RESEARCH PAPER | Medical Science | Volume : 3 | Issue : 7 | July 2013 | ISSN - 2249-555X

Study on Needle stick injuries among nurses of a tertiary care hospital of Assam

KEYWORDS: Needle-stick injuries, HIV, hepatitis, post-exposure prophylaxis

Dr. Ekta Gupta
Dr. PNB Girls hostel, Room no. 27, Assam Medical College and Hospital, Dibrugarh, Assam – 786002

Dr. Vikrant Katiyar
PG Hostel no. 8, Room no. 7 Assam Medical College and Hospital Dibrugarh, Assam – 786002

ABSTRACT *Background: Accidental needle stick injuries (NSI) sustained by healthcare workers are a common occupational hazard in healthcare settings. Objectives: To assess the prevalence and response to NSI among nurses in a tertiary care hospital of Assam. Methods: A cross-sectional study was conducted among nurses of Assam Medical College Hospital where 190 nurses were interviewed using a predesigned and pretested questionnaire regarding occurrence of NSI. Results: Out of 190 nurses, 102(53.7%) reported having one or more episodes of NSIs in their career. 38(37.3%) of injuries occurred during recapping of needles. At the time of injury, only 54(52.9%) nurses wore gloves. 62(60.8%) washed the site of injury with soap and water while 20(19.6%) did nothing. Only 8(7.8%) of the nurses undertook post-exposure prophylaxis (PEP) against HIV/AIDS after their injury. Conclusion: The study shows that NSIs are quite common among nurses. There is an urgent need to provide training to nurses regarding safe work practices and procedure to be followed in case of NSI.*

Introduction:
Needle stick injuries(NSIs) present the single greatest occupational hazard to medical personnel.[1] While as many as twenty blood borne pathogens can be transmitted through accidental needle stick injury,[2] the potentially life threatening are HIV, hepatitis B virus(HBV) and hepatitis C virus (HCV).[3] The average risk of transmission of HIV to a health care worker after percutaneous exposure to HIV-infected blood has been estimated as 0.3% while that of HBV is 9 to 30% and HCV is 1-10%.[4] According to a WHO study, the annual estimated proportions of health-care workers (HCW) exposed to blood-borne pathogens globally were 0.5% for HIV, 5.9% for HBV, and 2.6% for HCV.[5] NSIs are responsible for 37.6% of Hepatitis B, 39% of Hepatitis C and 4.4% of HIV/AIDS in health-care workers around the world.[6] Worldwide three million HCWs experience percutaneous exposure to blood-borne viruses each year(two million HBV, 900,000 HCV and 300,000 HIV).[7] The most affected category of HCWs are the nurses who are involved in 42% to 74% of the reported NSIs.[8-10] NSIs have significant indirect consequences in health care delivery especially so in the developing countries, where already the qualified work force is limited.

The present study addressed this important issue of NSI and assessed the prevalence and response to NSI among nurses in a tertiary care hospital of Assam

Subjects and Methods:
A cross-sectional study was conducted among nurses working in Assam Medical College and Hospital during September to December 2011. The population under study included all the nurses working in the hospital during that period. Nursing staff that was on leave (maternity, annual, sick leave) during this period was excluded from the study. A total of 220 nursing staff works in the hospital out of which 20 were on leave and 10 did not respond to the questionnaire. So, the sample size was 190. The nurses were contacted in person and told about purpose of the study and that their responses shall be kept anonymous. Informed consent was taken from each respondent before conducting the interview. Data was collected by personal interview using a predesigned, pretested proforma.

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 was compiled and analysed using standard statistical procedures.

Results:
Out of a total 220 nurses, 190 nurses participated in the study. Response rate was therefore 86.4%. Out of 190, 102 (53.7%) nurses reported having had one or more episodes of NSI in their career. 52 (27.4%) of the respondents reported having received a NSI within the last 12 months.

The demographic characteristics of the participants are shown in Table 1. The mean age of nurses was 36.87±11.49 years, with a minimum age of 21 years and a maximum of 59 years. The questions asked thereafter pertained to the most recent NSI that the nurses had got. Two third (70.6%) of nurses experienced NSI in ward or bedside whereas only few got NSI in operation theatre (17.6%) and emergency room (11.8%). Two-third (68.6%) of the nurses experienced NSI in morning shift where as others sustained NSI in evening (21.6%) and night shift (9.8%). Hollow bore needles were responsible for a majority (82 or 80.4%) of the NSIs while solid-bore needles were involved in 8(7.8%) of the cases. Figure 1 shows the pricking agents responsible for NSI.

