

Needle Stick injuries among doctors working in a tertiary care hospital of Karachi

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Objective: To determine the frequency of Needle Stick Injury (NSI) among doctors working at a tertiary care public hospital and their attitudes towards safe needle practice.

Methodology: This survey was performed during January and February 2010 in Civil Hospital, Karachi. Data were collected using a self-reporting questionnaire that included demographic information, duration of clinical experience, HBV vaccination and its titer, usage of protective gloves during venipuncture, number of NSI during last six months, post exposure prophylaxis (PEP) measures used and the practice for discard of used needles.

Results: Total 155 doctors participated with mean clinical experience of 20.06 ± 30 months. 93% respondents were vaccinated against HBV but only 24% knew their antibody titer. Only 31% always wore gloves while performing

venipuncture. For discard of used needles, 49.7% recapped and threw, 41.3% bend and threw and only 9% used needles cutters. Nearly half (43%) suffered from NSI during last six months. Among sufferers, 34% discarded blood, 13% washed with soap and water, 28% did nothing after the incident. Only 9% reported the incident to the concerned authorities.

Conclusion: There were several deficiencies in safe needle practices and there was lack of adverse incident reporting facility and guidelines. Increased awareness about the hazards, preventive measures and reporting strategies after NSI will help to optimize the occupational safety of health care workers. (Rawal Med J 2013;38: 226-229).

Key words: Needle stick injuries, health care workers, occupational safety.

INTRODUCTION

Needle stick injury (NSI) is the injury sustained by health care workers (HCW) while providing care to the sick. The most harmful pathogens that can be transmitted through NSI include human immunodeficiency virus (HIV), Hepatitis B virus (HBV) and Hepatitis C virus (HCV).¹ The risk of transmission depends on the viral load of the infected patient and the quantity of blood injected during injury. Estimated risk of transmission after NSI for HIV ranges from 0.2-2%, for HBV 6-40 % and 2.7-10 % for HCV.^{2,3} The worldwide increase in the incidence of these infections raises the concern regarding the safety of HCW.¹⁻⁵ In Pakistan, the estimated prevalence rate of hepatitis B and C is intermediate, while prevalence of HIV is low.⁵ A survey by National Research Council showed that prevalence of hepatitis B and C infections was 2.5% & 4.8%, respectively.⁶ This grave situation is further aggravated by excessive

handling of reused needles, high patient demand for injections, non availability of gloves and lack of devices for safe discard of needles in our country.⁶⁻⁸ There are no hospital based guidelines for pre and post exposure prophylactic measures.⁸ Further, when these incidents occur, they are not reported to concerned authorities, reflecting the lack of awareness among concerned authorities and HCW.⁶⁻¹⁰ The fear of infection and its consequences after injury with a contaminated needle create significant stress and anxiety among health care providers and their families.¹⁰⁻¹² Although up to 90% of these injuries occur in developing countries, the number of studies addressing this serious issue is less compared to developed nations.¹⁰ The aim of this study was to determine the frequency of NSI among doctors working at a tertiary care public hospital and their attitudes towards safe needle practice.

METHODOLOGY

This survey was performed during January and February 2010 in Civil hospital, Karachi, Pakistan which is a 1670-bed tertiary care hospital in public sector and is one of the teaching hospitals affiliated with Dow University of Health Sciences (DUHS). Data was collected in the form of self-reporting questionnaire. Consent was implied by the voluntary return of the questionnaire.

The questionnaire asked about the demographic information, duration of clinical experience, HBV vaccination and its titer, usage of protective gloves during venipuncture, number of needle stick injuries during last six months and the post exposure prophylaxis (PEP) measure used and practice regarding discard of used needles. A period of 6 months was taken to minimize recall bias. Data was analyzed by SPSS version 17.

Results

Total 155 doctors participated in this study which included 43.8% (68) males and 56.2% (87) females. Among them, 60% (94) were interns, 33% (52) were residents and 7% (9) were consultants. Mean duration of clinical experience was 20.06±30 months. 93% respondents were vaccinated against HBV but only 24% knew their antibody titer. Among respondents, only 31% always wore gloves while performing venipuncture, 55% wore gloves for high risk patients and 14% did not wear gloves at all.

Table 1. Frequency of needle stick injury.

Needle Stick Injury	n (%)
Nil	88 (56.7)
1-2	55 (35.5)
3-4	8 (5.2)
≥5	4 (2.5)

43% (67) suffered from NSI during last six months (Table 1). Among sufferers, 28% (19) did nothing after the incidents, while only 9% reported to the seniors. Common measures taken included discarding of blood from injury site and washing the site with disinfectant soap and water. Frequencies of various post exposure prophylaxis measures are shown in Table 2.

