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Attitude, reporting behavior and practice of occupational needle stick injuries among hospital healthcare workers in Kashmir: a cross-sectional study

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Introduction

Health care workers are exposed variety of threats while performing their duties. This occupational exposure to blood increases the risk for acquiring blood-borne infections. The attribution of risk depends on the burden of patients with that infection in the health facility and the precautions the health care workers observe while dealing these patients. The burden of occupational diseases keeps on increasing and turning to be a life-threatening behavior if not dealt meticulously. There are a number of blood-borne infections, and out of them some are of prime importance to health care workers viz., hepatitis infection due to either the hepatitis B virus (HBV) or HCV (hepatitis C virus) and AIDS-acquired immunodeficiency syndrome due to HIV- human immunodeficiency virus. Needle stick and sharps injuries are one of the most critical occupational risk among health care workers (HCWs), which is extremely worrying due to the potential risk of transmitting blood borne pathogens (BBPs)[(1)]

Worldwide, around 40% of HCWs suffer from hepatitis B and C virus infection and 2.5% are affected by human immunodeficiency virus (HIV) caused by NSIs[(2)]. The prevalence of Needle Stick Injuries in the Iranian HCWs was 42.5% with a Confidence Interval of (95% CI 37–48). The prevalence of Needle Stick Injuries was 32 (20.9%) and majority of it occurred during assisting in operation theatre in a tertiary care hospital in Malaysia[(3)]. The prevalence of HBsAg in healthy blood donors in Kashmir12.7%[(4)]. Seroprevalence studies suggest that the overall anti-HCV positivity is about 0.8% (4).The prevalence of HIV seropositivity in the screened

population was found to be 0.009% Kashmir[5] These figures suggest that a significant population are at potential risk for transmission of blood-borne diseases to health care staff like doctors, laboratory technicians, nurses, blood bank workers, technicians working in renal dialysis and transplant units, and other allied professionals. The aim of our study was to assess the knowledge and attitude among health care workers on needle stick injuries.

Methodology

This study was carried out at the Government Medical College, Srinagar and associated Hospitals. This hospital provides medical services to the whole Kashmir valley. A total of 150 healthcare workers were administered the questionnaires. Around 40 questionnaires were left out as some did not return the questionnaire while others returned incomplete questionnaires. Of the 150 health care workers, only 110 (73.3%) were able to participate in the study. Among these 110 health care workers, 54(49.1%) nurses, Laboratory Technicians 29(26.4%), Operation theatre assistants 13(11.8%), dental technicians 9(8.2%) and vaccinators 5(4.5%) from different departments/wards of the hospital were surveyed. These health care workers are usually directly exposed to blood byproducts and in turn on needle-stick injuries while dealing with patients. Data collection was carried out using a standardized questionnaire for the study. The respondents were given a briefing on the aims of the study, and data collection was kept anonymous and it was made clear to them that the survey was only for academic purposes. A researcher was present during the questionnaire administration to answer queries raised by respondents. The survey was conducted in various wards of the hospital over a period of seven days so that the majority of the health care personnel working in the hospital could be enrolled in the study. The first section of the questionnaire contained information on sociodemographic variables, HBsAg, anti HCV and HIV status of the health care worker. The second part assessed the knowledge and the use of preventive measures regarding needle-stick injuries. Data was entered and analyzed using the SPSS version 25.

Results

Table 1 shows some sociodemographic characteristics of the participants. Of the 110 health care workers 58 (52.7%) were males, 93 (84.6%) were aged between 30 to 50 years and 54 (49.1%) were nurses in the wards. 34(30.9%) of the subjects had been working as health care workers for 16-20 years, and 26.4% have been working in Kashmir for 10-15 years. 95(86.4%) of the respondents were negative for HBsAg, anti-HCV and anti-HIV and only 2(1.8%) were positive who were undergoing treatment. Also, 81 subjects (73.6 %) remembered that they had been vaccinated against hepatitis B, while only 2(1.8%) respondents had undergone a booster dose. Among the respondents only 2 (1.8%) had been tested for anti-HBs antibodies.

Table1 Demographic characteristics of health care workers.

