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PREVALENCE OF PERCUTANEOUS EXPOSURE INJURIES AS PROFESSIONAL THREAT IN GENERAL DENTAL PRACTICE, PREVENTION AND CONTROL AGAINST PEI RELATED INFECTIOUS DISEASES IN AL-AHSA, SAUDI ARABIA

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ABSTRACT

In spite the numerous technical advances in recent years, many occupational health problems persist in modern dentistry. These include percutaneous exposure injuries (PEI); exposure to infectious diseases (including bio aerosols), radiation, dental materials, and noise; musculoskeletal disorders; dermatitis and respiratory disorders; eye injuries; & psychological problems. Percutaneous Exposure Injuries remains a particular concern, as there is an almost constant risk of exposure to dangerous infectious agents. Strategies to minimize Percutaneous Exposure Injuries and their consequences should continue to be employed, including sound infection control practices, continuing education, and hepatitis B immunization. As of any infection control protocols, dentists must continue to utilize personal protective measures and appropriate sterilization or the high-level disinfection techniques. Aside from biological hazards, dentists continue to suffer a high prevalence of musculoskeletal disorders, especially of the back, neck, and shoulders. The cause for the success in decreasing needle stick and sharps injuries may attribute to the end of needle re-capping & the use of safer needle devices, sharps objects collection boxes, gloves and personal protective gear, and universal precautions.

KEYWORDS: Percutaneous exposure injuries, hepatitis B, needle stick.

INTRODUCTION

Healthcare workers (HCW) are on a daily basis at risk of exposure to blood-borne pathogens through percutaneous exposure incidents (PEI). "Percutaneous exposure incident" is a broad descriptive term that includes needle stick and injury with a sharp object, as well as cutaneous

and mucosal exposures to blood, saliva, tissue and other bodily fluids that are potentially infectious. Nurses, physicians, surgeons, laboratory workers, dental and medical personnel, and students in clinical training are considered high risk categories.[1]

Oral health care workers are particularly vulnerable as the dental environment is unique when compared with other health care settings due to the oral cavity being a small operating field, the close contact that is required between dental personnel and the patient during procedures, the possibility of sudden movements of the patient, the use of sharp dental instruments and the likelihood of direct or indirect contact with traumatized tissues, saliva and blood, all on a daily basis. Furthermore, collisions with sharp objects can occur due to the close positioning of the instrument delivery system which houses the hand pieces, most probably fitted with pointed burs, and handily placed to effect injury when the operators themselves move without care.[3]

Most injuries occur during oral surgery procedures (35%), 19% during restorative work, 13% in hygiene procedures and 9% are associated with periodontal surgery. Research indicates that the majority occur as a result of an accident with the dental syringe during the administration of a local anesthetic.

The reported prevalence of percutaneous injuries among dental students ranges from 20%-80%. Students are at a higher risk due to their inexperience in handling clinical instruments and infection control procedures and by the pressure occasioned by the need to complete a set number of clinical case requirements to the satisfaction of the supervisor.[2]

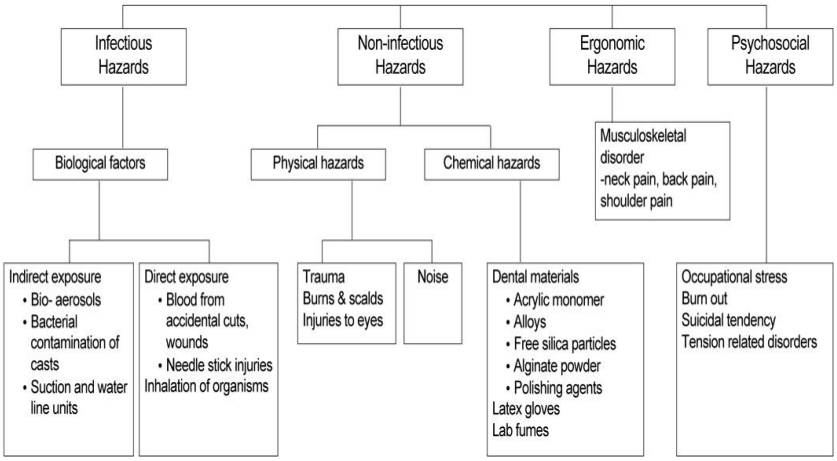

Table 1: The different types of Occupational Hazards fount in the Dental office.

