Needle Stick Injuries Among Health Care Worker

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ABSTRACT

Needle stick injuries (NSIs) are wound caused by sharps such as hypodermic needle, blood collection, intravenous cannulas or needle used to connect part of intravenous delivery system. In India, authentic data on NSIs are scarce. It is known that 3-6 billion injections are given per year, of which 2/3 injection are unsafe (62.9%) and the use of glass syringe is constantly associated with higher degree of unsafety. Determinants of NSIs are over use of injections and unnecessary sharps, lack of supply of disposable syringes, safer needle devices, and sharps-disposal containers, recapping of needles after use, passing instruments from hand to hand in the operating suite, lack of awareness of hazards and lack of training. The objective is to study the prevalence and type of needle stick injuries in health care workers in Rohilkhand Medical College and hospital, Bareilly. This cross-sectional study was conducted in month of January 2012 to December 2012. Simple Random Sampling method was used for sample size 312, including 52 participants in each category. A Semi-open pre-tested validated questionnaire was used in the study. Data was analyzed using Statistical Package for the Social Sciences (SPSS) version 12. Chi-square test was applied as a test of significant. Needle stick injuries were present in 56.2% health care workers. Many times these injuries were self-inflicted. Hospital based intervention programs and awareness was effective in prevention of needle sticks injuries and our results quantitatively supported these arguments.

KEY WORDS: needle stick injuries, health care workers, simple random sampling.

INTRODUCTION:

Needle stick injuries (NSIs) are wound caused by sharps such as hypodermic needle, blood collection, intravenous (IV) cannulas or needle used to connect part of IV delivery system. Because of the environment in which health care workers (HCWs) work, many worker are at an increased risk of accidental needle stick injuries. Globally NSIs are the most common source of occupational exposures to blood and the primary cause of blood-borne infections to HCWs. Determinants of NSIs are overuse of injections, lack of supplies of disposable syringes, safer needle devices, sharps-disposal containers, recapping of needles after use, passing instruments from hand to hand in the operating suite, lack of awareness of hazard and lack of training are the important determinants of NSIs. Health-care workers working in the operation theatre, labour rooms, emergency, laboratories and ward have an increased risk of exposure and they experience significant fear, anxiety and emotional distress which can sometimes result in occupational and behavior changes.

As the data of needle stick injuries are of ten under reported, the health care institutions should not interpret low report ingrate while 90% of the occupational exposuresoccur in the developing world, 90% of the reports of occupational infection occur in the United States and Europe. NSIs exposure in African countries is higher than elsewhere and a significant public health issue due to the fear of occupational infections faced by ill-paid, ill-protected and overworked health-care workers. It is known that 3-6 billion injections are given per year, of which 2/3 injections are unsafe (62.9%) and the use of glass syringe is constantly associated with higher degree of poor safety.

Needle stick injuries have significant indirect consequences in health care delivery especially in the developing countries, where already the qualified work force is limited with respect to the diseases burden in the population. These injuries not only
potentiate negative health consequences but also cause emotional distress in health care workers which results in missed work days and directly affect the health care services and resources. An authentic data on NSIs is scarce because of underreporting of NSIs. The misconception exists that the healthcare industry is clean and without hazard, when in fact the chemical and blood-borne exposures encountered can be career and life-ending. The risk of occupational transmission has been extrapolated by the WHO to convey the risk of an unsafe injection. As a result these workers are at risk of occupational acquisition of blood borne pathogens such as hepatitis B virus (HBV), hepatitis C virus (HCV), Human Immunodeficiency Virus (HIV) and other diseases. According to WHO study, the annual estimated proportion of HCWs exposed to blood borne pathogens globally were, HCV (2.6%), HBV (5.9%), HIV (0.5%). Other infections transmittable through needle sticks include syphilis, malaria, and herpes.

The occupational risk of needle stick injuries not only affects the quality of care delivered but also the safety and well-being of care providers. The consequences of HBV infection are potentially fatal and include chronic liver disease, cirrhosis, and primary hepatocellular carcinoma. Hepatitis C and HIV, are two most serious of the 20 blood-borne pathogens that healthcare workers are exposed to in their daily work caring for the world's health.

Seventy percent of the world's HIV population lives in Sub-Saharan Africa, but only 4% of worldwide occupational cases of HIV infection are reported from this region. The average risk of transmission of HIV to a health care worker due to percutaneous exposure to HIV infected blood has been estimated blood as three in one thousand. Factors that increase risks of transmission of HIV include a deep wound, visible blood on the device, a hollow-bore blood-filled needle, use of the device to access an artery or vein, and high viral load status of the patient.

Knowledge on the transmission of blood borne disease in health care facilities is very limited and unsafe practices are common. Additionally there is a lack of regulation and polices to protect health care workers from exposure.

AIM AND OBJECTIVES:
To study the prevalence and type of needlestick injuries among health care workers in a tertiary care hospital, Bareilly.

