

KNOWLEDGE, ATTITUDE AND PRACTICES AMONG HEALTH CARE WORKERS ON NEEDLE-STICK INJURIES

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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 Saudi Arabia ranges from 2.7% to 9.8%.²⁻³ Sero-prevalence studies suggest that the overall anti-HCV positivity is about 3.5% to 5%.⁴⁻⁵ Thalassemia and sickle cell disease are common in Saudi Arabia and prevalence of hepatitis C virus antibodies among this high-risk group is about 40%.⁶ The prevalence of HIV sero-positivity has been reported to be about 0.09% in the Kingdom.⁷ 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 and transplant units, and other health care workers. The aim of our study was to assess the knowledge, and attitude among health care workers on needle stick injuries.

Subjects and Methods

This study was carried out at the 100-bed Armed Forces Hospital, Sharourah, in January 2002. This hospital provides medical services to army personnel and their families serving in the area. Of a total of 104 health care workers, 70 nurses and paramedical staff (67%) from different departments/wards of the hospital were surveyed. These health care workers are normally directly exposed to blood products and needle-stick injuries while dealing with patients. Of the 36 Saudi health care workers, only seven (19.5%) were able to participate in the study. Data

TABLE 1. *Demographic characteristics of health care workers.*

Demographic characteristics	Number(%)
Nationality	
Filipino	40 (57%)
Pakistani	11 (16%)
Saudi	7 (10%)
Indian	5 (7%)
Egyptian	3 (4%)
Jordanian	2 (3%)
Syrian	2 (3%)
Age (years)	
20-30	5 (7%)
30-40	35 (50%)
40-50	30 (43%)
Sex	
Male	23 (33%)
Female	47 (67%)
Job category	
Nurses	46 (66%)
Laboratory technicians	10 (14%)
Operation theater assistants	7 (10%)
Dental technicians	5 (7%)
Vaccinators	2 (3%)
Duration as health care worker (in years)	
<5	10 (14%)
6-10	12 (17%)
10-15	18 (26%)
16-20	30 (43%)
Stay in Saudi Arabia (in years)	
<1	5 (7%)
1-5	27 (39%)
5-10	26 (37%)
>10	12 (17%)
Immune status (HbsAg, Anti-HCV, Anti-HIV)	
Positive	Nil
Negative	70 (100%)
Do not know	Nil
Hepatitis B vaccination	
Done	59 (84%)
Not done	11 (16%)
Anti HBs antibodies after HB vaccination	
Checked	6 (10%)
Not checked	53 (90%)

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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 purposes. A researcher was present during the survey administration to answer queries raised by respondents. The survey was conducted in two batches on two days 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 worker. 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. Data was entered and analyzed using the EpiInfo-version 6 statistical package.

Results

Table 1 shows some demographic characteristics of the studied health care workers. Of the 70 health care workers 47 (67%) were females, 65 (93%) were aged between 30 to 50 years (mean 38.7 ± 6.6 years), and 46 (66%) were nurses in the wards. Forty-eight (69%) of the subjects had been working as health care workers for 10-20 years, and 54% have been working in Saudi Arabia for 5-10 years. All the subjects were negative for HBsAg, anti-HCV and anti-HIV. This was confirmed from their medical record. Also, 59 subjects (84%) had been vaccinated against hepatitis B, while 11 (16%) had neither been vaccinated or investigated for immunity to past exposure. Of the 59 subjects, only 6 (10%) 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. Our study showed that 21% and 30% of the health care workers, respectively, were unaware of the fact that AIDS and hepatitis C can be transmitted by needle-stick injury. Fifty-two subjects (74%) out of 70 had a history of needle stick injury and of those, 34 (67%) had 1-2 pricks per year. Only 4 subjects (7%) reported the injuries to doctors to get post-exposure treatment, and only 27% of were in the habit of using gloves regularly for phlebotomy procedures. Twenty subjects (29%) were of the impression that needles should be recapped after use, and only 43 (61%) were aware of universal precaution guidelines, while only 50% of subjects had adequate knowledge of new needle devices and the safety features.

Discussion

In this study, the 70 nurses and paramedical staff who participated were aware of the fact that hepatitis B can be transmitted by needle-stick injury, but over 20% were not aware that both hepatitis C and HIV can also be transmitted by needle-stick injuries. A study from UK quoted the risk

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	70 (100%)
Hepatitis C	49 (70%)
AIDS	55 (79%)
Did you ever have NSI?	
Yes	52 (74%)
No	18 (26%)
What is the frequency of NSI per year?	
1-2	35 (67%)
3-4	15 (29%)
5-6	2 (4%)
Have you reported the incident of NSI?	
Yes	4 (8%)
No	48 (92%)
Do you use gloves for phlebotomy procedures?	
Yes, all the time	19 (27%)
Yes, occasionally	48 (69%)
Not at all	3 (4%)
Should needle be recapped/bent after use?	
Yes	20 (29%)
No	50 (71%)
Do you know about the Universal Precaution Guidelines	
Yes	43 (61%)
No	27 (39%)
Do you know about needleless safety devices?	
Yes	35 (50%)
No	35 (50%)

associated with transmission of HBV to a non-immune health care worker to range from 2% if the source patient is Hepatitis Be antigen negative to 40% if the patient is positive.⁸ 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.⁹ One study reported that transmission occurred only from hollow-bore needles as compared with other sharp objects.¹⁰ 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.¹¹

Of the 52 (74%) health care workers with a history of needle stick injuries, 48 (93%) never reported the incident to a doctor 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.¹² Data from the EPINet system suggest that at an average hospital, workers incur approximately 30 needle-stick injuries per 100 beds per year.¹³ 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.¹⁴ 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.¹⁵

The incidence of infection with HBV has declined in health care workers in recent years largely due to the widespread immunization with hepatitis Be vaccine.¹⁶ In many health facilities, even though the personnel are vaccinated, the seroconversion status after vaccination is not assessed. We had a similar finding in our survey where only 6 workers (10%) had been tested for anti-HBs. In one study, about 3% of subjects were found to be negative for anti-HBs after vaccination.¹⁷ The 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 HBIGx2 (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.¹⁸

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 19 subjects (27%) were using gloves for phlebotomy procedures all the time while 48 (69%) were doing so only occasionally.

It is documented that 10%-25% injuries occurred while recapping a used needle.¹⁹ The recapping of needles has been prohibited under the Occupation Safety and Health Administration (OSHA) blood-borne pathogen standard.²⁰ In 1985, in order to increase awareness among health care workers of the dangers of sharp injuries and other types of disease transmission, the Centers for Disease Control (CDC) and the Occupational Safety and Health Administration (OSHA) in the United States introduced the "Universal Precaution Guidelines," which have become the worldwide standard in both hospital and community care settings.²¹ In the present survey, only 43 workers (61%) 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%.²² Health care worker can help the employer in the selection and evaluation of such devices. In the present study only 50% of workers knew about new needleless safety devices.

This survey revealed that knowledge of health care workers about the risks associated with needle-stick injuries and use of preventive measures was inadequate. A standing order procedure (SOP) has been formulated regarding needle stick injuries in our hospital after this survey. It outlines precautions to be taken when dealing with blood

and body fluids. It also contains reporting procedures and management of all needle-stick injuries. Educational talks were given to health care workers on hazards, prevention and post-exposure prophylaxis to needle-stick injuries. A hospital-wide hepatitis immunization program has also been started.

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