Knowledge and Frequency of Needle Stick Injury Among Dental Students and House Officers of Bhitai Medical and Dental College, Mirpur Khas

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ABSTRACT

Objective: To evaluate the knowledge and experience of Needle Stick Injury (NSI) among dental students and house officers at Bhitai Dental and Medical College, Mirpur Khas.

Methodology: This descriptive cross-sectional study was conducted among dental students and house officers. The number of needle stick injuries and post exposure reporting in the past 12 months was assessed by a questionnaire-based survey. SPSS 19 was used to analyze the data.

Result: A total of 330 dental students and house officers participated in this study in which 76.3% were dental students and 23.3% were house officers. As many as 63% had experienced NSI. As many as 31% reported receiving NSI during re-capping of the needles, 21% during administering local anaesthesia injection, and 19% reported getting injured during the scaling procedure. A total of 78.6% of the participants did not report the exposure incident.

Conclusion: The most prevalent of causes reported was receiving injury during the recapping of needle. The reporting of NSIs was found to be insufficient, hence evaded proper follow up because the respondents feared stigmatization and discrimination. Furthermore, awareness was low regarding the means of prevention and protocol.

Key words: Needle stick Injury, Dentistry, Occupational Hazards, Post Exposure Prophylaxis, Blood-borne Pathogens

INTRODUCTION

Dental healthcare workers (DHCWs) are at the greatest risk of exposure to blood-borne pathogens such as hepatitis B, hepatitis C and HIV mostly from percutaneous injury (PI) everyday. PI wounds are caused during invasive procedures by accidental cut(s) which break the integrity of the skin, in which NSI is the most common route for blood-borne pathogens. NSI has been reported among healthcare workers since 1980. NSI is the most serious health problem among DHCWs putting their lives and careers at risk. One German study stated that the maximum number of participants had experienced NSIs at least once in their profession. A number of published studies have reported the rate of NSI in different populations of DHCWs. DHCWs usually face NSIs during dental procedures while using sharp objects and needles. It frequently occurs during local anaesthesia infiltration, re-capping, and disposal of needles or syringe. Among these, re-capping of needles is the most common cause of NSIs. An injury can happen any time during invasive procedures and it can be due to lack of knowledge, lack of training, inexperience, improper handling, and fatigue due to work overload.

In 2002, the World Health Organization (WHO) estimated that up to 2 million healthcare workers experience percutaneous injury each year and are exposed to blood-borne viruses. It also declared that 37.6% of hepatitis B, 39% of hepatitis C, and 4.4% of Human Immunodeficiency Virus (HIV) among healthcare workers globally were acquired through these injuries.

In dental schools, the frequency rate of percutaneous injury ranges from 1.97 to 12.5 per 10,000 patient visits. According to an observational study by Younai et al, the risk of NSIs among third year students is higher as compared to fourth year students and it is Attributable to lack of experience or improper handling during dental invasive procedures.

In Pakistan, the rate of NSI is approximately 2.9% in private dental practitioners, 2.4% in undergraduate students, 16.3% in faculty, and 44.7% in house officers. The prevalence rate of transmission for hepatitis C is 3.3% and hepatitis B is 33.3%.

Although a lot of studies were done on the awareness of NSIs among practicing dentists, little has been done for dental students. The aim of this study was to determine the incidence of NSIs among the 3rd and the 4th year dental students and house officers, to evaluate the level of knowledge, attitude, and management of post-exposure incidents.

METHODOLOGY

This study was conducted at Bhitai Dental and Medical College, Mirpur Khas and included 3rd and 4th year dental students and house officers. It was a descriptive cross-sectional study. The number of NSIs and post-exposure management in the past 12 months was assessed by a questionnaire-based survey. SPSS 19 was used to analyze the data.

RESULT

A total of 330 respondent participated in this study. Out of these, 252 (76.3%) were dental students and 78 (23.6%) were dental house officers. Distribution of male and female students was 24% and 52% respectively and male and female house officers were 14% and 9% respectively as shown in Graph 1.

In this study, 207 (63%) of 330 had encountered an NSI (Graph 2). Of these, 131 (63.7%) had suffered NSI at least once in a lifetime. Forty-eight (21.7%) were injured twice and 31 (14.9%) were injured more than twice. We also found that only 45 (21.7%) had reported NSIs. Most of the participants (78.6%) did not report NSI to anyone while only 21.4% reported. Only 20.4% received post-exposure management.

