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Original Article

Knowledge, attitude and practices among health care workers on needle-stick injuries

Gurubacharya DL[1], KC Mathura[2], Karki DB[3]

[1]Lecturer, [2]Associate professor, [3]Professor and Head, Department of Medicine, Kathmandu Medical College and Teaching Hospital

Abstract

Objective: This study aimed to assess the knowledge, attitude and practices among health care workers on needle stick injuries. ***Methods:*** A 15-item questionnaire was administered to seventy health care workers including nurses and paramedical staffs from different departments of Kathmandu Medical College and Teaching Hospital to measure knowledge, attitude and practices on needle stick injuries. ***Results*:** Results showed that 4% and 61% of health care workers, respectively, were unaware of the fact that hepatitis B and hepatitis C can be transmitted by needle-stick injuries. 52 subjects (74%) had a history of needle-stick injuries and only 21% reported the injuries to the hospital authority. Only 23% were in the habit of using gloves for phlebotomy procedures all the time. 79% were of the impression that needle should be recapped after use. Only 66% were aware of Universal Precaution Guidelines. 16 subjects (23%) were negative for HBsAg, Anti-HCV and Anti-HIV and 54 subjects (77%) do not know about their immune status. 42 subjects (60%) had been vaccinated against hepatitis B, while 28 subjects (40%) were not vaccinated against hepatitis B. Only 6 subjects (14%) had been tested for Anti-HBs antibody after hepatitis B vaccination. ***Conclusion*-** The survey revealed that knowledge of health care workers about the risk associated with needle-stick injuries and use of preventive measures was inadequate. A standing order procedure (SOP) should be formulated regarding needle-stick injuries in all the health institutions. It should outline precautions to be taken when dealing with blood and body fluids. It should also contain reporting of all needle-stick injuries. Health care workers should be made aware of hazards, preventive measures and post-exposure prophylaxis to needle-stick injuries. A hospital-wide hepatitis immunization programme should also be started.

Keywords: needle-stick injury, universal precaution guidelines

Health care workers who have occupational exposure to blood are at increased risk for acquiring blood-borne infections. The level of risk depends on the number of patients with that infection in the health care facility and the precautions the health care workers observe while dealing these patients. There are more than 20 blood-borne diseases, but those of primary significance to health care workers are hepatitis due to either the hepatitis B virus (HBV) or hepatitis C virus (HCV) and acquired immunodeficiency syndrome (AIDS) due to human immunodeficiency virus (HIV)[1]. The prevalence of HBsAg in healthy blood donors in Kathmandu Valley has been reported to be about 1.67%[2]. Seroprevalence study suggests that the overall anti-HCV positivity in blood donors is about 0.3% in Nepal[3]. The prevalence of HIV sero-positivity in healthy blood donors has been reported to be about 0.2% in Nepal[4]. These figures suggest that a sizable number of individuals are a potential risk for transmission of blood-borne diseases to doctors, laboratory technicians, blood bank workers, nurses, personnel working in renal dialysis units, and other health care workers. The aim of our study was to assess the knowledge, attitude and practices among health care workers on needle-stick injuries.

Subjects and Methods

This study was carried out at 500-bed Kathmandu Medical College and Teaching Hospital in May 2003. This hospital is a tertiary care referral hospital. Total of 70 nurses and paramedical staffs from different departments of the hospital were surveyed. These health care workers are normally directly exposed to blood products and needle-stick injuries while dealing with patients. Data collection was carried out using a standardized questionnaire. The respondents were given a briefing on the aims of the study, and were asked not to disclose their identity to assure them that this survey was only for academic

Correspondence
Dr. Dipesh L. Gurubacharya
P.O. BOX 7314, GPO, Kathmandu, Nepal
Email: dipeshlal@hotmail.com

purposes. A researcher was present during the survey administration to answer queries raised by respondents. The survey was conducted in two batches so that the maximum number of health care personnel working in the hospital could participate. The first part of the questionnaire contained information on demographic data, job category, HBsAg, anti-HCV and HIV status of the health care workers. The second part was on the knowledge and use of preventive measures regarding needle-stick injuries. There was no written standing order procedure (SOP) regarding needle-stick injuries in the hospital at the time of the survey.

Results

Table 1 shows some demographic characteristics of the studied health care workers.

Table 1. Demographic characteristics of health care workers.

