Research Article

KAP study on the assessment of needlestick injuries and occupational safety among health-care workers

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Abstract

Background: Health-care workers (HCWs) are at substantial risk of acquiring blood-borne infections such as HIV, hepatitis B virus (HBV), hepatitis C virus (HCV) through needlestick injuries (NSIs).

Objectives: To study the prevalence and associated factors of needlestick and sharp injuries (NSSIs) among the HCWs and to assess the level of awareness of the HCWs regarding NSSI.

Materials and Methods: This cross-sectional study was conducted during the months of April–June 2014 in a tertiary-care hospital. The HCWs comprised of senior residents, interns, nurses, and laboratory technicians. A self-administered structured questionnaire consisting of questions regarding incidence of NSIs that occurred during last 3 months, circumstances of the injury and other relevant information were collected from the participants.

Results: It was found that 64% participants experienced NSI at least once during the past 3 months. Of participants, 55% were vaccinated for hepatitis B whereas the rest were not vaccinated or did not complete the entire schedule. An NSI was experienced by 60.9% of participants during recapping of needle; 56.2% of HCW reported the incident to the infection control staff

Conclusion: In addition to very high rates of NSIs, low safety practices including inadequate vaccination coverage, unavailability of infection control guidelines, and other preventive facilities were reported in this study. Formal training by health authorities in the local area about safe practices and availability of preventive facilities should be ensured regarding NSIs among HCWs

KEY WORDS: Needlestick injuries, health-care workers

Introduction

Needlestick and sharps injuries (NSSIs) are one of the major risk factors for blood-borne infection among the health-care facilities. Among 39.5 million health-care workers (HCWs) worldwide, 3 million experience NSSIs every year.[1] They pose a considerable risk for the transmission of more than 20 kinds of blood-borne pathogens such as hepatitis B virus (HBV), hepatitis C virus (HBC), and HIV. The WHO (World Health Organization) estimated that exposure to sharps in the workplace accounts for 40% of infection with HBV and HCV and 2%–3% of HIV infections among CWs.[1]

The risk of contracting acute HCV infection due to a single prick approximates 15%. Seroconversion after a single needlestick exposure to an HBV-infected patient is estimated to be 6%–30%. The prevalence of occupational HIV is 0.3% after parenteral exposure, as opposed to 0.09% after mucosal exposure.[2,3]

Prevention of NSSIs is one of the major public health issues in India where safer sharps device or device with built-in sharp features or mechanism to effectively reduce the risk of the injuries are not widely available. An earlier study on injection practices in this country showed that more than half of the health staff who had administered injection reported one or more NSSI during the past 12 months and recapping needles using both hands.

This study aims to examine the current knowledge, attitude, and practices of HCWs regarding the use of protective strategies against exposure to blood-borne pathogens (standard isolation precautions, double gloving, and post exposure prophylaxis).

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Materials and Methods

This cross-sectional study was conducted during the months of April to June 2014 (3 months) in a tertiary-care hospital. The HCWs comprised of senior residents, interns, nurses, and laboratory technicians. Only those with minimum

Table 1: Basic characteristics of health-care workers in this study

Characteristics	Number
Sex	
Male	44
Female	56
Designation	
Senior resident	17
Intern	23
Staff nurse	55
Lab technician	5
Speciality	
General medicine	19
Surgery	31
Pediatrics	8
OBG	9
Anesthesia	5
Others	28

OBG, obstetrics and gynecology

work experience of 12 months were selected and the stratification was carried out according to job designation. The purpose of study was explained to each participant and informed written consent was obtained from them before getting enrolled. A self-administered structured questionnaire consisting of questions regarding incidence of NSSIs that occurred during the past 3 months, circumstances of the injury, what was done after the exposure, notification to concerned authority, lab investigations, and post-exposure prophylaxis was used to collect the relevant information from the participants. Factors such as work experience, cause of injury, type of procedure, and action taken following injury were also studied.

Results

Table 1 describes the basic characteristics of HCWs on this study. It can be seen that 44 men and 56 women participated in the questionnaire survey. Of the 100 participants, 40 were doctors including 17 senior residents and 23 interns; 60 were paramedical workers including 55 staff nurses and 5 lab technicians. Of all the participants, 19 were from general medicine, 31 from general surgery, 9 from OBG, 8 from pediatrics, and 5 from anesthesia; 28 persons were from orthopedics, casualty, intensive care unit, injection room, and phlebotomy section.

Table 2 describes the prevalence of NSSIs and associated risk factors. Sixty-four percent participants experienced NSSI at least once during the past 3 months. It was found that 55% participants were vaccinated for hepatitis B whereas the rest were not or did not complete the entire schedule.

