

Prevalence of Needle Stick Injury and its Management Practices among Medical MBBS Interns: A Hospital based Cross Sectional Study from Central India

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Abstract: ***Introduction:** Tertiary care institutions are the places where patient turnover is normally high. The HCWs have high work load and are more frequently involved in procedures which can lead to needle stick injuries. Our study aimed to estimate the prevalence of needle stick injuries and assess the practices among the MBBS interns of a tertiary care teaching hospital of central India. **Method:** A cross - sectional hospital based study was conducted using google forms during November 2023. The data was analysed using Microsoft excel. **Results:** Total 145 students consented and completed the forms. Of these 57.2% (83) were males and 49.7% (72) were females. Our study found a prevalence of 46.9%. 86.9% (126) have received complete Hep B vaccination. **Conclusion:** The prevalence of needle prick injuries is very high at 46.9% which is a cause of concern. At 86.9% of complete immunization for Hep - B, the coverage is good but must strive for 100%. Proper training & knowledge is essential to prevent needle stick injuries.*

Keywords: needle stick injuries, tertiary care, MBBS interns, prevalence

1. Introduction

In the fast - paced and demanding world of healthcare, needlestick injuries represent a significant occupational hazard faced by healthcare workers worldwide. Every day, nurses, physicians, laboratory technicians, and other healthcare professionals are at risk of accidental needlestick injuries, exposing them to potential infections and bloodborne pathogens.

Needle stick injuries refer to the inadvertent introduction of blood or potentially hazardous materials into the body of healthcare providers during the course of their regular duties. These injuries typically occur when healthcare workers come into contact with hollow - bore needles or sharp instruments, such as needles, lancets, or contaminated broken glass. (1) While needlestick injuries are often considered an inevitable part of healthcare practice, they are far from benign. Beyond the immediate pain and discomfort they cause, these injuries can have serious and potentially life - threatening consequences, including the transmission of bloodborne diseases such as HIV, hepatitis B, and hepatitis C.

It's worth noting that over thirty different microorganisms have been identified as causing documented infections among healthcare workers or hospital laboratory personnel following exposure to blood or body fluids. (2)

Among the pathogens transmitted through needle stick injuries, the most significant ones include Hepatitis B virus (HBV), Hepatitis C virus (HCV), and Human

Immunodeficiency Virus (HIV). (3) The World Health Organization (WHO) defines 'a safe injection' as one that does not harm the recipient, does not expose the provider to any avoidable risk, and does not result in any waste that is dangerous to the community. Needle stick injuries have significant indirect consequences in health care delivery especially so in the developing countries, where already the qualified work force is limited with respect to the disease burden in the population. These injuries not only potentiate health consequences but also cause emotional distress in health care workers which results in missed workdays and directly affects the health care services and resources. (4)

With this background knowledge, we conducted a study to estimate the prevalence of needle stick injuries and assess the practices among the MBBS interns of a tertiary care teaching hospital of central India.

2. Methods

A cross sectional study was conducted during November 2023, 6 months after starting of the internship of 2018 MBBS Undergraduate students of a teaching hospital in central India. The study was approved by the Institutional ethics committee of GMC Nagpur.

Inclusion criteria: All MBBS interns of 2018 batch of the institute who have completed 6 months of internship and gave consent for the study.

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Sample size calculation:

There were 200 students who were admitted in 2018 batch. Assuming the expected frequency of needle prick injuries to be 50% and 5% absolute precision, the sample size required was calculated to be 132. An additional 10% was added to discount for the non-response. The final sample size required was calculated to be 145.

Data was collected using a pre - designed, structured questionnaire whose validity was checked by conducting a pilot test among 20 students. The questions were self-administered using google forms.

Anonymity of the participants were maintained by not collecting their names or email id throughout the data collection process.

Statistical Analysis: The responses from the google form was downloaded in excel sheet in .csv format and converted to .xlsx format. The data was then cleaned and coded. The data was analysed using Microsoft excel. The quantitative variables were described as mean and standard deviation whereas the qualitative data was described as proportions and frequencies.

3. Results

Total 145 students consented and completed the forms. Of these 57.2% (83) were males and 49.7% (72) were females. The mean age of participants was 23.82 years ±0.85, while ranging from 22 - 26 years. Fig 1 shows that 138 participants have administered injections in any form during their internship. Of these 138, 75.4% (104) resheathed the needle after giving the injection. Also, of these 138, only 0.7% (1) did not separate needle from syringe while discarding, rest 99.3% (137) separated the needle from the syringe while discarding. Out of these 137 participants 76.6% (105) wore gloves while separating while rest 23.4% (32) removed with bare hands.

