needle has been the major instrument causing NSI.[6]

In the present study, while 50% washed the site of injury with clear running water, a matter of concern is that 6.5% applied antiseptic following NSI. The body part that had the majority of pricks was the right hand (19.7) followed by the left hand (14.5%).

Very few of the NSIs (38.2) were reported to the health care system, while 11.8% did not reported cases. Similar to a study by Al-Dabbas et al., in this study, nearly half of the participants did not report the injury with 57.14% of participants citing lack of knowledge in reporting system as the reason, and another 42.85% felt the patient has low risk.[7]Nagandla et al. in their study found the main reason for underreporting to be due to perceived low risk of the patient's status for viral infection transmission.[8]

Table 1: The results of the questions asked to critical care nurses

S.n	Variable	Category	N (%)
1	Gender	Male	46 (60.5)
		Female	30 (39.5)
2.	Age	20-25 years	2 (2.6)
		26-30 years	37 (48.7)
		31-35 years	27 (35.5)
		>35 years	10 (13.2)
3.	In which ICU are you working?	MICU	23 (30.3)
		SICU	31 (40.8)
		CCU	22 (28.9)
4	Till date have you experienced Needle-stick injury?	Yes	27 (35.5)
		No	49 (64.55)
5	Till date how many times you had needle stick injury?	None	50 (65.8)
		Once	17 (22.4)
		Twice	7 (9.2)
		Multiple times (>Twice)	2 (2.6)
6	What type of device caused injury?	Scalpel blade	3 (3.9)
		Glass piece	7 (9.2)
		IV cannula	16 (21.1)
		Not applicable	50 (65.8)
7	Which part of body had prick?	Right hand	15 (19.7)
		Left hand	11 (14.5)
		Right leg	1 (1.3)
		Don't recall	1 (1.3)
		Not applicable	48 (63.2)
8	If you had experienced needle stick injury, approximately how many days/months/years back?	1 week - 1 month	2 (2.6)
		1 month - 6 months	3 (3.9)
		6 months – 1 year	7 (9.2)
		>1 year	12 (15.8)
		Not applicable	52 (68.4)
9	What procedure was done during this incidence?	While inserting IV Cannula	4 (5.3)
		While removing IV Cannula	2 (2.6)
		While preparing medication	5 (6.6)
		While administering medications	14 (18.4)
		While assisting surgical procedure	1 (1.3)
		Not applicable	49 (64.5)
10	Do you know our hospital protocol after needle stick injury?	Yes	71 (93.4)
		No	5 (6.6)
11	Type of NSI	Superficial (No bleeding)	22 (28.9)
		Deep (Bleeding present)	5 (6.6)
		Not applicable	49 (64.5)
12	When did the injury occurred?	Before use of item on patient	19 (25)
		After use of item on patient	5 (5.5)
		Don't recall	2 (2.6)
		Not applicable	50 (65.8)
13	Did you report incidence to casualty medical officer immediately?	Yes	29 (38.2)
		No	9 (11.8)
		Not applicable	38 (50)
14	What immediate step you perform after needle stick injury?	Application of antiseptic	5 (6.6)
		Cleaning with clear water	38 (50)
		Cleaning with soap and water	17 (22.4)
		Squeezing of blood	16 (21.1)
15	which communicable disease you are worried after needle stick injury?	HIV	3 (3.9)
		HbsAg	3 (3.9)
		HIV and HbsAg	58 (76.3)
		Not worried	12 (15.8)

A Study on NSI reported a high incidence of NSIs among nursing staff; thus, occupational health and safety are important to reduce the risk of occupational exposure to NSI and the transmission of infectious diseases. Applying at least the following principles as (1) establishing and implementing policies on NSIs management, (2) establishing guidelines regarding PEP (3) applying standard precautions, (4) regular training on infection prevention and standard precautions, (5) regular implementation of guidelines, and (6) developing NSIs reporting systems that play a great role in reducing NSIs and preventing infectious disease.

5. Limitation of the study

Primary data for the study were collected from the individual healthcare providers working in the Critical care unit. The study is retrospective therefore the possibilities of recall bias.

6. Conclusion

The nursing professionals are the main key players in both elective and emergency situations. There is a quite higher incidence of needle stick injury among critical care nurses. This might be due to handling of emergency cases and attempting to secure the intravenous line or to deliver the medications. Creating awareness and training appropriately is mandatory for critical care nurses. The proper training of all the nurses using skill and simulation lab may reduce the incidence of needle stick injury however, one need to do such study in future.

7. Source of Funding

None.

8. Conflict of Interest

None.

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