

## CROSS INFECTION CONTROL

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## ABSTRACT

*The objectives of this study were to assess the level of awareness about cross infection control among dentists and to find out what measures were being taken by dental staff to avoid cross infection and to know the reasons why standard precautionary measures could not be used to curb cross infection.*

*Specially designed questionnaires were distributed among dental practitioners at two major dental hospitals, attached to Khyber College of Dentistry (KCD) and Sardar Begum Dental College (SBDC) and various private clinics throughout Peshawar, to evaluate the awareness about cross infection control and its application in a dental setting.*

*The overall response rate was 100%. According to the present study 80.5% of the dental practitioners were immunized against Hepatitis B. The verbal history taking method is predominantly adopted by most of the practitioners in the region i.e., 76.5%. Most of the dental practitioners routinely screen their patients for Hepatitis B and C i.e., 83%. They were very well aware of the sterilization methods, 93.5% were of the opinion that autoclave was the best method for sterilization. Only 40.5% of them used sterile covering and 55% disinfected the working surfaces. Examination gloves were used by majority, even for examination purpose i.e., 94%, and 92% of them handled one patient with a single pair of gloves. Mask wearing for examination purpose was noted in 68% and the numbers of masks worn in a single day were one to two masks in 63.5% of the practitioners. With regards to autoclaving of handpieces, 47.5% of the dentists autoclaved them every day. Protective Eye shield wearing at the time of surgery was often neglected by the majority of practitioners i.e., 65%. Resource deficiency was considered to be the primary reason (38%) for not following standard precautions.*

*It was concluded that the knowledge of the dental practitioners in the region was good and there was increased awareness as far as sterilization and cross infection was concerned but when it comes to practice, it is lacking. Various reasons for not practicing universal precautions were cost, resource deficiency and large number of patients.*

**Key words:** Cross infection, Sterilization, Personal Protective Equipment (PPE), Universal precautions

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## INTRODUCTION

The transfer of infectious agent from one individual to another in a clinical environment is known as cross infection.<sup>1</sup> Patients, dentists and auxiliaries of all group run risks of cross infection every time they enter the dental clinic.<sup>2</sup> The dental practitioners spend most of their time in an environment where exists a real danger of infection not only to themselves but also the potential for spread of infections to the patients which is least expected by them.<sup>3</sup> Unless precautions are taken, there is an even likelihood that patients and dental professionals will be exposed to blood-borne and other potentially pathogenic infectious agents. By understanding principles of disease transmission and using infection control practices, dental personnel can prevent cross infection.<sup>4</sup>

Every patient should be considered as potentially infectious, and the principles of infection control should be observed according to the Centre for Disease Control guidelines.<sup>5</sup> Nature of most dental procedures, instrumentation, and patient-care settings call for specific strategies directed at prevention of transmitting pathogens among dental personnel and their patients in the form of "standard precautions" i.e. sterilization, disinfection and barrier protection.<sup>6</sup> Dental Practices in Pakistan have been identified as potential risk factors in transmission of infectious diseases especially Hepatitis B and C.<sup>7</sup> Dentists, patients, and other dental staff are at great risk due to infectious diseases like AIDS, hepatitis, herpes simplex and cytomegalovirus (CMV).<sup>8</sup>

The rationale of this study was to make the dental practitioners aware about the cross infection control guidelines; because cross infection is a worldwide concern today and dentists are specially blamed for dissemination of infection due to critical nature of procedures carried out in dental environment

## METHODOLOGY

This descriptive cross sectional study was conducted at two major dental hospitals, i.e. Khyber College of Dentistry (KCD) and Sardar Begum Dental College (SBDC) and various private clinics throughout Peshawar. A total of 200 specifically designed questionnaires were distributed to evaluate the level of awareness about cross infection and its control and the

degree of its application in a dental setting. The questionnaire involved 13 questions assessing knowledge, behavior and attitudes of the dental staff towards cross infection control measures and the reasons behind not practicing universal precautions.

Practitioners in Peshawar having a degree of Bachelor of Dental Surgery (BDS) and registered with Pakistan Medical and Dental Council (PMDC) were included in the research. The exclusion criteria involved practitioners practicing in peripheral areas of Peshawar. The study protocol and the use of data for research was explained to the practitioners to get fully informed and understood consent. Results obtained from different respondents were tabulated and statistically analyzed using SPSS version 17.

