INFECTION CONTROL IN DENTISTRY KNOWLEDGE AND PRACTICES REGARDING BARRIER TECHNIQUES, POST EXPOSURE MANAGEMENT AND PROPHYLAXIS — A STUDY

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ABSTRACT

This is a descriptive study conducted at Sardar Begam Dental College, Peshawar from December 2007 to March 2008. The purpose of the study was to assess the perception of cross infection in dental practice among dental surgeons and clinical dental students. Forty three (43) dentists and fifty seven (57) students were interviewed. Seventy nine percent of the participants asked their patients about the medical history, sixty five percent screened their patients for blood viral pathology (HBV, HCV and HIV) before any dental procedure was undertaken. Hundred percent wore and changed gloves during dental treatment between the patients, and ten percent wore goggles and ninety percent face masks routinely. Thirty five percent of the participants had positive history of needle prick injury during their dental carrier and 65 percent disposed off the needles and sharps in safe containers after their use and 84 percent resheath needle after local anesthetic injection.

Key words: *Cross infection control, Awareness level*

INTRODUCTION

Cross infection can be defined as transmission of infectious agents between patients and staff within a clinical environment. Transmission may result from person to person contact or via contaminated objects and requires a source of infection.[1] In dentistry, the source of infection may by the patients suffering from infectious diseases, those who are in the prodomal stage of certain infections, and healthy carriers of pathogens. [2]Viral diseases such as hepatitis especially B,D,C, Acquired immuno deficiency syndrome (AIDS) herpes simplex, cytomegalo virus are important risks not only for dentists but also for the community.[3'4] The dentist should routinely check the history of each patient for an event, condition, or medication that might significantly affect a projected oral treatment plan.[5] Transmission of infection through dental surgery may occur by direct contact of tissue with secretions or blood, from droplets containing infectious agent, or via contaminated sharps or instruments which have been improperly sterilized.[2'6] Any abrasion on the skin provides a potential route for blood born viral infections from patient to doctor or vice versa[7]. The risk is directly proportional to physical contact and immune status of the persons affected. High risk procedures carried out for prolong periods, increase the chances of transmission of blood borne viral infections. The risk is mostly related to needle prick injuries of conjunctival implantation of viruses through eye splashes.[8] The risk of blood borne viral infections in dental practice can be decreased by wearing good quality gloves, conjunctival spilage of blood can be avoided by using

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eye shields, goggles and surgical helmet.[7,9] Safe disposal of used dental disposables is necessery.[11] Disposal of used needles in a hard walled, leak proof and sealable container is also necessary.[10] Checking the serum hepatitis virus serology of all patients before using the instruments, as well as the serological testing of the operator must be done in order to prevent the spread to other persons.[12'13] Infection control has become such an integral part of the practice to the extent that dental health care workers no longer question its necessity.[14]

METHODOLOGY

This descriptive cross-sectional study was conducted at Sardar Begum Dental College, Peshawar from December 2007 to March 2008. Dental care professionals were interviewed by convenience sampling technique after taking their verbal consent The study population included dentists and clinical undergraduate students. Among the doctors there were consultants, demonstrators and house officers from the department of prosthodontics, orthodontics, periodontics, peadodontics, oral surgery and operative dentistry. Among students there were students of third year and final year BDS. A self administered, pre coded and pretested questionnaire to control the bias in the study was requested from the respondents to provide demographic data about age, gender knowledge and practice of infection control measures. Respondents were asked if they used each of the treatment, patient screening for blood virology, wore and changed gloves, during and between patients, wore goggles or protective eye shields and masks; changed mask after every patient or when it became moist or dirty; used a sharp waste disposal system and post occupational exposure strategies.

RESULTS

Results are given in tables 1,2,3 and 4. All these results were statistically analyzed. For all variables percentage are evaluated where as Chi-square test and fisher exact test was used where appropriately indicated to find out a p-value.

TABLE 1: VIEWS OF PARTICIPANTS

Questions					**P Value**
Habit of taking medical history from patient	**Yes**		**No**		
	Doctor	**Student**	**Doctor**	**Student**	0.02
	29	50	14	7	
	79(79%)		21(21%)		
	Yes		**No**		
Patient screening habit before a dental procedure	26	39	17	18	0.54
	65(65%)		35(45%)		

TABLE 2: VIEWS OF PARTICIPANTS REGARDING USE OF GLOVES

Questions	**Gloves**								**P value**
	Surgical		**Examination**		**Both**		**Double gloves**		
	Doctor	**Student**	**Doctor**	**Student**	**Doctor**	**Student**	**Doctor**	**Student**	
Which gloves do you use?	22%	23	43	57	22	23	3	5	0.72
	45(45%)		100(100%)		45(45%)		8(8%)		
Second time glove change during the same procedure; when become dirty for the same patient.	**Doctor**	**Student**			**Doctor**	**Student**			
	29	50			14	7			
	79(79%)				21(21%)				
Gloves wearing habit during examination of patient.	19	49			24	8			
	68(68%)				32(32%)				
After wearing gloves do you touch the objects like; unit, lamp, buttons, mobile etc	24	29			19	28			0.77
	53(53%)				47(47%)				

