

DENTAL PROFESSIONALS EXPERIENCE REGARDING SHARP INJURIES DURING PRACTICE

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ABSTRACT

The purpose of this study was to investigate the experience of dental professionals regarding sharp injuries, working in the twin cities of Rawalpindi and Islamabad.

A cross-sectional study of 180 dentists was conducted. The participants answered a self-administered questionnaire. Associations between the sharps injury and practicing information were assessed using the chi square test and the logistic regression analysis (OR, CI 95%, $p \leq 0.05$).

Participants receiving sharp injury during work are 63.9% but 49.1% reported the incident. Needle stick injuries were 42.6% and palm were affected in 80.9% cases. Dentists belonging to 30-40 years of age were 3.4 times more likely to experience sharps injury. Dentists in teaching hospital and private clinics were less likely to experience sharps injury as compared to those working in hospital setting (OR= 0.10 and OR= 0.13 respectively).

Threat to injury is always there but following standard operational procedures and reporting is the key to overcome these incidents.

Key Words: *Prevention, Needle stick injuries, Dental professionals, Post exposure protocol.*

INTRODUCTION

The risk of acquiring blood-borne pathogens through sharps during dental procedures is undeniable. Sharp Injury is a penetrating wound from needle, bur, scalpel or any other instrument that may result in contact with blood or other body fluids.¹ Occupational exposures to percutaneous injuries are a substantial source of more than 20 blood borne diseases, but those of primary significance to dentists are HBV, HCV and AIDS.²

According to a WHO study, the annual estimated risk of Health Care Workers (HCW) exposed to blood-borne pathogens globally were HBV (30%), HCV (3%), and HIV (0.3%).²⁻³ Estimated prevalence of HBV in our population is 3-4% and HCV is 6%. Therefore the collective prevalence would be around 10%.⁴

On average US dental healthcare workers sustain 3 injuries a year and 32-33% of them are related to

needles.⁵ Exact incidence of injuries due to sharp instruments is not known. WHO reported that 90% of the occupational injuries reporting is from the developed world.⁶ Most of the developing countries do not have a formal blood and body fluid exposure reporting system, due to which exposures go unreported and inadequately treated. Lack of knowledge, underestimating the risk associated and time limitations also prevent these injuries from being reported.^{7,8}

The occurrence of sharp injuries is significantly higher among dentists, and less reporting of injury should not be considered as absence of problem. The aim of present study is to assess the dental professionals experience regarding sharp injuries during Practice at the dental setups in Rawalpindi and Islamabad.

METHODOLOGY

This cross sectional study of six months duration was conducted among dentists practicing in Rawalpindi and Islamabad. A self-administered questionnaire consisting of questions about experience of sharp injuries and knowledge of post exposure protocol was distributed among general dentists and dental specialists. The inclusion criteria were dentists practicing in Rawalpindi and Islamabad. Keeping power of study at 0.90 and level of significance at 0.05, the sample size requirement turn out to be minimum of 180.

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A total 250 questionnaires were distributed among participants. After exclusion of improperly filled questionnaires 180 were included for analysis. Written consent was obtained from the participants. The questionnaire consumed a simple tick-box format and consisted of two parts. First part is about demographic and work details of participants such as age, gender, specialization status, duration of practice, working setup (private clinic, hospital setting, teaching hospital and private hospital), working hours and working system (two hands or four hands with assistance), The second part consisted of questions regarding sharps injury experience, location where injury occurred (divided into pre-clinical/clinical in which non-clinical areas in our study comprise prosthetic and orthodontic laboratories, phantom head laboratories in operative dentistry and sterilization area, and clinical refers to performing clinical work in dental operator), source of injury, affected body part, time of injury, knowledge of post exposure management protocol and vaccination status against HBV.

For data analysis, Statistical Package for Social Sciences (SPSS, v. 21) was used. Main outcome of the study was set as 'sharps injury'. Chi square test and logistic regression analysis were carried out to report Odds ratio and Confidence Interval at 95%.

RESULTS

In total, out of 250 questionnaires, 180 were returned completely filled giving a response rate of 72%. The demographic details of the participants are given in Table 1. Details of sharp injuries and vaccination status can be seen in table 2. Logistic regression analyses of demographic & practice details are available in Table 3.

No association was found between location where injury occurred (clinical or preclinical) and the length of working hours. Those dentists who did not have any knowledge about the post exposure protocol were less likely to experience sharps injury (OR= 0.43, 95% CI 0.185-0.994, p= 0.048). No significant association was found between sharps injury experienced and to whom it was reported.