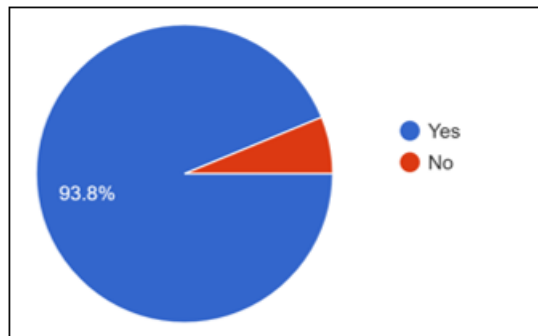


Figure 1: Subjects who have administered injection in any form during their 6 months of internship

Table 1: Prevalence of needle stick injuries among MBBS interns

Whether there were any needle pricks	Number of subjects	Percentage (%)
Yes	68	46.9
No	77	53.1
Total	145	100

46.9% (68) subjects sustained needle stick injury during their internship (Table 1). Of these 68 subjects, 50% (34) subjects sustained pricks only once, 32.4% (22) twice & 17.6 % (12) more than two times. (Figure 2) In 72.1% (49) the prick occurred due to individual carelessness/accident, 10.3% (7) due to poor disposal of needle, 10.3% (7) could not remember the cause while rest 7.4% (5) were due to other causes. (Figure 3) Most of the subjects i. e.61.8% (42) reported the incident to Junior/Senior Resident doctors, 16.2% (11) reported to CMO while another 16.2% (11) did not report at all.4.4% (3) reported to ART/ICTC centre, rest 1.4% (1) reported to the Blood transfusion officer. (Table 2) 72% (49) had the needle prick incident during weekdays, 4.4% (3) during weekends & 23.5% (16) don't remember when the incident occurred. Of the total 145 subjects, 86.9% (126) have received complete Hep B vaccination, rest have either not received or partially immunized.57.2% (83) have received training regarding prevention & treatment of needle prick injuries. Only 60.7% (88) subjects have read the hospital's Health & Safety policy on the safe and ethical disposal of clinical waste. Only

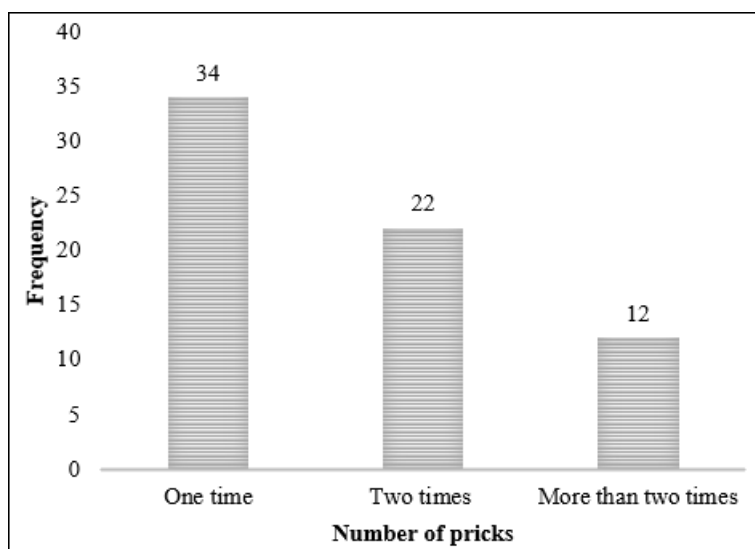


Figure 2: Frequency of pricks among those who sustained needle stick injuries (n=68)

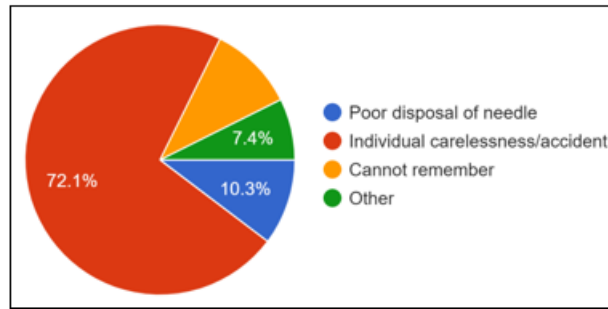


Figure 3: Distribution of subjects based on cause of the most recent needle prick (n=68)

Table 2: Distribution of subjects according to person/place of reporting of needle prick (n=68)

Person/Place where needle prick was informed/ reported	Number of subjects (n)	Percentage (%)
Junior/Senior Resident	42	61.7
CMO	11	16.2
No one	11	16.2
ICTC/ART centre	3	4.4
BTO	1	1.5
Total	68	100

4. Discussion

Our study found a prevalence of 46.9% of needle prick injuries as compared to 57.7% in a study in Palestine (5), 75.6% in a study done in Kerala (6) The difference may be due to the level of training, knowledge & workload. Our study has almost similar findings to other studies in India which found a prevalence of 47%, 47.2% among interns. (7, 8)

In our study 76.6% of subjects who were having needle prick injuries wore gloves, which is higher than a study done in Dublin which found only 26% were wearing gloves. (9)

In our study, 86.9% of subjects were completely immunized for Hep - B, which is higher than study in Mullana (Ambala, India) where only 43.1% were completely immunized, (10) but similar to another study in Nepal where 83.7% has completed full doses. (11)

5. Conclusion

The prevalence of needle prick injuries is very high at 46.9% which is a cause of concern. At 86.9% of complete immunization for Hep - B, the coverage is good but must strive for 100%. The study found various other epidemiological factors like - time of prick, training for needle stick injuries, awareness regarding hospital safety protocol etc. These factors should be studied in depth for framing rules regarding needle prick safety guidelines.

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