Demographic characteristics	Number (%)
Sex	
Male	11(16%)
Female	59(84%)
Age (years)	
20-30	56(80%)
30-40	11(16%)
40-50	3(4%)
Job category	
Nurses	57(81%)
Laboratory technicians	9(13%)
Operation theatre assistants	2(3%)
Dental technicians	2(3%)
Duration as health care workers (in years)	
<5	54(77%)
6-10	6(8%)
10-15	4(6%)
16-20	4(6%)
>20	2(3%)
Immune status (HBsAg, Anti-HCV, Anti-HIV)	
Negative	16(23%)
Do not know	54(77%)
Hepatitis B vaccination	
Done	42(60%)
Not done	28(40%)
Anti HBs antibodies after HB vaccination	
Checked	6(14%)
Not checked	36(86%)

Of the 70 health care workers 59(84%) were females, 67(96%) were aged between 20-40 years, and 57(81%) were nurses in the wards. 54 subjects (77%) had been working as health care workers for less than 5 years. 16 subjects(23%) were negative for HBsAg, Anti-HCV and Anti-HIV. This was confirmed from their medical record. Also, 42 subjects (60%) had been vaccinated against hepatitis B, while 28(40%) were not vaccinated against hepatitis B. Of the 42 subjects only 6(14%) had been tested for anti-HBs antibodies after hepatitis B vaccination to check their response.

Table 2 shows the level of knowledge and preventive measures taken by health care workers regarding needle-stick injuries.

Table 2. Knowledge, attitude and practice of health care workers of biological hazards and preventive measures regarding needle-stick injuries.

Occupational hazards and preventive measures	Number (%)
Which diseases are transmitted by needle stick injury (NSI)?	
Hepatitis B	67(96%)
Hepatitis C	27(39%)
HIV/AIDS	70(100%)
Did you ever have NSI?	
Yes	52(74%)
No	18(26%)
What is the frequency of NSI per year?	
1-2	27(52%)
3-4	12(23%)
5-6	13(25%)
Have you reported the incident of NSI?	
Yes	11(21%)
No	41(79%)
Do you use gloves for phlebotomy procedures?	
Yes, all the time	16(23%)
Yes, occasionally	43(61%)
Not at all	11(16%)
Should needle be recapped/bent after use?	
Yes	55(79%)
No	15(21%)
Do you know about Universal Precaution Guidelines?	
Yes	46(66%)
No	24(34%)
Do you know about needleless safety devices?	
Yes	0(0%)
No	70(100%)

Our study showed that 4% and 61% of the health care workers, respectively, were unaware of the fact that hepatitis B and hepatitis C can be transmitted by needle-stick injury. 52 subjects (74%) out of 70 had a history of needle-stick injury and of those, 27(52%) had 1-2 pricks per year. Only 11 subjects (21%) reported the injuries to the hospital authority, and only 23% were in the habit of using gloves regularly for phlebotomy procedures. 55(79%) were of the impression that needles should be recapped after use, and only 46(66%) were aware of Universal Precaution Guidelines, while no one had adequate knowledge of new needle devices and the safety features.

Discussion

In this study, the 70 nurses and paramedical staffs who participated were aware of the fact that HIV/AIDS can be transmitted by needle-stick injury, but 4% and 61% of health care workers, respectively, were not aware that both hepatitis B and hepatitis C can also be transmitted by needle-stick injuries. A study from UK quoted the risk associated with transmission of HBV to a non-immune health care workers to range from 2% if the source patient is hepatitis B e antigen (HBeAg) negative to 40% if the patient hepatitis B e antigen (HBeAg) positive[5]. Prospective studies of health care workers exposed to HCV through a needle-stick or other percutaneous injury have found that the incidence of anti-HCV sero-conversion averages 1.8% (range 0%-7%) per injury[6]. One study reported that transmission occurred only from hollow-bore needles as compared with other sharp objects[7]. A data combined from more than 20 prospective studies worldwide of health care workers exposed to HIV-infected blood through percutaneous injury revealed an average transmission rate of 0.3% per injury[8].

Of the 52(74%) health care workers with a history of needle stick injuries, 41(79%) never reported the incident to hospital authority to get post-exposure treatment because they were not aware of the importance of post-exposure prophylaxis. In the US, 800,000 of the approximately 5.6 million health care workers suffer needle-stick injuries each year[9]. Data from EPINet system suggest that at an average hospital, workers incur approximately 30 needle-stick injuries per 100 beds per year[10]. About 80% of HCV positive surgical operation room personnel in a hospital in Pakistan had more than four needle-stick injuries per year in five years[11]. It is believed that only one out of three needle-stick injuries are reported in the US, while these injuries virtually go undocumented in many developing countries[12].

The incidence of infection with HBV has declined in health care workers in recent years largely due to the widespread immunization with hepatitis B vaccine[13]. In many health facilities, even though the personnel are vaccinated, the sero-conversion status after vaccination is not assessed. We had a similar finding in our survey where only 6 workers (14%) had been tested for Anti-HBs. In one study, about 3% of subjects were found to be negative for anti-HBs after vaccination[14]. The Centre for Disease Control (CDC) recommendation is to test for antibody after completion of three injections of HBV vaccine, and if negative, give a second three-dose vaccine and test again for anti-HBsAg antibodies. If there is no antibody response, no further vaccination is recommended. If an employee has a blood exposure to a patient known or suspected to be at high risk of HBsAg sero-positivity, he should be given HBIG 2 (one month apart) or HBIG and initiate revaccination. Personnel in chronic renal dialysis centers who do not respond to vaccine should be screened every 6 months for Anti-HBs and HBsAg[15].