When participants were asked about hepatitis B vaccination, 73% reported being vaccinated. Sharp bins were used by 27.3% participants and 87% wore gloves during all dental procedures (Table 1).

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Among dental students and house officers, NSI occurred most commonly during re-capping (31%) of the needles; local anaesthesia injections accounted for 21% of cases;
and 19% occurred during scaling of teeth. Other reasons reported included the use of instruments such as bur, scalpel, and sharp disposal as shown in Graph 3.

**DISCUSSION**

NSI is the most common route of transmission for blood-borne diseases among the dental healthcare workers. In our study, 63% students had experienced NSI during different dental procedures, mostly due to inexperience or lack of supervision. According to international studies, inexperience, lack of supervision, excessive workload, and fatigue are the main reasons for NSIs among the dental students. In our study, we found that re-capping of local anaesthesia (LA) injection and dental scaling were the two main causes of NSIs among dental students. Other studies also reveal that sharp needles such as infiltration, block needles, or syringes are the major source of PI among dental professionals. In the present study, 48% house officers reported NSIs, citing recapping of the needle as the most common reason. One study in Karachi, Pakistan shows that the risk of NSI is higher in house officers. Other studies have also shown increased rates of NSI in dental postgraduate trainees and dental students.

According to Aga Khan University Hospital, Karachi, every year, 12–27% NSIs are reported. One study in Iran has shown that 45% participants had encountered NSI, and the most common reason given was inexperience and lack of knowledge. In dental professionals, the risk of occupational exposures to blood-borne viruses like hepatitis B, hepatitis C and HIV through needle stick injury is a challenging issue. In Pakistan, reported frequency of hepatitis B and hepatitis C is 4 to 6%. Aslam M, et al have found that 34% health workers were exposed to hepatitis B or hepatitis C via NSI. Among the blood-borne diseases, hepatitis B is preventable. Worldwide, approximately 80% healthcare workers know about hepatitis B vaccination. In the present study, 70% of the dental students and house officers were found to have been vaccinated against hepatitis B. This affirms that dental professionals should be aware of the threat of NSI and be equipped with protocols regarding the risk of blood-borne infections in their clinical areas. However, 30% dental professional were found not taking NSI seriously. Multiple educational and awareness sessions should be planned to educate them regarding the importance of NSI.

The risk of NSI may be reduced by barriers such as gloves but these are not effective against sharp instruments. In our study, 87% reported wearing gloves during dental procedures as compared to Sumathi Muralidhar, who showed that 26% DHCWs were not using gloves. A study in Iran revealed that 96.2% were using gloves at the time of injury.
In this study, 78.6% did not report the exposure incident fearing stigmatization and discrimination. We also discovered that post-exposure management was completely inadequate in those students who had reported the exposure incident.  

Reviewing the studies and comparing with our results, we found it extremely important to design, introduce, apply, assure, and reassure compliance to the protocols regarding NSIs in our dental and clinical departments.  

CONCLUSION  

NSIs are a major route for transmission of blood-borne infections among dental students and house officers, who are aware of this fact. However, reporting of NSIs and post-exposure management was found to be completely insufficient. Preventive protocols should exist in all clinical departments. A dire need exists to invest resources in educating students at the time of their orientation prior to beginning their clinical rotations, stressing the importance of reporting an NSI. Hepatitis B vaccination should be made mandatory in order to minimize the risk of blood-borne diseases. Awareness and educational sessions for blood-borne diseases like HIV, hepatitis B and hepatitis C should be planned for all dental healthcare worker to protect them from these diseases.  

Authors’ contributions: Dr Irfan Ali and Dr Faisal Hameed conceived the idea, searched for literature search, collected, analysed and reviewed data, wrote the introduction, and discussion. Dr Ali Maqbool and Dr Muhammad Kazim searched for literature, worked on results and discussion. Dr Muhammad Aqeel Aslam and Dr Saaduddin Siddiqui reviewed the literature. Dr Muhammad Aqeel Aslam and Dr Saaduddin Siddiqui reviewed the literature, worked on discussion and edited the manuscript. Dr Nabeel Hafeez reviewed the literature, result, and conclusion. All authors contributed to the final manuscript.  

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