## RESULTS

The overall response rate was 100%. According to the present study 80.5% of the dental practitioners were immunized against hepatitis B and most of the dental practitioners routinely screened their patients for Hepatitis B and C i.e., 83% (Fig. 1). The verbal history taking method is predominantly adopted by most of the practitioners in the region i.e., 76.5% (Fig. 2). They are very well aware of the sterilization methods i.e., 93.5% are of the opinion that autoclave is the best method for sterilization (Fig. 3). Only 40.5% of them use sterile covering and 55% disinfected the working surfaces. Protective Eye shield wearing at the time of surgery often neglected by majority of practitioners i.e. 65%. Gloves were used by majority, even for examination purpose i.e., 94% while mask wearing was noted in 68% (Table 1). Dentists handling one patient with a single pair of gloves were 92% while numbers of masks worn in a single day were one to two masks by 63.5% of the practitioners (Table 2). With regards to autoclaving of handpieces, 47.5% of the dentists autoclaved them every day (Fig. 4). Resource deficiency was considered to be the primary reason (38%) for not following standard precautions (Fig. 5).

## DISCUSSION

Cross infection control is a pertinent topic among health care workers today. Dentists in particular are very prone to such detriments due to the nature of their work. According to the results of our study 80.5% of practitioners were immunized against hepatitis B.

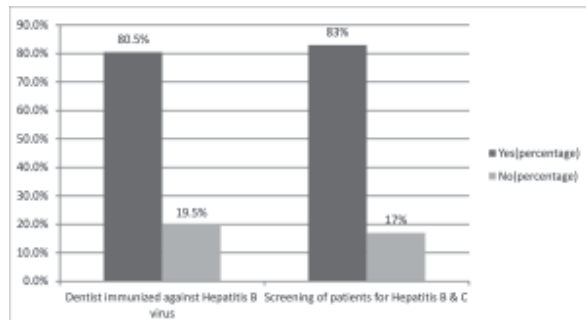


Fig 1: Immunization of dentists against Hepatitis B; Screening of patients for Hepatitis B & C

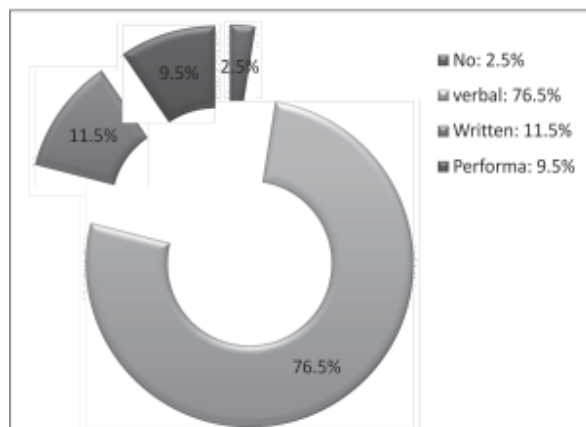


Fig 2: Methods of history taking by dentists

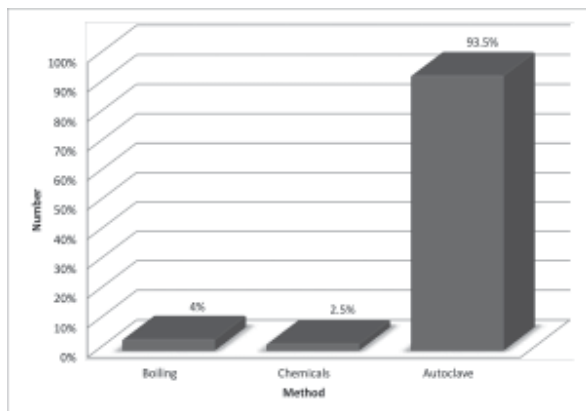


Fig 3: Methods of sterilization

TABLE 1: PRECAUTIONS TAKEN DURING TREATMENT OF PATIENTS

	Yes (percentage)	No (percentage)
Disinfect working	55	45
Sterile covering	40.5	59.5
Face mask use	68	32
Protective eyewear	35	65
Gloves used for	94	6