Information was also elicited regarding the timing of the injury. In 48 (47.1%) cases, the injury occurred during the use of needle while 38(37.3%) occurred after use but before disposal of the needle. Recapping of used needles was the most common procedure responsible for NSI(37.3%) followed by process of administering injections(29.4%), during operations(17.6%) and during disposal(15.7%) as shown in Figure 2.

Of the respondents, 86 (84.4%) attributed the NSI as having been self-caused, while the remaining 15.6% attributed it to someone else. Among the 102 respondents who had received a NSI, only 54 (52.9%) were wearing gloves at the time of the incident. In 62 (60.8%) of the NSI incidents, there was active bleeding from the wound. Among the respondents having a NSI, 12 (11.8%) reported having had a NSI involving a high-risk patient, "high risk" being defined as known history of HIV, hepatitis B or C, or IV drug use. It was found to be quite low as clinical history of some patients was unknown to the nurses.

Out of 102 nurses who had a NSI, 20(19.6%) did nothing while similar no.(19.6%) applied only spirit. 10(9.8%) washed the wound with soap and water while 44(43.1%) washed with soap and water and applied spirit. Only 8(7.8%) of the nurses got their blood tested immediately after the injury and undertook post-exposure prophylaxis (PEP) against HIV/AIDS.

Volume : 3 | Issue : 7 | July 2013 | ISSN - 2249-555X

Only 28(27.5%) nurses reported the injury to their seniors. Overall, only 80(42.2%) participants were aware of the post-exposure prophylaxis for HIV/AIDS.

Discussion:

In the present study, a large majority (53.7%) of the nurses reported having received a NSI in their career, which is a concerning number. Similar studies in different areas of the world showed variations in the proportions of nurses sustaining NSIs during patient care in the hospital settings. A study in tertiary hospital of Pakistan showed that 67% of nurses had sustained at least one NSI in their career.[11] In our study, 27.4% reported having a NSI in last 12 months which was similar to a study done in USA.[8] A study in a tertiary care hospital of Goa showed that 34.8% of the HCWs had experienced an accidental NSI in the last 12 months.[12] Most (84.4%) of the injuries were admitted to be because of error by self, a figure similar to earlier findings.[13] In the present study , most of the injuries (80.4%) were from a hollow-bore needle as observed previously too.[14,15]

Wearing gloves is known to be an important line of defence but in our study, 47.1% of the nurses had not been wearing them at the time of their injury. Lai Kah Lee et al. in their study reported that out of 71 cases of NSIs, 62% had worn gloves during the procedure.

An important finding was that a lot of injuries occurred not during use itself, but rather during the handling between use and its disposal, as seen earlier too.[14]During safety training programs, it should be emphasized that there is need to maintain utmost care and caution during the in-between handling also. Several studies have shown recapping to be an important cause of NSI[5,14,17,18]. In our study too, most of the injuries (37.3%) occurred during recapping.

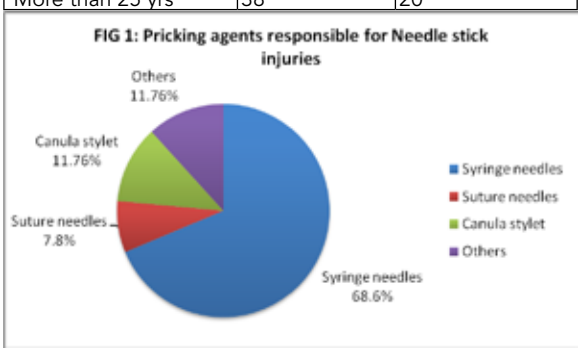
In present study while 60.8% washed the site of injury with water and soap, a matter of concern is that 19.6% did nothing following their most recent NSI. Only 8 (7.8%) of the HCWs took post-exposure prophylaxis (PEP) against HIV/AIDS after their injury. Singru SA et al. in their study reported that 21.6% of health care workers exposed to blood and body fluids took PEP for HIV.[19] Very few of the NSIs got reported to the health care system. In our study, only about one in four (27.5%) of the HCWs reported their injury to a supervisor or senior. Askarian et al.[13] in their study found that 82% of all injuries went unreported.

