ORIGINAL ARTICLE

CROSS INFECTION CONTROL IN DENTAL INSTITUTIONS

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ABSTRACT

Cross infection is the transmission of infectious agents among patients and health care professionals in clinical or hospital setup. There are many infectious diseases those can be transmitted in dental environment. This cross sectional study was done to assess the knowledge, attitudes and current cross infection control practices among the dentists in different teaching institutions of Punjab province. All general dental practitioners and dental students in clinical departments in these institutes were asked to complete a questionnaire about cross infection control and the survey was completed in three weeks. Their response about different precautionary measures about cross infection control was noted. A total of 483 were returned out of 500 distributed questionnaires. Response rate of filling and submitting back the proforma was 96.6%. Knowledge of risk of transmission of infection was remarkably good among these dentists. There was a good trend of taking medical history from the patient. The dentists who disinfect the dental unit before seating the next patient were 62.8%. Dental health care professionals who used sterilized dental instruments on every patient were 88.6%. Dental health care professionals are at high risk for cross infection due to daily exposure to saliva, blood, aerosols or possibly contaminated instruments. The current study will contribute towards improving overall cross infection control practices among the dentists while working in clinical set up and will also benefit for prevention of cross infection among the dental health care professionals and the patients.

Keywords: *Cross infection control, universal precautionary measures, sterilization, prevention of contamination.*

INTRODUCTION

Infection is a process of tissue invasion by pathogenic microorganisms, characterized by their multiplication in the body causing tissue breakdown by their toxins to produce disease.[1] Cross infection control is the prevention of spread of infectious agents among patients and health care professionals in clinical or hospital setup.[2] Dental health care professionals should adopt standard precautions for prevention of cross infection because of high possibility of exposure to blood-borne pathogens while working with sharp instruments.[3] Cross infection in dentistry is caused by pathogens found in the oral cavity e.g. Hepatitis B and C virus, Human Immune Deficiency Virus, Herpes viruses and bacteria like Mycobacterium Tuberculosis.[2,3] Transmission of infection in dentistry can occur via infected aerosols, blood, saliva and contaminated instruments.[4,5,6] Universal precautions consider that all patients should be taken as infectious patients and apply these precautions to all patients by all dental practitioners during all dental procedures.[7,8] Most of the studies are conducted in individual centres and are done on patient's samples. But this study was based on inter hospital data and participants were dentists and not the patients. The rationale of current study was to assess knowledge and practices of cross infection control measures among dental health care professionals. This study will contribute towards improving overall cross infection control practices and prevention of cross infection among dental health care professionals and patients while working in clinical and hospital set up.

METHODOLOGY

This cross sectional study was conducted at three different dental institutions of Punjab province of Pakistan i.e. Nishtar Institute of Dentistry Multan, de'Montmorency College of Dentistry Lahore and CMH Medical and Dental College Lahore during April and May 2017. Information about the procedures used for prevention of cross-infection, attitude of participants towards different sterilization methods were collected on a preformed close ended (Yes/No) self-designed

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structured questionnaire. Participants were explained about the objective of the study and verbal consent was taken. Three house officers were deputed to distribute and collect the proforma to participants and completed the survey in five weeks. All general dental practitioners, postgraduate residents, house officers and dental students in clinical departments in these institutes were asked to complete the questionnaire about cross infection control. The questionnaire proforma contained 15 self-prepared questions (given below) so as to collect information about cross infection control measures. All the data were collected and entered in IBM SPSS Statistics version 21 and analyzed through its statistical package. Frequency distributions and percentages for all the variables were worked out and results were analyzed and presented in charts and tables accordingly.

RESULTS

Response rate of filling and returning the questionnaire proforma was 96.6%. A total of 483 were returned out of 500 distributed questionnaires. Most of the participants were house officers and dental students (3rd year and final year) working in clinical departments of teaching institutions followed by senior professionals (Demonstrators, Dental Surgeons, Postgraduate Residents, Assistant Professors, Associate Professors). Almost all of the participants knew the definition of cross infection. Many of the participants from these teaching institutions were also having their part time clinical working in their private clinics. Knowledge of dental health care professionals about cross infection, risk of transmission of infection and universal precautions was remarkably good. The relative percentages of certain safety measures among dental health care professionals are shown in Fig.1.