MATERIALS AND METHODS:
A cross-sectional study was carried out to study the prevalence and type of needle stick injuries among the health care workers in month of January 2012 to December 2012 at Rohilkhand Medical College and Hospital, Bareilly. The Sample size derived was 281. An additional 10% for non-response was added to give a sample size 309 HCWs. Final sample size of 312 HCWs was taken for equal distribution of the respondents in each group. Total 312 participants were imparted in the study comprising 52 participants in each category. HCWs working in various departments, where exposure to needle stick injury might occur were taken. They were categorized on the basis of their occupation i.e. Resident doctors, Interns (M.B.B.S), Nursing staff, Nursing students, Lab technician, and OT technician and individuals were selected randomly from each selected occupation. The inclusion criteria were health care workers in the hospital, both male and female and including those professionals who normally use the needle. Exclusion criteria were all professors, specialists, consultants and the health care workers of the departments who do not normally use the needle stick. Data collection was done by using a semi-open, pre-tested validated questionnaire that was filled by the participant. The questionnaire was constructed in English. Investigator visited the hospital on one day during the survey period to distribute and collect these self-administered questionnaires from the HCWs. Data thus collected were entered into a computer-based spreadsheet for analysis and Statistical package for social science was used for calculations. Chi square test was applied to establish the statistical association between the two variables. p value of <0.05 was considered statistically significant.

RESULTS:
Among 312 HCWs in the study, it was observed that 164 HCWs were encountered with
needle stick injuries. The prevalence of needle stick injury among HCWs was 52.6%. It was observed that two or more needle stick injuries maybe found in the same person. Nursing students and OT technicians have got the highest occurrence of needle stick injuries (69.2%) followed by nursing staff (67.3%) however it was lower among the resident doctors (30.8%) and lab technician (34.6%) because of lesser exposure with needle. Table 1 tells about that which category of the HCWs is more commonly affected by the NSI during the past twelve month. The main source of the injuries in present study was self-inflicted 134 (81.7%) which was highest among nursing students (25.4%) followed by nursing staff (24.6%) and lowest among the resident doctor (8.9%) which was due to the lesser exposure to the needles. Interpretation of table 3 and 4 shows that statistical association was found highly significant between the presence and absence of Needle Stick Injury variable, Source of injury was 'self-inflicted' and 'someone else variable' (Table 1).

Table 2 shows that majority of the injuries were observed during the intravenous procedure (51.2%) followed by intramuscular (IM) procedure (45.1%). It also shows that majority of lab technicians were injured by needle stick during intravenous procedure (83.3%) followed by nursing staff, nursing students, OT technicians, interns and resident doctors (62.9%, 55.6%, 44.4%, 34.8% and 18.8% respectively).
respectively). Highest numbers of resident doctors (81.3%) were injured during intramuscular procedures followed by OT technicians, interns, nursing students and nursing staff (55.6%, 52.2%, 44.4% and 28.6% respectively). During subcutaneous procedures, only 8.7% of interns and 2.9% of staff nurses were injured. Similarly only 16.7% lab technicians along with 5.7% of staff nurses and 4.3% of interns were injured during intradermal procedures. While during suturing, 12.5% of resident doctors were injured followed by 5.7% of staff nurses, 5.6% of OT technicians and 4.3% of interns (Table 2).

The most common source of NSIs was needle (75.6%) of the disposable syringe in our study followed by suture needle (22.0%) and re-usable needle (2.4%) because of more usage of disposable syringes compare to other, which was highest among O.T. technicians (100%) followed nursing staff (94.3%) and nursing students (88.9%) respectively. Suture needle (52.8%) was the main cause of injuries among O.T. technicians (52.8%) (Table 3).

DISCUSSION:

The prevalence of needle stick injury came out to be 52.6% which is in consonance with study conducted by Musa (57.1%)[18] among primary health care worker in northern state of Nigeria however this percentage is much higher (52.6%) than the study conducted by Rampal in Malaysian (23.5%)[19] where as higher prevalence of NSIs was reported by various studies[20,21].The main cause of the injury in present study was self-inflicted (81.7%). This finding is similar with that of study conducted by Sharma et al[10] (84.4%) however study done by Goswami et al[22] shows that 100% of the reported injuries were self-inflicted which was higher than our study (Table 1). In this study, 81.3% of the resident doctors were injured during intramuscular procedures and injury accounted due to suturing was 12.5% while in the study conducted by Lee et al 81.8% of house officers were injured during suturing and 31.8% were injured during parenteral injections (Table 2).

The needle on the disposable syringe (75.6%) was the most common source of the NSIs in the study conducted by Sharma et al[19] study while in our study 76.9% of the injuries were occur due to disposable needle whereas in [1] Various other studies like Muralidhar, Goswami[22] had reported similar findings. The degree of freedom for chi square test can be calculated by using (row-1) (column-1), according to this (6-1) (3-1) = 10 has been taken in table 1 and 3 (Table 3).

CONCLUSION:

Needle sticks injuries is a global public health issue that needs attention of health policy makers.
Hospitals are the best avenue to address this global problem and our result quantitatively supported this arguments. The best hospital based intervention program will be one, which will reduce prevalence of NSIs. Public health persons especially HCWs have to lead in the hospital based interventions program.

Various intervention programs may be:

**a) Orientation and Training Program:** Reducing NSI among health care providers by educating the target groups (medical student, nursing students etc.) and evaluate it before and after design and implementation of the program specially making them understand the Dos and Don’ts while handling the needles and sharps.

**b) Comprehensive Program:** Safe work practice and safe needle device is a part of comprehensive program to prevent the transmission of blood borne pathogens.

**c) Universal precaution:** HCWs must follow CDC guidelines for safe healthcare practices i.e. they should always use personal protective equipments.

**Limitation - Consultant are not taken in our study because of lesser exposure with needle stick. Recall bias can not be ruled out as the recall period is long enough to be remembered. There is a possibility of concealing the actual number of NSIs by the respondents due to fear of humiliation.**

**REFERENCES:**


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