

# Attitude of junior doctors towards needle-stick injuries

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## Abstract

**Background:** Needle-stick injury (NSI) is a known occupational hazard to health care workers. This study is done to estimate the prevalence of needle-stick injuries and evaluate the attitude of junior doctors towards it.

**Methods:** This is a cross sectional study carried out in April 2008. Questionnaires related to NSI were distributed amongst residents, house officers and interns currently working in various departments of Tribhuvan University Teaching Hospital. Data obtained from the completed questionnaires were analyzed with simple manual analysis using frequency and percentage.

**Results:** Hundred twenty four (83.7%) doctors had sustained NSI. Amongst those who sustained NSI, 67 (54%) doctors washed their hands with soap and water or antiseptics, 11 (8.8%) reviewed the patient's serological status, 42(33.8%) did both of the above while 4(3.2%) did nothing. Eighteen (14.5%) doctors reported the incident to hospital authority while 106(85.4%) doctors did not. Thirty six (33.9%) doctors did not report because they did not consider it important; 50(47.1) doctors did not know what to do; 12 (11.3%) thought the hospital was not concerned regarding such injuries and 8(7.5%) did not report as the patients serology was negative.

**Conclusion:** NSI is common amongst junior doctors. Washing hands with soap and water is what most doctors do following NSI. Non-reporting of NSI is high. Awareness of post exposure management following NSI is important to reduce the possible transmission of blood borne pathogens.

**Key words:** needle-stick injuries, Post exposure prophylaxis (PEP), under reporting,.

## Introduction

Needle-stick injury (NSI) is a common occupational hazard to health care workers (HCW). These include injuries from syringes, needles and other sharp objects. Any NSI puts the HCW at risk of acquiring blood borne infections. There are more than twenty blood borne infections with the most important ones being HIV, HBV and HCV .<sup>1</sup> The risk of transmission of these infections depend on the frequency of NSI and prevalence of these infections in the patient population.<sup>1,2</sup> The

incidence of transmission of HIV is 0.3%, HCV is 3% and HBV is 30% from an infected patient.<sup>1,3</sup> More than 35 million HCWs face the risk of sustaining a percutaneous injury with a contaminated sharp object every year worldwide.<sup>4</sup> Nurses are most at risk accounting for 50% of NSI incidents while doctors sustaining injury comprise of 14-15%.<sup>3</sup> The prevalence of anti-HCV positivity and HIV seropositivity in healthy blood donors has been found to be 0.3% and 0.2% respectively. HBsAg has been detected in 1.67% healthy blood donors in Kathmandu valley itself.<sup>1</sup> So, there is

## Needle-stick injuries

considerable amount of risk to HCWs even when managing an apparently healthy patient. Universal precautions (Ups) recommended by UK Department of Health in 1998 states that as it is impossible to identify all those patients who are seropositive to HIV, HBV or HCV, every patient should be regarded as a potential biohazard.<sup>2</sup> Strategies to prevent NSI include general training, education and more recently introduction of protective devices.<sup>3,4</sup> But once NSI occurs, prevention of blood borne infections depends on the action taken following such incidents.

The objective of this study is to estimate the prevalence of NSI and evaluate the attitude of junior doctors towards NSI.

## Materials and methods

This is a cross sectional study carried out at Tribhuvan University Teaching Hospital, a tertiary care centre in Kathmandu, Nepal. The study was conducted in April 2008. A self administered questionnaire method was used to collect the data. A standardized questionnaire was formulated relating to NSI and actions taken following NSI. The questionnaires were distributed amongst second year and third year residents, house officers and interns currently working in the department of Medicine, Surgery, Obstetrics and Gynecology, Orthopedics, Pediatrics, Otorhinolaryngology, Ophthalmology, Anesthesiology, Radiodiagnosis, Dermatology, Pathology, Psychiatry and Emergency. The questionnaires could not be distributed to first year residents because they had not joined the residency program when the study was conducted. The questionnaires once completed were collected.

The identity of doctors who had participated was not disclosed. Data obtained from the questionnaires was analyzed with simple manual analysis using frequency and percentage.

## Result

A total of 148 out of 218 (67.88%) doctors submitted completed questionnaires. The response amongst residents was 99/133 (74.4%), amongst house officers was 21/28 (75%) while amongst interns was 28/57(49%).