AIM AND OBJECTIVE

The aim of the present study was to determine the prevalence, knowledge, management and perceptions of percutaneous injuries among dental staff and students in Al-Ahsa, Saudi Arabia by Determining the knowledge of current dental staff and students on the clinical management of such injuries and their perceptions through a cross-sectional study and by comparing current Departmental policies and clinical protocols with the recommended universal/ standard precautions on the management of percutaneous exposure injuries.

METHODOLOGY

A cross-sectional study used a self-administered questionnaire to determine the knowledge, management and perceptions of percutaneous exposure incidents among current dental staff and students in Al-Ahsa, Saudi Arabia. Information was collected regarding the understanding of percutaneous injuries, infection control practices, the reporting of the incident and the use of post-exposure prophylaxis. The sample was drawn from the dental clinical staff at Oral Dental Training Centers (dentists, dental therapists, oral hygienists and dental assistants) and dental therapy and oral hygiene students from Al-Ahsa, Saudi Arabia. Each individual, staff or student, was personally approached and invited to participate, having been informed that participation was voluntary. A stratified random sampling method based on the extent of clinical experience was used to divide the student study population (n=90) into sub-groups and a random sample was taken from each sub-group. Hence, the student sample included mainly second and third year students (n= 47) with a small selection (n=13) of first year students whose clinical exposure was observation of dental procedures. The final sample comprised 70 members of staff and 30 students for a total of 100 and was viewed as

representing the combined experience of those involved in the discipline. The response rate for staff was 93% and for students, 88%.

In addition, the current Hospital policy regarding percutaneous exposures was evaluated in comparison with a list of gold standard criteria as recommended by the Centre for Disease Control (CDC) for the management of percutaneous injuries. The data was captured in MS Excel, basic descriptive analyses completed and the files were imported into SPSS version 20.0 for further assessment.

RESULTS

The current sample

The cross-sectional study was conducted on a mixed sample which included both dental staff and students and in which the greater proportion were females.

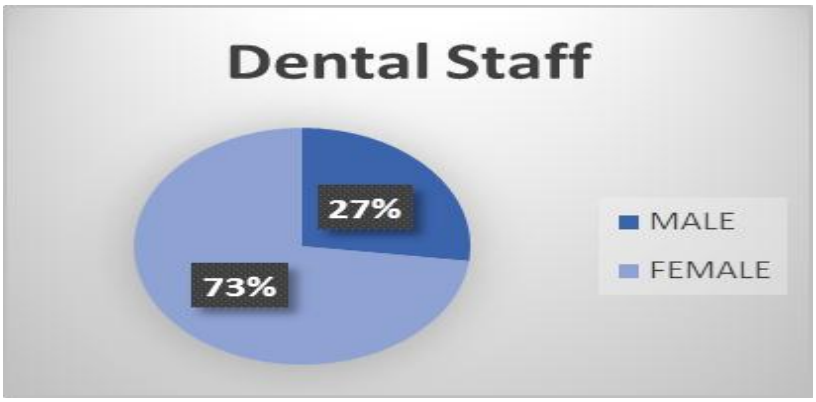

Chart 1: The proportion of the cross sectional study sample (Dental Staff).

Most of the respondents (83%) recorded that they adhered to the practice of standard precautions when treating patients. Almost three quarters (74%) of those having had a PEI had previously completed three doses of the Hepatitis B vaccine, but only 41% had checked whether they had any immunity after taking the vaccine. More encouragingly, 44% reported having had a booster vaccine.

Table 3: The Category of the Oral Care workers who had percutaneous injuries.

