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Original ARTICLE

RETROSPECTIVE ANALYSIS OF NEEDLE STICK INJURIES AND THEIR MANAGEMENT AMONG HEALTH CARE WORKERS IN A TERTIARY CARE HOSPITAL

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ABSTRACT

Introduction: Needle stick injuries (NSIs) are the most common occupational hazard that a health care worker (HCW) is exposed to in the work place. The potential effects related to these injuries include risk of transmission of blood borne pathogens such as Human Immunodeficiency Virus (HIV), Hepatitis B virus, (HBV) and Hepatitis C virus (HCV) **Objective:** To know the prevalence of NSI among HCWs so that causes could be known and appropriate preventive measures could be taken. **Material & Methods:** An observational prospective study was done during a period from : August 2018 to January 2019 at Dayanand Medical College and Hospital, Ludhiana. The NSIs were observed by the ICNs and the standard NSI Proforma as prescribed by the WHO was filled by them **Results:** A total of 41 HCWs got NSI. Maximum incidence was seen among nurses (48.7%). Maximum NSIs(48.7%) occurred during Biomedical waste handling and disposal. Source was known in 34 cases and not known in 7 . Out of 34 known source cases, 22 were non reactive to base line investigations and 12 were seropositive(2 HIV positive, 3 HBs Ag positive and 7 HCV positive). **Conclusion:** This study reveals that HCWs are at higher risk of NSI. The prevalence is high among the nurses. Practice of standard precautions for infection control needs to be followed.

Key words: Needle stick injury, Health care worker, Infection control nurses

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INTRODUCTION

Needle stick injuries (NSIs) are the most common occupational hazard that a health care worker (HCW) is exposed to in the work place. NSIs are common and to an extent inevitable in health-care workers during execution of their patient care services. Percutaneous exposure occurs as a result of a break in the skin caused by a needlestick or sharps contaminated with blood or body fluids.¹ The potential effects related to these injuries include risk of transmission of blood borne pathogens such as Human Immunodeficiency Virus (HIV), Hepatitis B virus, (HBV) and Hepatitis C virus (HCV) . Blood borne infections have been recognised as an occupational hazard for nearly 50 years.² However, it is only in the last 20 years that there has been a widespread recognition of the specific risk posed to health care workers by blood borne viruses. While as many as twenty blood borne pathogens can be transmitted through

accidental needle sticks, the potentially life threatening are HIV, HBV and HCV.³ NSIs can be regarded as preventable, if health care workers adopt a comprehensive program that addresses institutional, behavioural, and device-related factors that contribute to the occurrence of needle stick injuries.⁴ There is limited data from India on the aspect of needle stick injuries. The objective of this study was to know the prevalence of NSI among HCWs so that causes could be known and appropriate preventive measures could be taken.

MATERIALS AND METHODS:

This six month observational prospective study was done during a period from : August 2018 to January 2019 at Dayanand Medical College and Hospital, Ludhiana The Needle stick injuries to the HCWs in DMCH were observed by the Infection control nurses during the defined period and the standard NSI Proforma as prescribed by the WHO was filled by them. The Proforma

contained information on the demographic characteristics of HCWs such as name, age, sex, employment number, department, vaccination record, anti hepatitis B antibody levels in the past. The base line investigations of HCWs and the source were done. For HIV, the preinformed testing was carried out after taking the consent and confidentiality was maintained. Viral markers for Hepatitis B, Hepatitis C, and HIV were tested using rapid methods and the anti hepatitis B antibody levels were checked by ELISA method. The data was collected by the ICNs and the same was analysed by Microbiologist. Regular classes as a part of study curriculum were conducted separately for each group of HCWs via interactive lectures, audio–visual aids and hands-on practice, especially among newly inducted staff. Hospital infection control nurses, clinical microbiology residents, and trained technical staff were actively involved in follow-up and counselling of each exposed HCWs in the PEP program.

RESULTS

During 6 month period, a total of 41 HCWs got NSI. The overall incidence of NSI was nearly 0.82%. Among various HCWs, maximum incidence was seen among nurses (48.7%), followed by doctors and ward attendants (17.1%), sweepers (14.6%) and technicians (9.7%). **Figure:1** Maximum NSIs (48.7%) occurred during Biomedical waste handling and disposal and rest of the NSIs occurred while doing procedures -sample collection(31.7%), RBS monitoring(12.2%), stitch suturing (7.4%). **Figure: 2** Out of 41 NSI cases, source was known in 34 of them and not known in 7 of the cases. Out of 34 known source cases, 22 were non reactive to base line investigations and 12 were seropositive. Out of these, 2 were HIV positive, 3 were HBs Ag positive and 7 were HCV positive. In 7 HCWs who got NSI from HCV positive cases, base line investigations were non reactive and LFTs were within normal limits. These were followed up upto 6 months. **Table:1.** The 3 HCWs who got pricked from HBs Ag positive source, were immunised and their anti HBs levels were >10 IU/ml. No further action was taken. In 2 HCWs who got pricked from HIV positive cases, anti retroviral therapy was started within 24hrs of the injury