The circumstances leading to needle-stick injury depend partly on the type and design of the device and certain work practices. This survey revealed that only 16 subjects (23%) were using gloves for phlebotomy procedures all the time while 43(61%) were doing so only occasionally.

It is documented that 10%-25% injuries occurred while recapping a used needles[16]. The recapping of needles has been prohibited under the Occupational Safety and Health Administration (OSHA) blood-borne pathogen standard[17]. In our study 55(79%) were of the impression that needle should be recapped after use. In 1985, in order to increase awareness among health care workers of the dangers of sharp injuries and other types of disease transmission, the Centre for Disease Control (CDC) and the Occupational Safety and Health Administration (OSHA) in the United States introduced the "Universal Precaution Guidelines", which have been the worldwide standard in both hospital and community care settings[18]. In the present survey, only 46 workers (66%) were aware of the Universal Precaution Guidelines.

An increasing number and variety of needle devices with safety features are now available. Needleless or protected needle IV systems have decreased the incidence of needle-stick injuries by 62%-88%[19]. Health care workers can help the employer in the selection and evaluation of such devices. In the present study none of the health care workers knew about new needleless safety devices.

This survey revealed that knowledge of health care workers about the risk associated with needle-stick injuries and use of preventive measures was inadequate. A standing order procedure (SOP) should be formulated regarding needle-stick injuries in all health institutions after this survey. It should outline precautions to be taken when dealing with blood and body fluids. It should also contain reporting of all needle-stick injuries. Health care workers should be made aware of hazards, preventive measures and post-exposure prophylaxis to needle-stick injuries. A hospital-wide hepatitis immunization programme should also be started.

References

1. Calver J. Occupational Health Services. Am J Infect Control 1997; 25: 363-5.
2. Singh R, Thapa GT. Incidence of Hepatitis B in the Blood Donors. J Inst Med 1985; 7: 115.
3. Singh R. Prevalence of hepatitis-C in Blood Donors- A Pilot Study. J Nepal Med Assoc 1991; 30: 1-6.
4. Source: USAID Country Profile of Nepal, December 2002.
5. Gerberding JL. Management of occupation exposures to blood borne viruses. N Engl J Med 1995:332; 444-51.
6. Manian FA. Hepatitis C after needle stick injuries. Ann Intern Med 1992; 116:345-6.
7. Puro V, Petrosilla N, Ippolito G. Italian Study Group on Occupation Risk of HIV and other Blood-borne Infections. Risks of hepatitis C seroconversion after occupational exposure in health care workers. Am J Infect Control 1995; 23: 273-7.
8. Gerberding JL. Incidence and prevalence of human immunodeficiency virus, hepatitis B virus, hepatitis C virus and cytomegalovirus virus among health car personnel at a risk of blood exposure: a final report from a longitudinal study. J Infect Dis 1994; 170:1410-7.
9. Hanrahan A, Reutter L. A critical review of literature on sharp injuries: epidemiology, management of exposures and prevention. J Adv Nurs 1997; 25: 144-54.
10. EPINet. Exposure Prevention Information Network data reports. University of Virginia: International Health Care Worker Safety Center.
11. Mujeeb AS, Khatri Y, Khanani R. Frequency of parenteral exposure and seroprevalence of HBV, HCV and HIV among operation room personnel. J Hosp Infect 1998; 38: 133-7.
12. Roy E, Robillard P. Under-reporting of accidental exposures to blood and other body fluids in health care setting: an alarming situation. Adv Exposure Prev 1995; 14: 11-3.
13. Poole CJM, Miller S, Fillingham G. Immunity to hepatitis B among health care workers performing exposure-prone procedures. BMJ 1994; 309: 94-5.
14. Barone P, Sciacca A, Lupo F, Leonardi S, Murumeci S. Hepatitis B vaccination in young nurses of a general hospital. Ann Ig 1995; 7: 251-5.
15. Centers for Disease Control and Prevention. Recommendations for post-exposure prophylaxis (PEP) for exposure to HBV, HCV and HIV. MMWR 2001; 50: 22.
16. Ruben FL, Norden CW, Rockwell K, Hruska. Epidemiology of accidental needle puncture wounds in hospital workers. Am J Ed Sci 1983; 286: 26-30.
17. Occupational safety and Health Administration: final rule on occupational exposure to blood borne pathogens. 56 Fed Reg. 64004 (1991).
18. Centers for Disease Control. Perspective in disease prevention and health promotion update. Universal precautions for prevention of transmission of HIV, HBV and other blood-borne pathogens in health care settings. MMWR 1988; 37:24.
19. Yassi A, McGill ML, Khokhar JB. Efficacy and cost effectiveness of a needleless intravenous access system. Am J infect Control 1995; 23: 57-64.

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