CATEGORY	MALE	FEMALE	TOTAL
General Dentists	17	43	60
Dental Specialists	5	6	11
Oral Hygienists	0	6	6
Dental Assistants	0	13	13
Students	5	5	10
Total	27	73	100

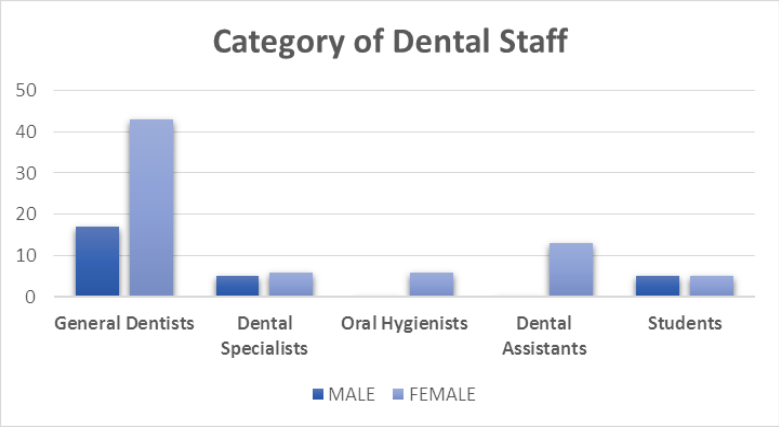

Chart 2: The Category of the Oral Health Care workers suffered with PEI.

Amongst the current staff and student cohort, 22% reported having sustained a percutaneous injury. Of these, 43% had experienced at least one, more than half (57%) had suffered more than one injury and almost a quarter (24%) had experienced three or more PEIs More than a half of the injuries (57.9%) were due to mishaps with the dental syringe and needles. Injuries associated with the use of the dental elevator and Blade were also common (10.5% each).

Table 3: Cause of Percutaneous Injury in Dental Staff.

CAUSE OF INJURY	NUMBER	PERCENTAGE
Needle Stick	22	57.9%
Surgical Elevator	4	10.5%
Eye Splash	6	15.8%
Matrix Band	0	0%
Bur	10	26.3%
Blade	4	10.5%
Explorer	10	26.3%
Scaler	2	5.3%
Endodontic Files	17	36.8%
Lab Knifes	2	5.3%
Patient Bit My Finger	4	10.5%
Others	2	5.3%

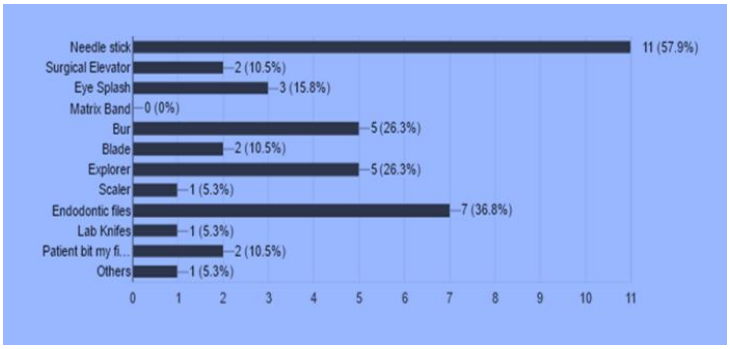

Chart 3: Cause of the percutaneous injury among the Dental Staff.

Most percutaneous injuries (63%) were caused during a minor oral surgery procedure. Nearly two-thirds (80%) of the injuries occurred to the finger, especially when a minor oral surgery procedure was being performed (20%).

Table 4: Part of the body Injured during Percutaneous Injury.