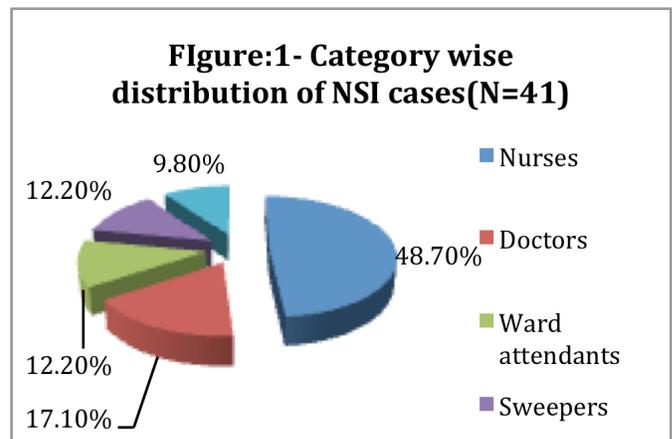
DISCUSSION

Personnel who regularly practice invasive procedures such as blood sample collection and starting intravenous lines are particularly at risk to percutaneous injuries.² Needle stick injuries present the single greatest risk to medical personnel.⁵ In our study , the maximum NSIs were seen among the nurses (48.7%) These results were similar to a study done by Rahul Sharma *et al* in Delhi.⁶ Our results were also similar to a study done by Islahi *et al* in Uttar Pradesh in which he showed that 68.4% of the total NSI were reported from Staff nurses.⁷ The results of our study were also similar to studies done by Saulat Jahan, Salekar *et al* , Singru *et al* ,and Evans *et al* .^{3,5,8,9} In a study done by Bashir and Qadri in India, majority of the health care workers who sustained needle stick injury were nurses (14.8%) followed by junior doctors (5.6%).¹⁰ Our results were in contrast to a study done by Sardesai *et al*.¹¹ Proper disposal of the sharps plays a critical role in needle stick injuries. In our study, most of needle stick injuries occurred during sharps disposal (48.7%). This is similar to the study done by Salekar *et al*.⁵ In his study, he showed that 31.7 % of the NSIs occurred during improper sharp disposal. Our results were also similar to study done by Bashir *et al*.¹⁰ Our results were

in contrast to the results of study done by Islahi *et al* in which he showed that the most common cause of NSI was during insertion of I/V cannula (30%).⁶ In our study, only 7.4% of the cases occurred during stitch suturing whereas in a study by Patric Cervini *et al* majority of injuries occurred during suturing (46%).¹² Needle stick injuries are an important and continuing cause of exposure to serious and fatal diseases among health care workers. The most common infections transmitted through NSIs include, HIV, HCV and Hepatitis B .In our study all the HCWs who were exposed to HIV positive source, started anti retroviral therapy within 24hrs of the injury. This was in contrast to a study done by Islahi *et al*⁷ in which, PEP was started in only 28% of the total HCWs exposed to HIV. Our results were also comparable to various other studies done in India.^{13,14,15} Our results were in contrast to a study done by Safari *et al* in which only 85% of the HCWs exposed to HIV took PEP.¹⁶ In our study all the HCWs were immunised with Hepatitis B vaccine. This was similar to studies done by Singhal *et al* at AIIMS, New Delhi¹⁷ and GB Pant.¹⁸ But in a study done by Islahi *et al*⁷, only 40.74 % of the HCWs were completely immunised.

CONCLUSION

This study reveals that HCWs are at higher risk of NSI. The prevalence is high among the nurses. Practice of standard precautions for infection control needs to be followed. Given the dangers of disease transmission through needle stick injuries, the surprising lack of awareness of these dangers and the correct actions to be taken post injury makes it imperative to address this issue urgently. Training in universal precautions, proper sharps disposal and action to be taken in case of injury needs to be given to all categories of health care workers. All the hospitals need to have a uniform needle stick injuries policy covering safe work practices, safe disposal of sharps, procedures in event of needle stick injury, training including pre-employment training, monitoring and evaluation of needle stick injuries and procedures for reporting needle stick injuries. Training and education on workplace safety, safe handling and disposal of sharps, provision of personal protective equipment, availability of safety engineered devices, displaying the protocol and flow chart of reporting on exposures and access to interventions are the various ways to prevent this preventable occupational hazard.



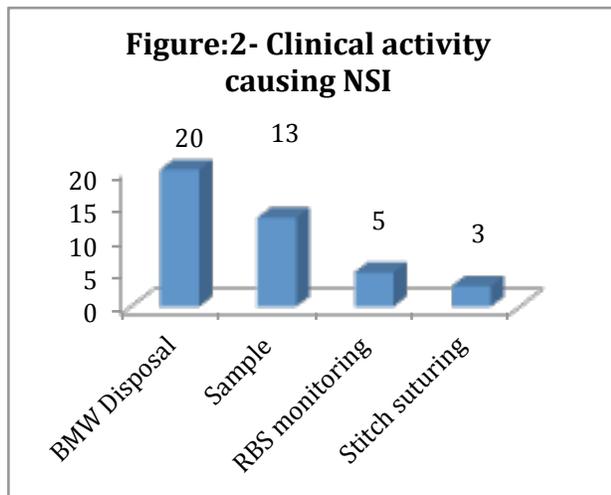


Table 1: Serostatus of the source

S No.	Serostatus of Source	No.
1.	Unknown	7
2.	Non reactive(HIV,HBsAg, Anti HCV)	22
3.	HIV Reactive	2
4.	HBs Ag Reactive	3
5.	HCV Reactive	7
6.	Total	41

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