Of the participants, 60.9% had an NSSI during recapping of needle whereas 26.6% had experienced an NSSI during injecting medicine or drawing blood. While performing surgery

Table 2: Response of health-care worker toward NSI and associated factors

Characteristics	N (%)
Prevalence of NSI	
Yes	64
No	36
HBV vaccination	
Yes	55
No	45
Activity during NSI	
Injecting medicine/drawing blood	17 (26.6)
Recapping needle	39 (60.9)
Doing surgery	6 (9.4)
Others	2 (3.1)
Reasons for NSI	
Heavy work	13 (20.3)
Lack of protective measures	34 (53.1)
Inattention	12 (18.7)
Tiredness	5 (7.8)
NSI informed to	
Occupational Health Officer	22 (34.4)
Infection control staff	36 (56.2)
None	6 (9.4)
Reasons for reporting	
Worried about consequences	21 (32.8)
Hospital infection control policy	13 (20.3)
To seek further investigations	24 (37.5)
Responsibility	6 (9.4)

NSI, needlestick injury.

9.4% had an NSSI, and 3.1% of participants had an NSSI while handling uncooperative patient or needle left at inappropriate place. A majority (53.1%) of HCW mentioned that lack of protective measures contributed to NSSIs; 20.3%, 18.7%, 7.8% attributed it to heavy work, inattention, and tiredness, respectively.

Among HCWs experiencing an NSSI, 56.2% reported the incident to infection control staff, 34.4% reported that to Occupational Health Officer, and 9.4% did not report that to anyone. The reasons for reporting of NSI were mainly to seek further investigation (37.5%), worry about future consequences (32.8%), hospital infection control policy (20.3%), and a sense of responsibility (9.4%).

Table 3 shows the awareness of HCWs regarding NSI. It is evident from this table that most of the doctors and nurses are quite aware of NSIs, universal precautions, and other measures to prevent NSI.

Discussion

In this study, it was found that among 64% of HCW who had an episode of NSSI during the past 3 months, 57.5%

Table 3: Awareness of health-care workers regarding the needlestick injuries

Characteristics	Doctors (*n* = 40)	Nurses (*n* = 60)
NSIs are preventable	38	54
NSI transmits infection	40	51
Hepatitis B vaccine prevents contracting hepatitis B infection	40	51
The universal precautions decreases the risk in NSI	37	55
Use of medical devices with safety feature reduces the risk of NSI	33	54

NSI, needlestick injury.

were doctors and 68.3% were staff nurses. The increased incidence of NSI in HCW is known to arise from a combination of high-risk activities with low safety measures (activities including administering injections, drawing blood, recapping needles, disposing of needles, handling trash and dirty linen, and transferring blood or body fluids from a syringe to a specimen container and missing the target).[4,5] Such behavior affects not only the quality of care delivered by the HCW but also the safety and well-being of care providers.[6]

Immunization with hepatitis B vaccine was significantly higher among resident doctors and interns as compared to staff nurses, which indicates the need for awareness about hepatitis B vaccination among the nurses. Study about the awareness and hepatitis B coverage also shows vaccination coverage more among doctors compared to nurses.[7]

In this study most of the events of NSSIs occurred while recapping a needle (61%) followed by blood collection procedures (26%) whereas 9% of injuries occurred during surgery. Several studies have shown recapping to be an important cause of NSSIs.[8–10] The recapping of needles has been prohibited under the Occupation Safety and Health Administration blood-borne pathogen standard.[7]

In this study, lack of protective measures and long working hours were positively associated with the occurrence of NSSIs, which is consistent with past studies.[11–13] This finding confirms the need for keeping adequate working hours to reduce the risk of these injuries and infection with blood-borne pathogens in Mongolia.[14]

Approximately 90% of the HCWs had reported NSI to either Occupational Health Officer or infection control staff. This finding supports the view that most of them are aware of notification and taking post-exposure prophylaxis. Askarian and Malemakan[14] found that 82% of all injuries went unreported. Lee and Hassim[15] found that only 40.8% of NSIs were reported and that the reporting rates between different categories of HCWs were significantly different.

A considerable difference between awareness among doctors and staff nurses regarding disease transmitted by NSI, hepatitis B vaccination, and universal precautions has been observed. This emphasizes the need for conducting more training programs regarding safe injection practices and universal precautions among staff nurses. Therefore, it is high time to introduce syringes and other engineered equipment with safety devices as their use in the developed world has reduced the number of NSIs significantly.

The following are some drawbacks of this study:

- The estimated incidence of NSSIs and their associated factors may be subject to reporting errors.
- This study did not evaluate the NSI among the HCWs of rural tertiary-care hospitals.
- Interventions on safety issues for health workers were not included in the survey, which remains to be investigated in future studies.

Conclusion

To conclude, we recommend that in all health-care settings, record keeping and reporting of sharp injuries should be considered as an essential part of infection control activity. Post-exposure prophylaxis and follow-up facility should be provided by the hospital management. Infection control teaching and training should be an integral part of the curriculum of all disciplines including medical and paramedical subjects.

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