TABLE 3: VIEWS OF PARTICIPANTS REGARDING USE OF FACE MASK

Questions	Face Mask & Goggles				P Value
	Doctor	**Student**	**Doctor**	**Student**	0.02
	2	8	41	49	
Do you wear goggles and face mask	10(10%)		90(90%)		
	Doctor		**Student**		
Change of face mask for every patient	4		12		
	16<16 percent>				
Change on daily basis	41		33		
	74(74%)				
Change only when become dirty	2		8		
	10(10%)				
	Yes		**No**		
	Doctor	**Student**	**Doctor**	**Student**	0.18
Do you touch your face mask after wearing gloves	15	26	26	23	
	41(41%)		59(59%)		

TABLE 4: VIEWS OF PARTICIPANTS REGARDING NEEDLES

Questions	Needles						P value
	Doctor				**Student**		
Positive history of needle stick injury during your dental career	18				17		
	35(35%)						
	Allow to bleed the wound & wash only		Bleed>wash>covers with sterile bandage		Bleed>wash>bandage >disinfectant>bandage		
Precautions taken after getting injury	**Doctor**	**Student**	**Doctor**	**Student**	**Doctor**	**Student**	0.06
	2	3	32	53	9	1	
	5(5%)		85(85%		10(10%)		
Habit of safe disposal of needles & sharps in sage containers	Yes			No			
	26	39	17		18		0.54
	65(65%)				35(35%)		
Resheathing of needle habit after local anaesthesia injection	33	51	10		6		0.15
	84(84%)				16(16%)		
	One hand technique		Two hands technique				
Method of resheathing	26	23	7		28		0.004
	49(49%)				35(35%)		

DISCUSSION

Infection control forms an important part of practice for all health care professionals and remains one of the most cost beneficial medical interventions[15]. Dental health care workers are known to be at increased risk of hepatitis and HIV infections[16,17]. There is evidence to suggest that many infected patients are unaware of their status because of long incubation periods and post-infection window period during which antibodies cannot be detected[18,19]. Our study revealed the 79 percent of the participants asked their patients about medical history, while a study conducted by Mohammad A Al OMARI in Jordan reported 77 percent[15] and Abdullah Al Rabeah in his study conducted in Riyadh reported 93 percent[14] dentists took a routine medical history from patients before a dental procedure. This study showed that respondents were aware of the importance of medical history before a dental procedure, a medical history is important as it aids the diagnosis of oral manifestations of systemic disease,

moreover, medical conditions and medications which affect dental or surgical treatment are identified.[21]

This study also revealed that 65 percent respondents usually screened their patients routinely before a dental procedure, while our previous study reported 17.98 percent respondents having habit of screening their patients for blood viral pathology.[20] HBV infected blood and blood products are more dangerous and can transmit infections in as little as 0.0000001 ml fluid, particularly when containing the e antigen.[21] So it is desirable to check the serum hepatits virus serology of all patients before using the instruments.[20]

