

Needle Stick Injury in High Risk Groups

AHMAD UZAIR QURESHI, SYED ASGHAR NAQI, ALAA ISSA TAYEH MUSTAFA, KHALID MASUD GONDAL

ABSTRACT

Introduction: Needle stick injury is one of the most important risk factor for the contraction of highly infectious transmissible diseases and the paramedical staff is at high risk of receiving such injuries. World Health Organization (WHO) estimated a world wide load of 66,000 health care workers contracting hepatitis C in the year 2000. Lack of awareness regarding the transmissible diseases in the paramedical staff specially sweepers; ward boys; OT assistants and trainee nurses. In our study we desire to see the frequency of needle stick injuries in paramedical staff and find out the cause of injury and their knowledge about the post exposure care and frequency of reporting to the hospital administration regarding the exposure

Study design: Observational study

Result: A total of 200 health care workers were interviewed on the surgical floor of Mayo hospital with males 60% and females 40%. The average number of needle stick injuries during the past one year was 1.7 to 3.3 in different groups. Sweepers had the highest seroconversion rates for Hepatitis B & C. None of the subjects contracted HIV /AIDS with only 15% benign reported.

Conclusion: There is an urgent need to educate the medical and paramedical staff regarding the effects of transmission of disease and risk of needle stick injuries and ways to prevent them.

Keywords: needle stick; health care workers; hepatitis C; transmissible diseases; post exposure prophylaxis.

INTRODUCTION

Needle stick injury is one of the most important risk factor for the contraction of highly infectious transmissible diseases. Our region suffers one of the highest rates in hepatitis B and C. Medical as well as the paramedical staff is at risk of receiving these injuries. More so the paramedical staff is often illiterate and unaware of the risk of getting infected. These workers do not follow the hospital policy and guidelines for dealing with sharps. The infectivity of blood on the needle causing the injury is also often not known. The risk for transmission of HIV, HCV and HBV due to contaminated blood to health care workers (HCW) are 0.3%¹, 3% (HBeAg negative) to 30% (HBeAg positive)² and 0.6 – 6%^{3,4} respectively. World Health Organization (WHO) in an estimate reported a world wide load of 66,000 health care workers will contract hepatitis C in the year 2000 and result in mortality as high as 187 people due to such specific accidents.

There is lack of awareness regarding the transmissible diseases in the paramedical staff specially sweepers; ward boys; OT assistants and trainee nurses. In our study we desire to see the frequency of needle stick injuries in these subgroups of paramedical staff and find out the cause of injury

and their knowledge about the post exposure care and frequency of reporting to the hospital administration regarding the exposure. We also determined the rate of seroconversion in this population over the next one year.

MATERIAL AND METHODS

Our study was carried out in Mayo hospital Lahore from October 2008 to December 2008. A retrospective observational study was designed. All paramedical staff including trainee nurses, operation theatre assistants, ward boys and sweepers from the surgical floor and emergency and elective operation theatre were included in the study. Interviews were done of all the health care workers and a questionnaire was filled by the authors in person to remove interobserver bias and included number of times subjects were pricked, mode of getting pricked and shape (blunt or hollow) of needle in the last one year were recorded. Frequency of seroconversion for hepatitis C & B to determine the frequency of affected subjects. As all the candidates at the time of their induction into the medical profession were confirmed to be free of any transmissible diseases, it is presumed that post exposure seroconversion is because of the needle stick injury succumbed during the job. Frequency of subjects with post exposure prophylaxis (PEP) was also calculated.

Department of Surgery, King Edward Medical University/Mayo Hospital, Lahore

Correspondence to Dr. Ahmad Uzair Qureshi, Senior Registrar
Email: Ahmed_uzairq@hotmail.com 0314-4001410

RESULT

A total of 200 health care workers were interviewed including ward boys (57), sweepers (85), operation theatre assistants (23) and Emergency trainee nurses (35). The sample included males 60% (n=120/200) and females 40% (n=80/120). The age ranges from 15 to 59 years with a mean age of 31 years. Average number of needle stick injuries during

the past one year, alongwith number of patients contracting hepatitis C and B are given in Table 1. The study shows a significant conversion rate for hepatitis C in our study ($p < 0.001$).

There was no history of blood transfusions or surgery in any of the subjects under study to reduce the chance of contracting any of these diseases from external source.

Table 1: Frequency distribution for various groups in study

	n = 200 (%)	Frequency Of Needle Stick Injuries	Number Of Case With Positive Anti HCV	Number of cases with positive HBeAg
OTA	23 (11.5%)	2.9	1(4.35%)	1(4.35%)
Nurses	35 (17.5%)	2.3	0	1 (2.86%)
Sweepers	85 (42.5%)	3.3	2 (2.35%)	3 (3.53%)
Ward boys	57(28.5%)	1.7	1 (1.75%)	1 (1.75%)
Total	200 (100)	2.6	4 (2%)	6 (3%)

None of the subjects contracted HIV /AIDS. Workers reported hollow needles as the major source (81%) of injury while working in theatre as well ward environment while in 17% of incidents took place due to blunt /cutting suture needles and in 2% the shape of needle was not known. Among those affected only 31 (15.5%) patients reported the incident to their seniors while none reported to hospital administration.