DISCUSSION

Injuries from sharps are a grave concern for dentists as they can result in many serious consequences. NSI (42.6%) was found to be most common cause of sharp injuries in our study. This result was in accordance with other studies that also showed that the most injuries among dental professionals occur during the use of dental syringes.^{9,10,11,12} Local anesthesia is used multiple times during the course of dental procedure. Repeated capping, uncapping and disposal of the needle can place the dentists at higher risk of sustaining sharp

TABLE 1: DEMOGRAPHIC AND PRACTICE CHARACTERISTIC DETAILS OF DENTISTS IN RAWALPINDI & ISLAMABAD (N=180)

Characteristics	Number (%)
Gender	
Male	62 (34.4)
Female	118 (65.6)
Age (years)	
< 30	129 (71.7)
30-40	43 (23.9)
41-50	07 (3.9)
> 50	01 (0.6)
Specialization status	
General Dentist	137 (76.1)
Dental Specialist	43 (23.9)
Length of Practice as dentist (years)	
< 5	122 (67.8)
5-10	41 (22.8)
11-15	11 (6.1)
> 15	06 (3.3)
Working Setup	
Private clinic	28 (15.6)
Hospital setting	28 (15.6)
Teaching hospital	99 (55)
Private hospital	25 (13.9)
Working hours per day	
Up to 8	134 (74.4)
> 8	41 (22.8)
Working system	
Two hands	85 (47.2)
Four hands (with assistance)	91 (50.6)

injuries. Careful handling of the needle, using sharp containers and one-handed scoop technique for capping of the needle and adherence to the Occupational Safety and Health Administration standards can reduce the risk of needle stick injuries. Many studies also reported dental bur as most common cause of sharp injury which resulted either from careless approach during use of dental bur or not removing bur from hand piece after its use.^{13,14}

Most commonly affected body part as found in our study was hand (80.9%). This finding was in agreement with other studies that showed hands are more prone to sharp injuries.^{10,15} Some studies had categorized different parts of hands as palm, fingers and thumbs separately and reported fingers as most common site

TABLE 2: DETAILS OF SHARPS INJURY AND VACCINATION STATUS AMONG DENTISTS IN RAWALPINDI AND ISLAMABAD (N=180)

Characteristics	Number (%)
Sharp Injury	
Yes	115(63.9)
No	65 (36.1)
Source of Injury	
Needlestick	49 (42.6)
Bur	19 (16.5)
Blade	03 (2.6)
Explorer	07 (6.1)
Scaler	02 (1.7)
Endodontic files	01 (0.9)
Lab knife	10 (8.7)
Others	24 (20.9)
Location where Injury occurred	
Preclinical	21 (18.3)
Clinical	94 (81.7)
Body part injured	
Palm	93 (80.9)
Forearm	18 (15.7)
Foot	02 (1.7)
Eye	0 (0.0)
Cheek	02 (1.7)
Time of Injury	
Morning	76 (66.1)
Afternoon	39 (33.9)
Knowledge of post exposure protocol	
Yes	153 (85)
No	26 (14.4)
Did you report the incidence	
Yes	59 (50.9)
No	58 (49.1)
Vaccination against Hepatitis B	
Yes	96 (83.9)
No	19 (16.5)

of injury.^{13,16} One possible and simple explanation is that hands and particularly fingers are directly exposed and in contact with different sharps while performing a procedure as compare to other body parts like foot, forearm and cheeks.

Working in the clinical areas resulted in more injuries (81.7%) as compare to nonclinical areas (18.3%) in our study. This result was in agreement to a study (3

years period) conducted in Japan, out of 56, 31 events occurred during surgical procedures (clinical areas) and 25 occurred during cleaning procedures (non clinical area).¹¹ As far as sharp injuries in clinical areas were concerned, a survey conducted among 166 qualified dentists in Karachi and Hyderabad showed that 46% qualified dentists suffered NSI for two or more times during a year.¹⁸

Most injuries in the present study occurred during morning session (66%). Lee and colleagues in their study reported that peak hours in which injuries occurred were between 11:00 am to 2:00 pm and after 4:00 pm, timings close to lunch break and off duty hours.¹¹ On the other hand Callan and colleagues reported that over three quarter injuries in their study occurred in clinical area after 1:30 pm.¹⁷ Tang also reported that risk factors for sharp injuries among health care workers are night shifts and working continuously for more than 8 hours.¹⁶ However, in this study three quarter participants had working timings up to 8 hours, this can be a reason for more sharp injuries occurrence and reporting in the morning hours.