It revealed further that all the respondents have gloves changing habit for every patient. Only 10 percent respondents wore goggles and 90 percent face masks routinely and 74 percent changed face masks on daily basis and 10 percent when they became wet or dirty while a study conducted in Riyadh reported that 100 percent participants wore gloves and 90 percent face masks[14], a Jordanian study reported gloves wearing habit in 81.8 percent and face mask wearing habit in 54.4 percent [15], while a study conducted at KUWAIT showed that 90 percent of the respondents wore gloves and 75 percent wore masks and 52 percent wore eye glasses[17]. In New Zealand, Treasure et al showed in their study that 42 percent of dentists wore gloves, 64.8 percent masks and 66.4 percent did eye protection.[22] Comparing gloves wearing habit, our respondents were fully aware of the importance of gloves in dental practice, DHCP should wear gloves to prevent contamination of their hands when touching mucous membranes, blood, and saliva, and also with an aim to reduce the likelihood that microorganisms percent on the hands of DHCP will be transmitted to patients during surgical or other patient-care procedures.[22,25] Gloves should be changed between the patients and when torn or punctured.[25,26] Wearing gloves does not eliminate the need for hand washing.[27] Gloves are task specific, their selection should be based on the type of procedure to be performed (e.g, surgery or patient examination).[28,29,35] Appropriate gloves in the correct size should be readily accessible.[30] The frequency of perforations in surgeons gloves used during outpatient oral surgical procedures has been determined to range from 6 percent.[31,32] Studies have demonstrated that HCP and DHCP are frequently unaware of minute tears in gloves that may occur during use.[33,34] These studies determined that gloves developed defects in 30 minutes-3 hours, depending on type of glove and procedure . Investigators did not determine an optimal time for changing gloves during procedure.[26] This study shows that 79 percent of the respondents perform second time glove change during the same procedure; when become dirty with blood or saliva, which also shows high awareness of our respondent. 45 percent used sterile gloves (surgical) in addition to non sterile examination gloves. Certain limited studies have determined no difference in postoperative infection rates after routine extractions when surgeons wore either sterile or nonsterile gloves.[35.36] However, wearing sterile surgeons gloves during surgical procedures is supported by a strong theoretical rationale.[37] Sterile gloves minimize transmission of microorganisms from the hands of surgical DHCP to patients and prevent contamination of the hands of surgical DHCP with the patient blood and body fluids.[37] This study reveals that 8 percent of the participants wore double gloves for various dental procedures routinely: based on some studies on wearing double gloves it can be stated that double gloving might provide additional protection from occupational blood contact. Double gloving does not appear to substantially reduce either manual dexterity or tactile sensitivity[38,53] percent of our respondents report that they touch objects like lamp, buttons, drawer, and mobiles even while they have already worn gloves. During the dental practice the operators should remember that after wearing gloves. Whatever is touched is contaminated. Touch only what has to be touched, clean and disinfect the surfaces, use covers and barriers and discard them after every appointment. Moreover, a surgical mask that covers both the nose and mouth and protective eyewear with solid side shields or a face shield and protective clothing to prevent the contamination of street clothing should be worn by DHCP during procedures and patient-care activities likely to generate splashes or sprays of blood and body fluids.[26,27] Also protective eye wear for patients shields their eyes from spatter or debris generated during dental procedures.[39] Avoiding occupational exposures to blood is the primary way to prevent transmission of HBV, HCV, and HIV, to HCP in health care setting.[40] Injury by contaminated instruments presents a major risk to dental team. 35 percent of the respondents of this study reported percutaneous exposure during their dental carrier. Needles syringes and

sutures, burs, reamers, scaler tips, dental practice[41]. Percutaneous injuries among DHCP usually occurs outside patients mouth, there by posing less risk for re contact with patient tissues and always involve limited amounts of blood[42,44], but majority of exposures in dentistry are prevent-able, and methods to reduce the risk of blood contacts have included use of standard precautions, use of devices with features engineered to prevent sharp injuries, and modifications of work practices. These approaches might have contributed to the decrease in percutaneous injuries among dentists during recent years.[42]

Work practice controls for needles and other sharp items in appropriate puncture-resistant containers located as close as feasible to where the items were used[13]. This study shows that 65 percent of the respondents had the habit of safe disposal of needles and sharps in safe containers. Which showed that, our respondents were more aware of the importance of the safe disposal of sharps compared with the study conducted by Abdullah Al Rabeah (56.2 percent)[14] and GDPs from Jordan, as reported by Al Omari (31.8 percent)[15] and less aware, if compared with respondents of study conducted by Kurby and Fontaine (72 percent).[47] In addition, used needles should never be recapped or otherwise manipulated by using both hands or any other technique that involves directing the point of a needle towards any part of the body.[26] A one handed scoop technique should be employed for recapping needles between uses and before disposal.[22,23] DHCP should never bend or break needles before disposal because this practice unnecessary mani-pulation; passing a syringe with an unsheathed needle should be avoided because of the potential for injury.[26]

Post exposure management is an integral component of a complete program to prevent infection after an occupational exposure to blood. During dental procedures, saliva is predictably contaminated with blood.[24,43] Even when blood is not visible, it can still be present in limited quantities and therefore is considered a potentially infectious material.[26,30,43] After an occupational exposure, area should be washed with soap and water; mucous membranes should be flushed with water.[43] This study reveals that 10 percent participants also applied disinfectant after exposure, besides washing and application of water proof sterile bandage, no evidence exists that using antiseptics for wound care or expressing fluid by squeezing the wound further reduces the risk of blood borne pathogen transmission; however, use of antiseptics or disinfectants into the wound is not recommended.[40,43] Exposed DHCP should immediately report the exposure to the infection control-coordinator or other designated person, who should initiate referral to the qualified health-care professional and complete necessary reports, because multi factors contribute to the risk of infection after an occupational exposure to blood.[26]

CONCLUSION AND RECOMMENDATIONS

A thorough history should always be obtained from a patient and updated periodically. It should be a routine practice to screen the patients before the major and minor dental surgical procedure which may act as a route of cross infection in dental set up. A new pair of medical gloves should be worn for each patient; removed promptly after use, and hands are immediately washed to avoid transfer of micro organisms to other patients.[22,23,24] When performing oral surgery, masks and protection shields to protect eyes, nose and mouth be worn.[27,37,48] Placement of used disposable needles and sharps in safe containers is a must.

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