Amongst the respondents, 66.89% were residents, 14.1% were house officers while 18.9% were interns. The respondents age ranged from 23 years to 40 years with mean age of 28. There were 106 males and 42 females (Fig. 1).

Figure 1: Distribution of respondents by sex.

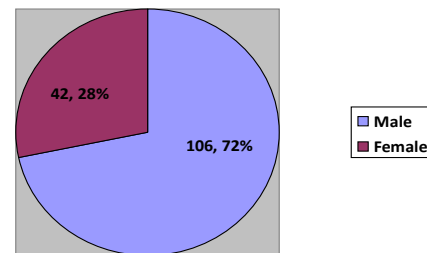
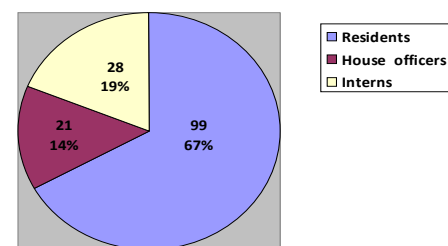


Figure 2: Distribution of respondents by designation.



Hundred twenty four (83.7%) doctors had sustained NSI while 24 (16.2%) doctors had never sustained such injury (Fig.2). Accidental prick by hypodermic needle was the commonest cause of NSI (Table 1).

Table 1. Types of instruments with which NSI was sustained (n= 124).

Instruments	Number	Percentage
Hypodermic needle	74	59.6%
Surgical needle/knife	37	29.8%
Both	13	10.4%

Amongst those who sustained NSI, 67 (54%) doctors washed their hands with soap and water or antiseptics, 11 (8.8%) reviewed the patient's serological status, 42(33.8%) did both of the above while 4(3.2%) did nothing.

Reporting the incident to the hospital authority was done by 18 (14.5%) doctors while 106(85.4%) doctors did not report. Thirty six out of 106 (33.9%) doctors did not report because they did not consider it important, 50/106 (47.1) doctors did not know what to do, 12/106 (11.3%) thought the hospital was not concerned regarding such injuries and 8/106 (7.5%) did not report as the patient's serology was negative.

Though most of the doctors considered hepatitis B vaccination to be necessary and had actually received it, only thirty out of 145 (20.68%) had checked their

vaccination status (Table 2).

Table 2: Hepatitis B vaccination status of the respondents (n=148).

Respondents who felt the need to be vaccinated.	147	99.32%
Respondents who got Hepatitis B vaccination	145	97.97%
Respondents who checked the status of Hepatitis B vaccination.	30	20.68 %

## Discussion

Needle-stick injury is a major concern amongst HCW as it continues to present a risk of occupational exposure to blood borne pathogens. Several attempts have been made to calculate the number of NSI but the rate remains unclear due to under reporting.<sup>3</sup> In our study, 124/148(83.7%) doctors had sustained NSI during their medical career.

The incident was reported to the hospital authority by 18 (14.5%) doctors while 106(85.4%) did not report. Under-reporting in the literature ranges from 26 to 90%.<sup>3</sup> The belief that the injury does not constitute a risk, unawareness of importance of post-exposure prophylaxis (PEP) or a potential subsequent restrictions in practice has been taken as some of the reasons for under-reporting.<sup>1, 3, 4, 5</sup> In our study, 33.9% doctors did not report because they did not consider it important, 47.1% doctors did not know what to do, 11.3% thought the hospital was not concerned regarding such injuries and 7.5% did not report as the patient's serology was negative.

The incidence of transmission of HIV is 0.3%, HCV is 3% and HBV is 30% from an infected patient.<sup>1,3</sup> The commonest route of transmission for these infections is percutaneous injury, especially those caused by hollow needles. The risk of transmission of HIV following hollow needle injury is approximately 0.3%, following mucosal exposure is 0.09% and from a solid needle is 0.009-0.09%.<sup>6</sup> This is so because the amount of blood transmitted is higher in hollow needle injury than in other forms of sharp injuries.<sup>7</sup>

Post exposure management includes first aid, serological testing and counseling. Immediate actions following potential exposures include thorough washing with soap and water.<sup>7,8</sup> There is no evidence that use of antiseptics for wound care or expressing fluid by squeezing the wound further reduces the risk of blood-borne pathogen

transmission; however, the use of antiseptics is not contraindicated. The application of caustic agents (e.g., bleach) or the injection of antiseptics or disinfectants into the wound is not recommended.<sup>9</sup> In this study, 109 (87.9%) doctors washed the injury site with soap and water or an antiseptics.

