

# Knowledge, awareness and compliance among dental professionals regarding percutaneous exposure incidents as occupational hazard

Shwethashri R. Permi<sup>1</sup>, Rahul Bhandary<sup>2</sup> & Biju Thomas<sup>3</sup>

<sup>1</sup>Post Graduate, <sup>2</sup>Professor, <sup>3</sup>Professor & HOD, Department of Periodontics, A.B. Shetty Memorial Institute of Dental Sciences, Nitte University, Mangalore, Karnataka, India.

Correspondence

Shwethashri R. Permi

Post Graduate, Department of Periodontics, A.B. Shetty Memorial Institute of Dental Sciences, Nitte University, Mangalore - 575018, Karnataka, India.

E-mail : harish.shwethashri@gmail.com

## Abstract

Percutaneous injuries constitute one of the most common occupational health hazards in healthcare profession. Dental professionals are at more risk of acquiring these injuries due to their limited and restricted working area in mouth. This was a cross-sectional study done among dental professionals in Mangalore, Dakshina Kannada, Karnataka state India to assess Knowledge awareness and compliance among dental professionals regarding percutaneous exposure incidents. This study concludes that Dental professionals are at a high risk of occupational disease due to accidental exposure to infected blood and body fluids. For which appropriate measures not taken after one such exposure There is a need of clearing the present misconceptions through educational training programs early in the study period and providing facilities for reporting, documenting, supportive and proper guidelines regarding percutaneous injuries in work place for healthy community.

Keywords : Percutaneous exposure, Body fluids contamination, post exposure prophylaxis

## Introduction

Percutaneous exposure incident (PEI) is a very broad term that includes needle stick and sharps injuries, as well as cutaneous and mucous exposures to blood and serum. From an occupational point, PEI represents the most common route for transmission of blood-borne infections from patients to dentist and supporting dental staff.<sup>(1)</sup>

During dental procedures it is known that saliva becomes contaminated with blood. Even if blood is not visible, it is still likely that very small quantities of blood are present, but high risk for transmission of HBV, HCV, or HIV is highly uncommon. Even though there is small transmission risk,

dentist should be cautious to any occupational exposure to saliva in dental settings, regardless of clear visible blood. However, the transmission risk is influenced by the type and number of

microorganisms present in the blood, presence of infected visible blood on the needle, depth of the injury site and size and type of needle used, scalpel used for incident.<sup>(2)</sup>

Efforts to prevent percutaneous injuries and other occupational exposures to blood and other body fluids have resulted in a growing number of initiatives to ensure safe working conditions in health care settings. CDC's Health care Safety Challenge and Healthy People 2010 objectives call for the elimination or prevention of needle stick injuries among Health Care Professionals.<sup>(3)</sup>

All patients should be considered to pose a potentially high risk of infection also, all standard recommended precautionary measures should be followed at all times. An effective and multifaceted management protocol must be prepared for prevention and management of percutaneous injuries in healthcare setup. After an occupational exposure, the healthcare provider should be aware about the degree of risk associated with exposure, percutaneous injuries pose a greater risk than splashes,

Access this article online

Quick Response Code



and those from hollow-bore needles.<sup>(4)</sup> Hence this study was designed to assess the compliance and knowledge among dental professionals regarding percutaneous injuries which can pose as occupational threat.

### Objective

To assess knowledge, awareness and compliance among dental professionals regarding percutaneous exposure incidents as occupational hazard

### Materials and methods

A cross-sectional questionnaire study was conducted among 500 dental professionals. Who voluntarily participated in the study. The subjects were fully informed, written consent was obtained and anonymity of the participants was maintained throughout the study. Institutional ethical clearance was obtained. Data collected was based on structured questionnaire distributed among the dental professionals, the questionnaire included a full range of response options designed to identify the professional's knowledge and compliance regarding universal precautions in the health care sector.

### Results

A total of 500 respondents completed the questionnaire, of these students 66.67% were female and 33.33% were male. Mean age of total respondents was 20.66 years (males, 21.14 years; females, 20.18 years), of 500 respondents 93.4% were aware of percutaneous injuries and 48.4% respondents have experienced, 73.6% have experienced at least once during their study period or during practice 77.6% have not reported about injuries to institutional board nor regional centres, as depicted in Table I

Table II depicts various instruments through which respondents experienced injuries of which 43.6% were due to injection needle, 52.2% during recapping of needle and followed by burs 19.6% these injuries can be prevented by certain precautionary measures followed during procedure. Respondents attitude regarding disposal of these needle were poor as 19.8% disposed in dustbin.

Table III depicts knowledge regarding management after

percutaneous injuries of them 31% believed in promoting active bleeding at site of injury and 27.2% respondents believed in wiping with anti-infective agents this knowledge of management is poor among professionals in managing of one such injuries experienced by them which has to be emphasised. 82.6% respondents were aware of blood born transmission of disease which included HIV, Hepatitis B, Hepatitis C.