Table 2. Frequency of various post exposure prophylactic measures taken.

Measures	n (%)
Discard blood	23 (34)
Apply disinfectant	22 (33)
Wash with soap & water	9 (13)
Report to senior	6 (9)
Wash with spirit	6 (9)
Antibody titer check	6 (9)
Get vaccinated	3 (5)
Did Nothing	19 (28).

While responding to discarding of used needles, 49.7% (77) recapped and threw the needle, 41.3% (64) bended and threw and only 9% (14) used needles cutters. About half of the respondents have needle cutters in their ward and 9% didn't know about their presence.

DISCUSSION

Our study highlighted that high frequency of needle stick injuries was observed among doctors working at a tertiary care hospital of Pakistan. However, this is comparable to wide range of frequencies of NSI from various countries worldwide. Clement et al reported a high rate of NSI (88.4%) among surgical residents of Nigeria.⁴ Leon et al showed that about 64% of interns from a medical school of Costa Rica suffered from NSI during their internship.¹³ Mubashir et al from Karachi, reported that 66% of health care workers suffered NSI, mostly from contaminated needle.⁸ Ferguson reported from Mexico that 34% of HCW sustained NSI during three months period.¹⁴ Among developed countries, Richard et al reported that 39% of anesthetists from Australia and New Zealand suffered NSI during a 12 months period and 90% of them were immunized against HBV but only 20% knew their antibody titer.¹⁵ This is much comparable to our study where out of 93% respondents who were vaccinated for HBV, only 24% knew their antibody titer.

Use of gloves while performing venipuncture is considered as a safety measure against NSI. In our study, only 31% always wore gloves while performing venipuncture. In a study from Australia, Richard et al found that 37% of anesthetists wore

gloves during procedures.¹⁵ A study from Malaysia showed that highest number of incidents of NSI occurred during venipuncture followed by setting up drips and giving parenteral nutrition and there was decreased number of incidents among those who usually practiced standard precautions.¹⁶ Mubashir et al in their study highlighted the gravity of situation in Pakistan, where almost 90% of health workers were not wearing gloves during venipuncture.⁸

About 50% of the respondents recapped used needles and 41% bend and threw them after use, which is considered as an unsafe practice. A study from Australia reported that 67% of anesthetists recapped needles.¹⁵ Nsubuga et al showed in a study from Uganda that 50% of nurses recapped needles and also showed significantly increased risk of NSI among those who recapped it.¹⁷ Raghavendran et al showed that 43% of HCW from two district hospitals of UK recapped needles and showed that about half of the respondents were unaware of the safer devices in their practice.¹⁸ In our study, 58.7% of respondents had needle cutters in their wards but only 9% used them; this is probably due to lack of awareness, increase workload and high demand for injections.

Our study also showed inadequate knowledge of measures taken after NSI among the respondents as 28% did nothing after that. A study from Nigeria showed that after exposure, only 16.8% of HCW reported that incident, 8.4% screened the patient for HIV, 7.7% for HBV and 5.2% went for their medical checkup and immunization.¹⁹ Kingston from Australia showed that common barriers to reporting incidents included time constraints, unsatisfactory processes, deficiencies in knowledge, cultural norms, inadequate feedback, beliefs about risk and a perceived lack of value in process.²⁰

Studies showed that both the frequency and consequences of NSI can be minimized by increasing awareness of safe needle practice.²¹⁻²²

Stein et al showed lack of awareness about risk of transmission of blood borne pathogens after sustaining NSI from an infected person among doctor and nurses working in three teaching hospitals of Birmingham, UK.²³ A study from China reported that a structured training in prevention of

occupational exposure to blood borne pathogens decreased the incidence of NSI among nursing students.²⁴ Nsubuga from Africa showed that the strongest risk factor for needle stick injuries was lack of any teaching session on such injuries in work place.¹⁷

CONCLUSION

Our study highlighted several deficiencies in safe needle practice. This results in high frequency of needle sticks injuries and poses risks to doctors working in tertiary care teaching hospital of Pakistan. There is also lack of adverse incident reporting facility and guidelines in our government sector teaching hospitals. Increased awareness about the hazards, preventive measures and reporting strategies after needle injuries will help to optimize the occupational safety of health care workers.