DISCUSSION

Needle stick injuries pose a major threat to the health care workers especially in third world countries due to various factors. The large incidence of unaccounted disease in an overcrowded society with meager resources to cope with essential needs is mainly responsible to lack of policy development and implementation.

World Health organization estimated a total of 9 million life years lost due to unsafe injections administration from 2000 to 2030⁵. Due to young age at contraction of disease there is several time higher the risk of developing chronic carrier stages and more risk of developing decompensated liver failures and prolonged medical illness⁶.

The majority of the subjects were males (60%) in their reproductive age group with the implication that injury with infected needle can result in major financial constraints and poor outcomes in the low socioeconomic societies.⁷

The most common community effected in medical staff excluding surgeons and physicians were the sweepers who were not aware of the risk posed by sharps infected with transmissible diseases. The major incident in the injury were disposing sharps in sweepers while capping the used

needles was responsible for incidents in all the other health care workers (HCW).^{8,9}

Though early prophylactic treatment in HIV injuries have proven of benefit⁶ but to date in our community HIV remains to be a rare transmissible disease among the health care workers at least and the main burden is of HCV for which still no proven postexposure prophylaxis is available.

After getting infected there is no evidence of transmission of these diseases to patients. Various studies have recommended some restraint in involvement with high exposure cases however there are no standardized guidelines anywhere to be implemented¹⁰.

Various Needle protective devices, such as needle-free intravenous access systems, safety needles and safety peripheral vascular cannulas are in use in the modern world for considerable period of time and in a review by Tuna et al in 2006 showed major reduction in the rate of needle stick injuries (range 22% to 100%)¹¹. Various other devices and modification in older needle protective devices are coming into practice to reduce the economic burden of these devices. Studies has shown significant reduction in the number of injuries by regular use of these items in general practice.¹²

CONCLUSION

Transmissible diseases are a major cause of early deaths in the third world countries and unawareness, illiteracy and lack of proper implementation of policies and absence of guidelines appropriate for the local social environment leads to raised frequency of seroconversions. Health care workers dealing with sharps are the most high risk groups in the hospital environment on the surgical floor. There is need for awareness campaigns at the level of each hospital

for the high risk groups patients to reduce the needle stick injuries and increase the understanding of risks associated with transmission of blood borne diseases in young productive population.

REFERENCES

1. CDC Cooperative Needlestick Surveillance Group. Surveillance of HIV infection and zidovudine use among healthcare workers after occupational exposure to HIV-infected blood. *Ann Intern Med* 1993;118:913-9.
2. Stevens AB, Coyle PV. Hepatitis C virus: an important occupational hazard? *Occup Med* 2000; 50: 377- 82.
3. Gerberding JL. Management of occupational exposures to blood-borne viruses. *N Engl J Med* 1995; 332: 441- 51.
4. Lee R. Occupational transmission of blood borne diseases to healthcare workers in developing countries: meeting the challenges. *Journal of Hospital Infection* 2009; 1-7.
5. Safety to injections. World Health Organization [address on homepage], Secretariat of the Safe Injection Global Network, Switzerland 2004. [cited June 15, 2009] Available from: http://www.who.int/injection_safety/about/resources/en/QuestionAndAnswersInjectionSafety.pdf
6. Gupta A, Anand S, Sastry J, Krisagar et al. High risk for occupational exposure to HIV and utilization of post-exposure prophylaxis in a teaching hospital in Pune, India. *BMC Infectious Diseases* 2008, 8:142.
7. Mehta A, Rodrigues C, Ghag S, Bavi P, Shenai S, Dastur F: Needlestick injuries in a tertiary care centre in Mumbai, India. *J Hosp Infect* 2005, 60: 368-73.
8. Talaat M, Kandeel A, El-Shoubary W, Bodenschatz C, Khairy I, Oun S, Mahoney FJ: Occupational exposure to needlestick injuries and hepatitis B vaccination coverage among health care workers in Egypt. *Am J Infect Control* 2003, 31:469-74.
9. Puro V, Francisci D, Sighinolfi L, Civljak R, Belfiori B, Deparis P et al. Benefits of a rapid HIV test for evaluation of the source patient after occupational exposure of healthcare workers. *J Hosp Infect* 2004, 57(2):179-182.
10. Raggam RB, et al. Health care worker-to-patient transmission of hepatitis C virus in the health care setting: Many questions and few answers. *J Clin Virol* 2009 [ahead of print]
11. Tuma S, Sepkowitz KA. Efficacy of safety-engineered device implementation in the prevention of percutaneous injuries:a review of published studies. *Clin Infect Dis* 2006;42: 1159 -70.
12. Adams D, Elliott TSJ. Impact of safety needle devices on occupationally acquired needlestick injuries:a four-year prospective study. *Journal of Hospital Infection* 2006: 64, 50-5.