Demographic characteristics	**N (%)**
Age (years)	
20-30	17 (15.4)
30-40	37 (33.6)
40-50	56 (51.0)
Sex	
Male	58 (52.7)
Female	52 (47.3)
Job category	
Nurses	54 (49.1)
Laboratory technicians	29 (26.4)
Operation theater assistants	13 (11.8)
Dental technicians	9 (8.2)
Vaccinators	5 (4.5)
Duration as healthcare worker (in years)	
<5	22 (20.0)
6-10	25 (22.7)
10-15	29 (26.4)
16-20	34 (30.9)
Immune status (HbsAg, Anti-HCV, Anti-HIV)	
Positive	2 (1.8)
Negative	95 (86.4)
Don't know	13 (11.8)
Hepatitis B vaccination	
Undergone preliminary vaccination	81 (73.6)
Not done	29 (26.4)
Booster done*	2 (1.8)
AntiHBs antibodies after HB vaccination	
Checked	2 (1.8)
Not checked	108 (98.2)

Table 2 shows the level of knowledge and preventive measures taken by health care workers regarding needle-stick injuries. This study showed that 4.6%, 34.6% and 8.2% of the health care workers, respectively, were unaware of the fact that hepatitis B, hepatitis C and HIV-AIDS can be transmitted by needle-stick injury. 76 (69%) had a history of one to two needle stick injuries per year. Only 2 (6.3%) subjects reported the injuries to doctors to get post-exposure treatment, and only 2 (1.8%) of were in the habit of using gloves regularly for phlebotomy procedures. 31 (28.0%) were of the impression that needles should be recapped after use, and only 47 (43.0%) were aware of universal precaution guidelines, while only 13(11.8%) of subjects had adequate knowledge of new needle devices and the safety features.76(69.1%) use the hub cutter to destroy the needle regularly. If a hub cutter was not available 4/5th of the respondents use their two hands for capping the needle rather than one.

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	
Which diseases are transmitted by needle stick injury (NSI)	**N (%)**
Hepatitis B	105 (95.4)
Hepatitis C	72 (65.4)
HIV-AIDS	101 (91.8)
Did you ever have NSI?	
Yes	78(71.0)
No	32(29.0)
What is the frequency of NSI per year?	
1-2	76(69.0)
3-4	29(27.0)
5-6	5(4.0)
Have you reported the incident of NSI?	
Yes	0 (0.0)
No	110
Do you use gloves for phlebotomy procedures?	
Yes, all the time	2 (1.8)
Yes, occasionally	49(44.5)
Notat all	59(54.0)
Should needle be recapped/bent after use?	
Yes	31(28.0)
No	79(72.0)
Do you know about the Universal Precaution Guidelines	
Yes	47(43.0)
No	63(57.0)
Do you know about needle less safety devices?	
Yes	13(11.8)
No	97(88.2)
Do you use the hub cutter to discard needle?	
Yes	76(69.1)
No	34(30.9)
Should a use needle be capped with 2 hands or 1 hand (if required)	
One	23(20.9)
Two	87(79.1)

Discussion

In this study, 105(95.4%), 72(65.4%) and 101(91.8%) healthcare workers were aware of the fact that hepatitis B, Hepatitis C and HIV-AIDS can be transmitted by needle-stick injury respectively. A study from Nepal showed the prevalence of needle stick injury among health care worker as 70.3% during their working tenure and majority of the injury happened among nurses ($p<0.05$) besides other professions[6]. Another study from United Kingdom quoted the risk associated with transmission of HBV to a non-immune health care worker (HCW) to range from 2% if the source of infection/patient is Hepatitis B antigen negative to 40% if the patient is positive[7]. A study conducted in India found that among biomedical waste handlers none had received hepatitis B vaccination in the past. History of unintentional injury with sharps or needles during work was reported by 55 (68.7%). Multiple encounters were reported by 36 (45%). Though all of them washed the injured body part with water, only few used soaps to clean the part. Consultation with a doctor was sought by only 7 (12%). Most of them, 74 (92%) were not even aware of any post exposure prophylaxis (PEP) that can be had to prevent diseases after sharps injuries. They also showed ignorance about whom to approach for consultation after the injury.[8]

A study conducted in Pakistan revealed 28% doctors, 20% nurses, 64% operation theatre and 68% lab-technicians were fully immunized. Among rest 31% had no information regarding the

vaccine, around half (45%) did not consider themselves among high risk group, 15% expected management to get them vaccinated, 9% found it expensive. Bio safety practices were correctly performed by 42%. 29% performed injection safe practice, 10% aseptic rules and 19% properly sterilized equipment[9]. A study conducted in Ethiopia revealed that around 6 out of 10 injuries (58.7%) were not reported to the concerned body. The main reasons for not reporting the injuries were time constraint (35.1%), sharps which caused injury were not used on any patient (27.0%), the source patients did not have disease of their concern (20.2%), and again lack of knowledge that it should be reported (14.8%). Half of healthcare workers (HCWs) those who experienced injury had sought medical care next to self-based action[10]. Another study in United Kingdom revealed that of the respondents, 26.6 per cent reported having experienced sharps injuries. There was no statistical difference between the occurrence of sharps injuries and the grade, length of time spent in the specialty or subspecialty of respondents. Only 33.7 per cent of afflicted clinicians reported all their injuries as per local institutional policies. No seroconversions were reported.[11]