Table IV depicts knowledge regarding immunization of Hepatitis B 92.2% respondents are immunised and 0.6% were not aware of it, 64% of them have not checked their anti Hbs titre and 21.8% of the respondents are not aware of anti Hbs, but 79.2% of them consider its essential to evaluate anti Hbs antibody titre regularly and immunize themselves accordingly.

Table V depicts knowledge and awareness of post exposure prophylaxis employed in case of accidental percutaneous injuries 66% of respondents were aware of group of drugs administered in PEP protocol. 35.4% believed it should be initiated within half an hour after exposure.

Table VI depicts compliance regarding percutaneous injuries 29.8% practised universal precautions depending upon medical risk before treating any patients. 96.4% respondent showed positive attitude regarding immunization protocols should be stressed on dental professionals during study period or continuing education programmes for healthy dental fraternity.

### Discussion

Occupational disease burden is increasing at an unprecedented rate. Proportionate training of human resources in occupational health and safety has not taken place at same pace. The dental fraternity has systematically ignored the importance of occupational health and safety and disaster management in teaching, training and epidemiological research. In 1985, in order to increase awareness among health care workers of the dangers of sharp injuries and other types of disease transmission, the Centres for Disease Control (CDC) and the Occupational Safety and Health Administration (OSHA) in the United

Table I : statistical results regarding awareness of percutaneous injuries

|  |             | Frequency(n) | Percentage (%) |
|--|-------------|--------------|----------------|
| Do you know what is percutaneous injuries are  | Yes         | 467          | 93.4           |
|  | No          | 33           | 6.6            |
| Have you ever experienced percutaneous injuries during study period or during practice                             | Yes         | 242          | 48.4           |
|  | No          | 258          | 51.6           |
| Number of injuries experienced in one year period  | 0-1         | 368          | 73.6           |
|  | 2-5         | 129          | 25.8           |
|  | 6 and above | 3            | .6             |
| Have you reported to concerned authorities regarding percutaneous injuries in your institution or regional centres | Yes         | 112          | 22.4           |
|  | No          | 388          | 77.6           |

Table II : Statistical results regarding injuries experienced

|   |  | Frequency(n) | Percentage (%) |
|---|--|--------------|----------------|
| Percutaneous exposures using what type of devices     | Scalers                                  | 63           | 12.6           |
|   | Injection needles                        | 218          | 43.6           |
|   | Burs                                     | 98           | 19.6           |
|   | Scalpel blade                            | 26           | 5.2            |
|   | Elevators                                | 18           | 3.6            |
|   | Soiled gloves                            | 3            | .6             |
|   | Curettes                                 | 74           | 14.8           |
| Timing of injury when using disposable injections     | During injecting                         | 188          | 37.6           |
|   | During recapping                         | 261          | 52.2           |
|   | During disposal                          | 51           | 10.2           |
| Correct route of disposal of needles and other sharps | Dispose in puncture resistant containers | 172          | 34.4           |
|   | Bend the sharps and put in dustbin       | 99           | 19.8           |
|   | Destroy in sharp destroyer containers    | 229          | 45.8           |

Table III : knowledge based evaluation regarding percutaneous injuries

|   |  | Frequency(n) | Percentage (%) |
|---|--|--------------|----------------|
| Precautions to be taken after accidental exposure                         | Promote active bleeding at site of injury                            | 155          | 31.0           |
|   | Wash in running water and detergent                                  | 102          | 20.4           |
|   | Wipe with sprit or any other anti infective agents                   | 136          | 27.2           |
|   | Taking post exposure prophylaxis immediately after initial scrubbing | 107          | 21.4           |
| Occupational blood borne diseases transmitted through accidental exposure | Hiv  | 29           | 5.8            |
|   | Hepatitis b  | 55           | 11.0           |
|   | Hepatitis c  | 3            | .6             |
|   | All the above  | 413          | 82.6           |

Table IV : knowledge regarding immunization

|  |                               | Frequency(n) | Percentage (%) |
|--|-------------------------------|--------------|----------------|
| Are you immunized for hepatitis b vaccination                            | Yes                           | 461          | 92.2           |
|  | No                            | 36           | 7.2            |
|  | Not aware of the immunization | 3            | .6             |
| Your anti hbs antibody titer is in what range                            | Protected range               | 43           | 8.6            |
|  | Unprotected range             | 28           | 5.6            |
|  | Not checked                   | 320          | 64.0           |
|  | Not aware                     | 109          | 21.8           |
| Do you think its essential to evaluate anti hbs antibody titer regularly | Yes                           | 396          | 79.2           |
|  | No                            | 104          | 20.8           |

Table V : Awareness regarding post exposures measures

|  |                     | Frequency(n) | Percentage (%) |
|--|---------------------|--------------|----------------|
| Are you aware of post exposure prophylaxis pep                 | Yes                 | 312          | 62.4           |
|  | No                  | 188          | 37.6           |
| Pep protocol employs which group of drugs                      | Anti microbial      | 96           | 19.2           |
|  | Anti retro viral    | 330          | 66.0           |
|  | Anti fungal         | 20           | 4.0            |
|  | Immunosuppressant's | 54           | 10.8           |
| Chemoprophylaxis following percutaneous injury should commence | Within half an hour | 177          | 35.4           |
|  | Within one hour     | 162          | 32.4           |
|  | Within 24 hours     | 161          | 32.2           |