Post exposure prophylaxis (PEP) in the form of immunoprophylaxis and antiviral medications are used whenever indicated. Studies have shown a reduction in transmission of infection by 81% with PEP after occupational exposure.<sup>8</sup>

Serological testing of the source of sharp injury for HIV, HBV and HCV is recommended. If the source is positive for any of the three infections, the exposed HCW should be tested at the time of injury and several times later to determine whether infection develops. Those who have received 3 doses of hepatitis vaccine also have to be tested unless they have a HBV antibody test within the past 2 years. Most of the times, the infection will be evident in laboratory test by 6 months.<sup>7,8</sup>

Counseling is an important aspect of post exposure management since the emotional trauma following NSI can be severe and long lasting, especially if the source is HIV positive. Adhering to certain behavioral measures until the infection is ruled out is crucial. These include sexual abstinence or use of condoms, avoiding blood, plasma, organ and semen donation, breast feeding and pregnancy.<sup>8</sup>

At Tribhuvan University Teaching hospital, there is provision of PEP for HIV. A protocol has been devised which includes immediate management and further follow up. Immediate management includes washing the wound thoroughly with soap and water and avoid squeezing the wound or applying antiseptics and caustic agents over the wound. A stat dose of a tablet consisting of zidovudine 300mg and lamivudine 150mg and 2 capsules of indinavir 400mg are to be taken as soon as possible. Since these drugs are available in the control room, they can be obtained even during evening and night time. The exposure is then assessed the next day by the experts in the counseling OPD and PEP is started according to the severity of exposure and the status of the source.

Preventive measures need to be taken to avoid occupational transmission of these infections. In 1985, "Universal Precaution Guidelines" was introduced by the Centre for Disease Control (CDC) and Occupational Safety and Health Administration (OSHA) in the United States to create awareness amongst healthcare workers regarding the dangers of sharp injuries and disease

## Hearing results of type III tympanoplasty

transmission.<sup>1</sup> Universal precautions involve the use of protective barriers such as gloves, gowns, aprons, masks or protective eyewear, which can reduce the risk of exposure of the health care worker's skin or mucous membranes to potentially infective materials. In addition, under universal precautions, it is recommended that all health care workers take precautions to prevent injuries caused by needles, scalpels and other sharp instruments or devices. Effective training and education regarding such precautionary measures is an important aspect of prevention.<sup>8</sup>

Hepatitis B vaccination is the best method of protection against HBV infection.<sup>4</sup> The incidence of infection with HBV has declined in HCW recently following widespread immunization with hepatitis B vaccine.<sup>1</sup> In our study, 145 (97.97%) doctors had been vaccinated against HBV though 147(99.32%) considered it important to get vaccinated considering the high occupational risk. Only 30 (20.68%) doctors had assessed the vaccine response status of the hepatitis B vaccination. Vaccination response status should be assessed because 12-21% may not develop protective surface antibodies.<sup>10</sup> It is important to know whether a person is a responder or a non-responder as the PEP differs in these two categories.

The limitations of this study are lack of systematic sampling and self-selection of respondents. Response was received from 67.8% junior doctors only so the results obtained may not represent the attitude of all the doctors. In addition, those at risk of NSI include nursing staffs, paramedics and support staffs like attendants. So a cross sectional study including all the health care workers using a standardized questionnaire covering knowledge, attitude and practice related to NSI would give a better picture of the NSI scenario in Tribhuvan University Teaching hospital.

## Conclusion

NSI is a common occupational hazard for any HCW which also includes junior doctors. Washing hands with soap and water was commonly performed by the doctors immediately following NSI. Though NSI frequently occurs, non-reporting of NSI is high for various reasons. Awareness programs regarding post exposure management following NSI should be brought about to decrease the transmission of blood borne pathogens.

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