More than three quarter (85%) dentists in the present study were aware about the post exposure protocol. Despite this knowledge it was alarming that only 51% of the participants reported the incidence after sharp injury. Another study reported that only 51.5% dentists showed compliance with post exposure protocol.¹⁸ Knowledge about post exposure protocol is of utmost importance to prevent transmission of blood borne infections. Higher number of participants having knowledge about post exposure protocol but not implementing this in their practice should be probed further so that the factors which result in non compliance can be highlighted and worked upon.

In the present study, sharp injuries were more common in dentists belonging to age group 30-40 years, practicing for 5-10 years in both hospital and clinical settings and have done specialization. Interesting yet alarming findings were that individuals practicing four handed dentistry and those having knowledge about post exposure protocol were more likely to experience injuries as compared to those working alone and having no knowledge about post exposure protocol. This can be explained either by lack of training in infection control measures, poor perception about sharp injuries or a careless attitude towards universal precautions. Four handed dentistry can also result in more sharp injuries if instruments are transferred carelessly from operator to dentist side and vice versa. Many times it is seen in clinical practices that clinical supervisors and specialists don't adhere to universal precautions (gloves, eyewear, mask and gowns) as strictly and rigorously as junior dentists do. Secondly, increase workload also

TABLE 3: LOGISTIC REGRESSION ANALYSIS OF DEMOGRAPHIC AND PRACTICE DETAILS OF DENTISTS WITH SHARPS INJURY

Characteristics	Sharps Injury N (%)	OR (CI)	Significance level
Gender			
Male	41 (35.5)	Reference	
Female	74 (64.3)	0.9 (0.45-1.6)	0.65
Age (years)			
<30	73 (63.5)	Reference	
30-40	35 (30.4)	3.4 (1.4-7.8)	0.005*
41-50	06 (5.2)	4.6 (0.54-39.3)	0.163
>50	01 (0.9)	124	1.00
Specialization status			
General Dentist	79 (68.7)	Reference	
Specialist	36 (31.3)	3.8 (1.57-9.08)	0.003*
Length of Practice as dentist (years)			
< 5	68 (59.1)	Reference	
5-10	31 (27)	2.5 (1.1-5.5)	0.027*
11-15	11 (9.6)	128	0.99
> 15	05 (4.3)	3.97 (0.45-35)	0.214
Working setup			
Private Hospital	17 (14.8)	Reference	
Hospital setting	21 (18.30)	0.26 (0.05-1.4)	0.117
Teaching hospital	54 (47)	0.10 (0.023- 0.467)	0.003*
Private Clinic	23 (20)	0.13 (0.026-0.69)	0.016*
Location where injury occurred			
Clinical	21 (18.3)	Reference	
Preclinical	94 (81.7)	0.11 (0.01-1.3)	0.079
Working hours/day			
Up to 8 hours	81 (70.4)	Reference	
> 8 hours	31 (27)	2.0 (0.92-4.5)	0.08
Working System			
Two handed dentistry	47 (40.9)	Reference	
Four handed dentistry	64 (55.7)	1.9 (1.03-3.6)	0.04*
Vaccination against Hepatitis B			
Yes	96 (83.9)	Reference	
No	19 (16.5)	0.87 (0.39-1.94)	0.741
Knowledge of post exposure protocol			
Yes	102 (88.7)	Reference	
No	12 (10.4)	0.43 (0.185-0.994)	0.048*
Did you report the injury			
Yes	58 (50.9)	Reference	
No	56 (49.1)	0.43 (0.43-5.47)	0.557
Who was injury reported to?			
Faculty member(s)	50 (90.0)	0.0	
Others	05 (9.1)	Reference	

*significant association

results in decrease compliance with universal precautions to prevent sharp injuries.

CONCLUSION

The alarming facts are the non-reporting of the incidence after sharp injuries and prevalence of injuries among experienced dentists practicing for 5-10 years. We recommend adherence to occupational hazards control measures by all dental professionals including young dentists as well as more clinically experienced. Authorities should ensure the application of occupational hazards control policies and commitment of the dentist to take the necessary steps after sharp injuries.

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CONTRIBUTIONS BY AUTHORS

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| 1 Lubna Pasha: | Gave the idea and performed the research study |
| 2 Huma Farid: | Conducted literature search and wrote the manuscript |
| 3 Mehreen Riaz Faisal: | Performed the statistical analysis |