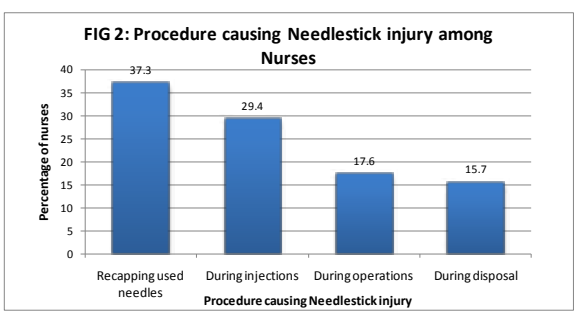
Conclusion:

Needle stick injuries represent an omnipresent occupational hazard that people working in a hospital face daily. While it may not be practically feasible to avoid their occurrence altogether but their occurrence can definitely be minimized to a large extent. Prevention of NSI is the best way to prevent several diseases in nurses. Training on universal safety precautions, proper sharps disposal and action to be taken in case of injury needs to be given to all categories of health care workers and it should be an ongoing activity at the hospital. It is recommended that every hospital should have a uniform NSI policy covering safe work practices, safe disposal of sharps, procedures in event of NSI, training including pre-employment training, monitoring and evaluation of needle stick injuries and procedures for reporting NSIs.

Table 1: Demographic Characteristics of the Participants (N=190)

Description	Number (N)	Percentage(%)
Age		
Upto 30 yrs	80	42.1
31-40 yrs	40	21.1
41-50 yrs	38	20
More than 50 yrs	32	16.8
Work experience		
0-5 yrs	76	40
6-15 yrs	48	25.3
16-25 yrs	28	14.7
More than 25 yrs	38	20





REFERENCE

1. Kelen GD, Fritz SF, Qaqish B. Unrecognized HIV infection in emergency Department patients. N Engl J Med.1998; 38:1645–1650 | 2. Jagger J, Hunt EH, Brand-Elnaggar J, Pearson RD. Rates of needle stick injury caused by various devices in a university hospital. N Engl J Med.1988; 319: 284–288. | 3. De Laune S: Risk reduction through testing, screening, and infection control precautions— with special emphasis on needle stick injuries. Infect Control Hosp Epidemiol. 1990; 11(10):563–565. | 4. http://www.nacoonline.org/National_AIDS_Control_Program/PEP_full/ [last accessed on 25th January, 2012] | 5. Pruss-Ustun A, Rapiti E, Hutin Y. Sharps injuries: Global burden of disease from sharps injuries to health-care workers. Geneva, World Health Organization, 2003 (WHO Environmental Burden of Disease Series, No. 3) | 6. http://www.who.int/occupational_health/topics/needinjuries/en/[Last accessed on 25th January, 2012] | 7. World Health Report 2002: Reducing risks, promoting healthy life. Available from: http://www.who.int/whr/en. [Last accessed on 2012 Jan] | 8. Jennifer M. Lee, Marc F.Botteman, Lars Nicklasson et al. Needle stick injury in acute care nurses caring for patients with diabetes mellitus. Current Medical Research & Opinion 2005; 21(5): 741-747 | 9. Askarian S, Shaghaghian S, Gillen M. Body Fluid Exposure in Nurses of Fars Province. Southern Iran. Arch Iranian Med 2008; 11(5):515–521. | 10. Pellissier G, Miguéres B, Tarantola A, et al. Risk of needle stick injuries by injection pens. J Hosp Infect 2006; 63:60–64. | 11. Habib H, Ahmed Khan E, Aziz A. Prevalence and Factors Associated with Needle Stick Injuries among Registered Nurses in Public Sector Tertiary Care Hospitals of Pakistan. International Journal of Collaborative Research on Internal Medicine & Public Health 2011; 3(2):124-130. | 12. Salelkar S, et al. Needle Stick Injuries among Health Care Workers at a Tertiary care hospital. Indian Journal of Public Health 2010; 54: 18-20 | 13. Askarian M, Malekmakan L. The prevalence of needle stick injuries in medical, dental, nursing and midwifery students at the University teaching hospitals of Shiraz, Iran. Indian J Med Sci 2006; 60: 227-32. | 14. Ebrahimi H, Khosravi A. Needlestick injuries among nurses. J Res Health Sc 2007;7:56-62. | 15. Rele M, Mathur M, Turbadkar D. Risk of needle stick injuries in health care workers - A report. Indian J Med Microbiol 2002; 20: 206-7. | 16. Lee LK. Implications of the prevalence of needle stick injuries in a general hospital in Malaysia and its risk in clinical practice. Environ Health Prev Med 2005;10: 33-41. | 17. Kermode M, Jolley D, Langkham B, Thomas MS, Crofts N. Occupational exposure to blood and risk of bloodborne virus infection among health care workers in rural north Indian healthcare settings. Am J Infect Control 2005; 33: 34-41. | 18. Pournaras S, Tsakris A, Mandraveli K, Faitatzidou A, Douboyas J, Tourkantonis A. Reported needlestick and sharp injuries among health care workers in a Greek general hospital. Occup Med (Lond) 1999; 49: 423-6. | 19. Singru SA, Banerjee A. Occupational exposure to body fluids among health care workers in a teaching hospital in Mumbai, India. Indian J Community Med 2008; 33:26-30.