Table VI : Compliance regarding percutaneous injuries

|   |                                    | Frequency(n) | Percentage (%) |
|---|------------------------------------|--------------|----------------|
| Do you practice all universal precautions before treating any patients                              | Yes                                | 328          | 65.6           |
|   | No                                 | 23           | 4.6            |
|   | Depends on medical risk of patient | 149          | 29.8           |
| Do you think compliance regarding immunization protocols should be stressed on dental professionals | Yes                                | 482          | 96.4           |
|   | No                                 | 18           | 3.6            |

States introduced the "Universal Precaution Guidelines," which have become the worldwide standards in both hospital and community care settings.

The field of dentistry has responded to the challenge of the frequent needle stick injuries and other sharps with more revolutionary engineering technologic solutions, thus eliminating injuries taking place either during re sheathing or during disposal of the used needle with the introduction of safety dental syringes and appropriate use of sharp instruments with safety measures. In our study 52.2% experienced injuries during recapping needles this incidence is slightly higher than that found in a study by Norsayani et al. <sup>(5)</sup> The influence of under reporting percutaneous injuries has been demonstrated in study done by chaco et al <sup>(6)</sup> showed that 23.7% respondents never reported the incident of injury but in our study its 77.6% which is high.

Attitude regarding needle disposal in our study 19.8% threw in dustbin, others have reported in their study that 12.5% of respondents threw needles directly into dustbin, <sup>(7)</sup> correct disposal of needles and sharps should be emphasised in practice. regarding awareness of managing percutaneous injuries in our study 31% believed in promoting active bleeding at site of injury whereas, others

reported 26% respondents would promote active bleeding at site of injury. <sup>(7)</sup>

The CDC recommends testing for antibody after completion of three injections of HBV vaccine, and if negative, gives a second three-dose vaccine and test again for anti-HBsAg antibodies. If there is no antibody response, no further vaccination is recommended. If an employee has a blood exposure to a patient known or suspected to be at high risk of HBs Ag sero- positivity, he should be given HBIGx2 (one month apart) or HBIG and initiate revaccination. <sup>(8)</sup> Many respondents even though are vaccinated, the sero conversion status after vaccination is not assessed in them timely, as reported by Barone et al. <sup>(9)</sup>

Our study revealed that knowledge, awareness and compliance about the risks associated with percutaneous injuries and use of preventive measures was inadequate. Guidelines should be formulated and it should outline precautions to be taken when dealing with blood and body fluids. It also contains reporting procedures and management of all percutaneous injuries. Lectures, CDE programme on hazards, prevention and post-exposure prophylaxis to dental fraternity should be conducted regularly, there is a need for more emphasis on creating awareness on these issues. An effective occupational

health and safety program should be emphasised that includes immunization, PEP and dental surveillance.

#### Conclusion

All dental professionals should undergo a comprehensive Training program regarding awareness of percutaneous

injuries, that describes procedures for identifying, screening and, when appropriate, adopting safety devices, mechanisms for reporting and providing medical help for individuals and a system for training them to practice in safe work place and the proper use of safety devices for self, patient protection and for well being of community.

#### References

1. Hanrahan A, Reutter L. A critical review of the literature on sharps injuries: epidemiology, management of exposures and prevention. *J Adv Nurs* 1997;25:144-154.
2. Cleveland JL et al. Use of HIV postexposure prophylaxis by dental health care Personnel: an overview and updated recommendations. *Journal of the American Dental Association* 2002;133:1619–26.
3. U.S. Department of Health and Human Services. Healthy people 2010 objectives: Objective 20-10—Reduce occupational needlestick injuries among health care workers.
4. Lum D, Mason Z, Meyer-Rochow G, Neveldsen GB, Siriwardena M, Turner P, et al. Needle stick injuries in country general practice. *N Z Med J* 1997;110:122-5.
5. Norsayani MY, Noor Hassim I. Study on incidence of needle stick injury and factors associated with this problem among medical students. *J Occup Health*. 2003 May;45(3):1728.
6. Chacko J, Isaac R. Percutaneous injuries among medical interns and their knowledge & practice of post-exposure prophylaxis for HIV. *Indian J Public Health*. 2007 Apr-Jun;51(2):127-9.
7. Guruprasad Y, Chauhan DS. Knowledge attitude and practice regarding risk of HIV infection through accidental needlestick injuries among dental students of Raichur, India. *Natl J Maxillofac Surg* 2011;2:152-5.
8. Centers for Disease Control. Perspective in disease prevention and health promotion update, Universal precautions for prevention of transmission of HIV, HBV and other blood-borne pathogens in health care settings. *MMWR* 1988; 37: 24.
9. Barone P, Sciacca A, Lupo F, Leonardi S, Hepatitis B vaccination in young nurses of a general hospital, *Ann Ig* 1995; 7 : 251-5.