The dentists who disinfect the dental unit before seating the next patient were 62.8%. Dental health care professionals who used sterilized dental instruments for every patient were 88.6%. Relative distribution of percentages of different sterilization methods adopted

CROSS INFECTION CONTROL – CROSS INFECTION CONTROL PRACTICES IN DENTAL INSTITUTIONS (QUESTIONNAIRE)

Where are you working?	
Teaching hospital.	Yes/No
Private practice.	Yes/No
Do you have any idea about cross infection control?	Yes/No
Do you ask your patient about his medical history?	Yes/No
Do you wear facemask, protective eye goggles, gloves while doing patient?	Yes/No
Do you wash your hands before and after doing the procedure?	Yes/No
Do you properly disinfect dental unit before seating the next patient?	Yes/No
How do you avoid salivary contamination during working?	
By using rubber dam.	Yes/No
By using cotton roll.	Yes/No
By using high volume suction.	Yes/No
Do you have autoclaving facility in your hospital/clinic?	Yes/No
Do you sterilize your instruments after every single use?	Yes/No
Do you sterilize metallic hand piece after every single use by autoclaving?	Yes/No
or you use disposable hand piece.	Yes/No
Do you sterilize your instruments like burs, endodontic instruments and scalar tips?	Yes/No
By which type of sterilizer do you sterilize your instruments?	
Dry heat.	Yes/No
Steam sterilizer (autoclave)	Yes/No
Chemical solution.	Yes/No
Glass bead sterilizer.	Yes/No
Have you ever got needle stick injury	Yes/No
Have you got vaccination against Hepatitis B?	Yes/No
How do you send the impressions, biopsy specimen in laboratory to avoid contamination.	
In bottle.	Yes/No
In plastic bags.	Yes/No

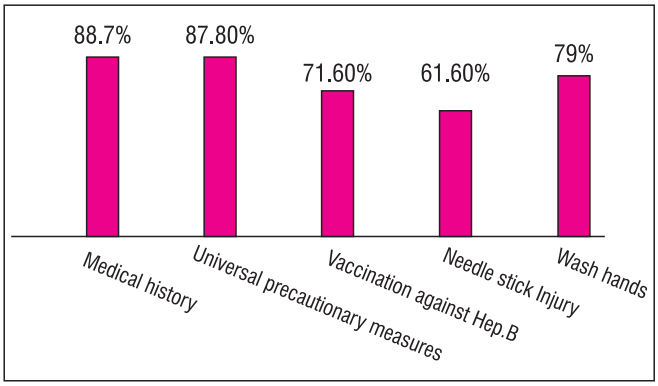

Fig1: Percentage of participants observing safety measures

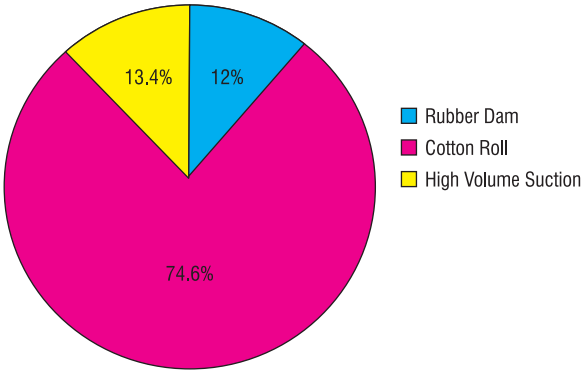

Fig 2: Methods of isolation

TABLE 1: METHODS OF STERILIZATION

Sterilization Method	No. of participants (n)	Percentage
Autoclaving	432	89.44%
Dry heat sterilization	22	4.55%
Chemical solutions	16	3.31%
Glass bead sterilizer	13	2.69%
Total	483	100%

by dental health care professionals for cross infection control is given in Table 1. The relative distributions of percentages of different methods used for isolation during working by dentists are presented in Fig. 2. Dentists used to follow sterilization rules while sending the samples (e.g. impressions, biopsy specimens) in bottles, biopsy jars, plastic bags and via other carrying sources.