PART OF THE BODY INJURED	NUMBER	PERCENTAGE
Palm	4	10%
Forearm	4	10%
Foot	0	0%
Eye	4	10%
Cheek	0	0%
Thumb	12	30%
Finger	32	80%
Thigh	0	0%

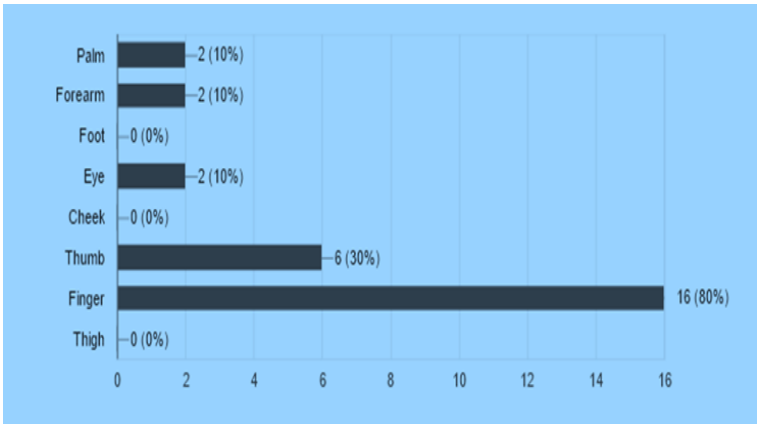

Chart 4: Graph showing the Percentage of the part of the body injured among Dental Staff.

Two out of every three incidents (66.7%) occurred during, and a quarter (25%) occurred after, the dental procedure, during the cleaning up process. Oral health care workers reported considerable emotional distress, displaying reactions of anxiety, fear, sadness and anger and some were totally devastated. Anxiety was the most common emotion reported by nearly quarter of the sample. Most respondents had reported the incident (81%) and those that had not had considered the injury too small to be of any significance, or that the source patient had been shown to be HIV negative whilst some thought there was no risk of infection or were unaware that they had to report the incident. Almost all the respondents who sustained and reported percutaneous injuries (94%) took the post exposure prophylaxis (PEP), however only 22.2% had taken the medication for the recommended period of four weeks.

More than half of the respondents (55.6%) had taken the PEP for between two to four weeks. Only 13.6% of those that incurred a percutaneous injury had the recommended full series follow-up blood tests and 18% did not have any follow-up blood tests at all.

Most of the respondents (86%) had received pre-test counselling, 68% received post-test counselling but only 23% had any follow-up counselling after an injury.

DISCUSSION

By analyzing and investigating the causes of injuries, useful information may be gleaned. Information regarding the circumstances surrounding the reported injury may be valuable in preventing further injuries by modifying work practices. The needle was the most common source of injury among dental students and staff (57.9%). This finding increased when compared with previous studies which reported the syringe needle to be associated with 30-36% of all percutaneous injuries at a dental training institute.

Most injuries occurred when the needle was being withdrawn from the patient's mouth, while recapping the needle and when removing the used needle from the syringe.

Most of the injuries occurred while the operator was performing minor oral surgical procedures, followed in frequency by scaling and polishing and restorative procedures. Cleveland also found that while most percutaneous injuries occurred in oral surgical procedures, whilst the findings for other procedures differed: 19% of injuries were related to restorative procedures and 13% to oral hygiene procedures. Injuries occurring during minor oral surgical procedures can be reduced by strictly adhering to the latest standard precautions of double gloving and the use of blunt-tip suture needles as an alternative to the sharp product currently used. Blunt-tip suture needles have been shown to reduce needle stick injuries by 69%.

The present study, in agreement with similar studies conducted in other parts of Saudi Arabia showed that the finger of the non-dominant hand that plays a supportive role was the most common site of percutaneous injuries, followed by the eye.

CONCLUSION

A percutaneous exposure incident is a serious occupational health hazard that places dental staff and students at risk of transmission of blood-borne pathogens. The current study shows that percutaneous injuries are an ongoing problem at the ODTC and highlights the fact that

dental personnel are at a higher risk of suffering percutaneous injuries than other health professionals working at the Ahsa Hospital, Al-Ahsa, Saudi Arabia.

High risk activities have been identified, enabling recommendations on modifications of work practice to reduce the incidence of percutaneous injuries at the ODTC. Accidents are sometimes unavoidable but attending to a percutaneous injury as soon as it occurs, treating it as a medical emergency and following through with the management protocol are of utmost importance to prevent the transmission of blood-borne diseases. It is of concern that the present study revealed that personnel do not comply with management protocols regarding completion of post-exposure prophylaxis and follow up tests.

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