Table 2. Knowledge, attitude and practice of health care workers (HCWs) regarding biological hazards and preventive measures for needle stick injuries. Of the 52 (74.0%) health care workers had a history of needle stick injuries, 48 (93.0%) never reported the incident of NSI to a doctor to get post-exposure treatment because they were not aware at all of the importance of post-exposure prophylaxis. In the United States, 800,000 of the approximately 5.6 million health care workers suffer needle stick injuries each year.[12] Another study conducted in Tanzania, reflected that majority of healthcare workers trained on post exposure prophylaxis (PEP) procedure and use of personal protective equipment (PPE) were clinicians (87.1% and 71.4% respectively) and nurses (81.8% and 74.6% respectively). Around one-fourth of the healthcare workers were not aware of whom to contact in the event of occupational exposure. Around one third of healthcare workers (HCWs) did not have comprehensive knowledge on causes of occupational HIV transmission and did not have knowledge about when post exposure prophylaxis is indicated.[13]

Data from the EPIN et system infers that at an avg hospital, workers incur approximately 33 needle-stick injuries per 100 beds per year.[14] Around 33% of them were doctors followed by Nurses at 32.9%. The situation leading to needle-stick injury depend partially on the type and design of the device and certain work practices. Around 1/4th cause of injury was due to a suture needle followed by a disposable syringe. Of the injured 63.1% got themselves pricked on the left hand. Of the people injured 3/5th suffered from superficial or no bleeding. Majority of the workers were right handed 91.1%.[14]. 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. A study conducted in Rwanda showed that the anti-HBs titers were similar in the batch of participants who received two doses and those who received three doses of the HBV vaccination. Their findings provide a basis for testing for anti-HBs in all HCWs post vaccination in Rwanda.[15]

Post-HBsAg vaccination immunity to hepatitis B was 96.5% in HCW and was similar to that of global rates. Progressing age, time period, smoking habits, and overweight were associated with decreased immunity was reported by Basireddy et al in India.[16]. The CDC recommendation is to test for antibody titerafter completion of three injections of HBV vaccine, and if negative, a second 3-dose vaccine &then again test for anti-HBsAg antibodies. In case of absence of antibody response, no further vaccination is recommended. In case, an employee has a exposure of a blood of a patient known or suspected to be at high risk of HBsAg sero-positivity, he should be given two doses of HBIg (one month apart) or HBIgas well as initiate

revaccination. Healthcare workers working in chronic renal dialysis centers who do not respond to vaccine should be screened 6 monthly for Anti-HBs and HbsAg. There study revealed that only 19 subjects (27.0%) were using gloves for phlebotomy procedures all the time while 48 (69.0%) were doing so only occasionally. It is documented that 10.0 %-25.0% injuries occurred while recapping a needle. Therefore, recapping of needles has been prohibited under the Occupation Safety & Health Administration (OSHA) blood-borne pathogen standard.[17] In 1985, in order to increase awareness among health care workers of the hazards 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 launched the "Universal Precaution Guidelines," which have become the worldwide standard in both hospital and community care settings.[18] In the present survey, only 43 workers (61%) were aware of the universal precaution guidelines. A diverse range of needle devices with safety features are now available. Needleless or protected needle Intra-Venous systems have reduced the incidence of needle-stick injuries by 62.0 %-88.0 %.[19] Health care worker can help the employer in the selection and evaluation of such devices. In our study only 13.0% of workers were aware about new needleless safety devices. Around 69.1% of participants used hub cutters for destroying the needles after using them. Around 4/5th of respondents used two hands for capping the needle as against the Universal Precautional guidelines.

Conclusion

This study revealed that knowledge of health care workers about the risks associated with needle-stick injuries and use of preventive measures was not optimum. Various training programs have already been conducted by the Department of Community Medicine regarding safe injection practices from time to time but serious considerations need to be thought of for sensitizing the health care workers frequently and for imbibing the behavior change in them so that the Universal precautionary guidelines are implemented.

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