DISCUSSION

Nishtar Institute of Dentistry Multan and de'Montmorency College of Dentistry Lahore are two well renowned public sector dental institutions and CMH Lahore Medical and Dental College, Lahore is a private sector institution in the Punjab Province of Pakistan. These institutions not only have undergrade and postgrade dental students in all disciplines of dentistry but also have competent and knowledgeable teaching faculty. All the dental health care professionals in these institutions are providing tertiary care dental treatment facilities to the patients presenting here. Therefore, the survey conducted in these settings was of very much importance regarding cross infection control measures.

The results of the current study show that majority of the dental practitioners are well aware of the cross infection control measures. Now a days, understanding concerning cross infection among dentists has increased because of increase in transmission of blood borne diseases. Regarding the knowledge of dentists who use to take medical history from patients shows that they are aware of risk of transmission of infectious agents to themselves as well as to the patients. All para-dental staff must follow standard guidelines of prevention and safety measures should be taken especially at the time of patient handling.[6,9] The rule of thumb is that when splash or mist is anticipated full personal protective equipment (eye wear, hair caps, gowns, masks and gloves) should be worn.[7,8,10] This was also observed in our studies that participants used universal precautionary measures and wore gloves, facemask, eye protective goggles etc.

An important factor in cross infection control is to change gloves and masks for every patient during dental treatment to prevent spread of infection from patient to patient.[6,11] In current study, participants used to adopt precautionary measures in their private practice and changed gloves before every patient but not all of them changed face mask for every patient. The findings of 90% of this study about the use of infection control measures correlate with the 94% of findings of the study from Lahore.[12]

The aim of Centre for Disease Control and Prevention (CDC) guidelines is to provide the best possible working conditions with all standard precautionary measures to prevent transmission of infectious organisms exposing dental health care professionals and their patients.[13,14] CDC recommended wearing protective goggles and properly disinfecting the clothes before reuse. Moreover, after performing chair side dental treatments hands must be thoroughly washed with antiseptic solution.[6,15] Surgical hand scrubs and health care personal hand wash have a broad range of bactericidal activity. In current study, ratio of participants who washed their hands before and after doing the patient and disinfection of dental unit before seating the next patient was 79% and 62.8% respectively. These findings are slightly less than those found in a similar study conducted in Karachi, Pakistan.[16]

In Durban, 89% dentists have autoclaves, 97% reported routine use of gloves and masks. Al-Omari and AL-Dawairi reported 81.8% who wear and change gloves during treatment and 95% who change instruments and burs between patients.[17,18] The management of dental instruments can be considered efficient as long as they are sterilized in an autoclave. Many dental instruments are categorized as critical devices and

such devices should be sterilized at the point of use.[19] In current study, 89.8% of dentists responded to have autoclaving facility. As monitoring of sterilizer is an important factor for sterilization, there is also significant evidence of cross infection because of unsterilized instruments. So sterilization of instruments is strictly recommended. Cross infection is a global problem. World-wide 300-400 million people are chronic hepatitis B carriers. The most common method of preventing percutaneous injuries is to use barrier techniques and very vigilant during the procedure and to receive a vaccination against HBV.[20] Our study shows that HBV immunization (71.6%) is nearly comparable with recent results in UK (86%immunized).[21]

In dental practice; dentists should apply all protective means and use adequate high speed suction while using rotary instruments.[22] In current study, all participants responded positively for taking cross infection control precautions while sending the samples, impressions, biopsy specimen in laboratory to avoid contamination. The knowledge and practice of dental practitioners about cross infection control measures was good but not of absolute or acceptable standards. There are no grades of sterilization; it could be either 100% or zero. Moreover, the current study was based on verbal response of participants for filling the proforma and the results can vary in actual practice.

CONCLUSION

Every patient should be screened for infectious diseases. Dental health care workers and para dental staff should be very vigilant while performing exposure prone procedures and should be vaccinated against HBV. There should be no compromises on the use of barrier techniques and sterilization of reusable instruments. Wherever possible, there should be maximum use of disposable items during dental surgical procedures.

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