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Conception and design: MI, MJ

Collection and assembly of data: MI, SA

Analysis and interpretation of the data: MI, SA

Drafting of the article: MI, MJ

Critical revision of the article for important intellectual content: KIM

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REFERENCES

- Centers for Disease Control and Prevention. Updated U.S. Public Health Service. Guidelines for the Management of Occupational Exposures to HBV, HCV, and HIV and Recommendations for Postexposure Prophylaxis. *MMWR* 2001;50(11):1-42.
- Hanrahan A, Reutter L. A critical review of the literature on sharp injuries: epidemiology, management of exposure and prevention. *J Adv Nurs* 1997;25:144-154.
- Goldmann DAJ. Blood-borne pathogens and nosocomial infections. *J Allergy Clin Immunol* 2002;110(2 suppl):S21-6.
- Clement AA, Emma R, Johnson A. Survey of the knowledge, attitude and practice of Nigerian surgery trainees to HIV-infected persons and AIDS patients. *BMC Surg* 2002;2:7.
- Khattak M F, Salamat N, Bhatti F A, Qureshi T Z. Seroprevalence of hepatitis B, C and HIV in blood donors in northern Pakistan. *J Pak Med Assoc* 2002;52:398-402.
- Qureshi H, Bile KM, Jooma R, Alam SE, Afridi HU. Prevalence of hepatitis B and C viral infections in

- Pakistan: findings of a national survey appealing for effective prevention and control measures. *East Mediterr Health J* 2010;16 Suppl:S15-23.
7. Jawaid M, Iqbal M, Shahbaz S. Compliance with standard precautions: A long way ahead. *Iranian J Publ Health* 2009;38(1):85-8.
 8. Aslam M, Taj T, Ali A, Mirza W, Ali H, Dar MI. Needle stick injuries among health care workers of public sector tertiary care hospitals of Karachi. *J Coll Phy Surg Pak* 2010;20(3):150-3.
 9. Akhter R, Kazi Y, Khan KM, Ramzan A. Status of Hepatitis B vaccination amongst health care workers and their knowledge about prevention strategies. *J Surg Pak Jun* 2006;11(2):62-6.
 10. Sagoe-Moses C, Pearson R D, Perry J, Jagger J. Risks to health care workers in developing countries. *N Engl J Med* 2001;345:538-41.
 11. Trim JC, Elliot TSJA. Review of sharps injuries and preventative strategies. *J Hosp Infect* 2003;53:237-42.
 12. Louie T. Occupational hazards. *New Engl J Med* 2005;353:57-9.
 13. Leon MP, Rivera A, Chinchilla A. Occupational accidents and knowledge about universal precautions in medical interns of Costa Rica. *Antiviral Therapy* 2003;8(Suppl. 1):S517-S8.
 14. Ferguson KJ, Howard Waitzkin H, Beekmann SE, Doebbeling BN. Critical Incidents of Non-adherence with Standard Precautions Guidelines Among Community Hospital-based Health Care Workers. *J Gen Intern Med* 2004; 19:726-31.
 15. Richards MJ, Jeukin GA, Johnson PD. Universal precautions: attitudes of Australian and New Zealand anesthetists. *Med JAust* 1997;166(3):38-40.
 16. Norsayani MY, Noor HI. Study on incidence of needle stick injuries and factors associated with this problem among medical students. *J Occup health* 2003 ;45(3):172-8.
 17. Nsubuga FM, Jaakkola MS. Needle stick injuries among nurses in sub-Saharan Africa. *Trop Med Internat Health* 2005;10:773-81.
 18. Raghavendran S, Bagry HS, Leith S, Budd JM. Needle stick injuries: A comparison of practice and attitudes in two UK District General Hospitals *Anesthesia* 2006;61:867-72.
 19. Ofili AN, Asuzu MC, Okojie OH. Knowledge and practice of universal precautions among nurses in central hospital, Benin-city, Edo state, Nigeria. *Niger Postgrad Med J* 2003;10(1):26-31.
 20. Kingston MJ, Evans SM, Smith BJ, Berry JG. Attitudes of doctors and nurses towards incidents reporting : a qualitative analysis. *Med JAus* 2004;181:36-39.
 21. Haiduven DJ, Maio TMD, Stevens DA. A five-year study of needle stick injuries: significant reduction associated with communication, education, and convenient placement of sharps containers. *Infect Control Hosp Epidemiol* 1992;13: 265-71.
 22. Kim LE, Jeffe DB, Evanoff BA, Mutha S, Freeman B, Fraser J. Improved compliance with universal precautions in the operating room following an educational intervention. *Infect Control Hosp Epidemiol* 2001;22(8):522-4.
 23. Stein AD, Makarawo TP, Ahmad MFt 2003;54(1):68-73.
 24. Wang H, Fennie K, He G, Burgess J, William AB. A training programme for prevention of occupational exposure to bloodborne pathogens: impact on knowledge, behaviour and incidence of needle stick injuries among student nurses in Changsha, People's Republic of China. *J Adv Nurs* 2003;41(2):187-94.