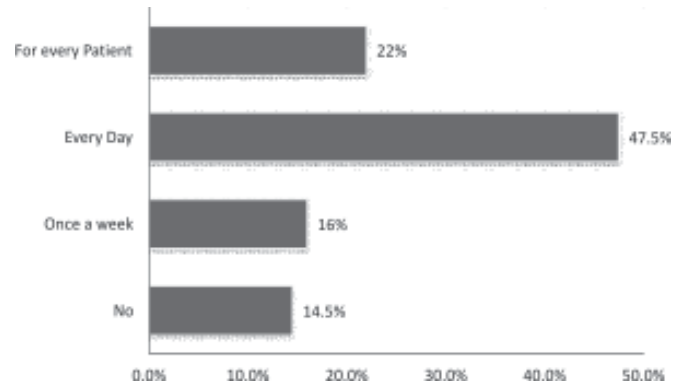


Fig 4: Hand-piece autoclaving

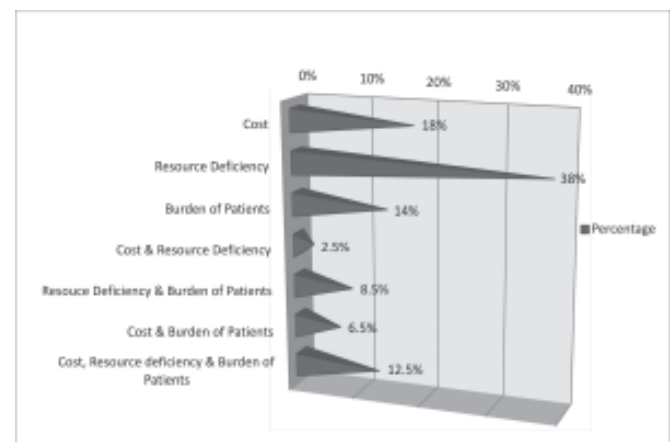


Fig 5: Reasons for not following universal precautions

These results are comparable to studies done in Berlin<sup>9</sup>. However values are much higher as compared to Lithuania (35.9%)<sup>10</sup> and Kenya (45%)<sup>11</sup> where less number of dentists were immunized against hepatitis B. This shows increased concern of dentists in our region regarding hepatitis B. However immunization status of dentists in England (97%)<sup>12</sup> and Jordan (95%)<sup>13</sup> was found to be much high. Reason may be due to the many awareness campaigns and free immunizations available for dental personnel in those areas.

This study showed that 83% of dentists routinely screened their patients for hepatitis B & C. It is a part of current recommendations to routinely screen patients for hepatitis B before having dental treatment so that necessary precautions can be taken.<sup>14</sup> It is a well-known fact that dentists are in particular vulnerable to hepatitis B and C due to the nature of procedures and instruments for dental treatment, making it vital for dentists to screen patients prior to treatment.<sup>15</sup> This high number of dentists screening their patients high-

TABLE 2: PERSONAL PROTECTIVE EQUIPMENT USAGE BY DENTISTS

Patient(s) handled with a single pair of gloves			No. of masks used in a single day		
One 92%	Two to Four 6%	Five to Ten 2%	One to Two 63.5%	Three to Five 5.5%	Depends on No. of Patients 31%

lights the concerns regarding hepatitis among dentists.

Regarding knowledge about cross infection it was found that majority of the dentists were well aware of universal precautions (masks, gloves) to be used during patient management, however the trends of using sterile coverings and disinfecting surfaces prior to treatment were found to be low among dentists. This is in general comparable to trends throughout the world where gloves and masks are preferred as a part of personal protective equipment (PPE) while sterile coverings and protective eye wear are in less common use.<sup>16</sup> It is important to increase their use as majority of dental procedures like scaling and root canal treatment exposes the dentist to a high number of microorganisms.<sup>17</sup> Other studies showed an even less number of dentists using glass protection during dental procedures as compared to our findings.<sup>18,19</sup> However studies done in well developed countries like Canada<sup>20</sup> showed an increased trend towards PPE. Reasons for this result may be the extra burden of patients and less resources allocated by government to public hospitals. Also dentists in general wrongly consider contamination from splashes a minor source of cross infection.

Another important factor related to spread of infectious agents is failure to change gloves between patients. It is important to use gloves during dental treatment in order to not only avoid contamination from patient's blood, saliva or infected instruments but also to prevent cross infection from patient to patient.<sup>21</sup> When asked about gloves use 92% of dentists stated that they treat 1 patient with single pair of gloves and this number is higher as compared to previous studies done on the matter.<sup>18, 22, 23</sup>

With regards to sterilization it was found that only 47.5% of dentists autoclaved their handpieces daily. This is less as compared to studies done in England and Holland where handpieces are routinely autoclaved by dentists<sup>24, 25</sup> however this number is more as compared

to a study done in Malaysia.<sup>26</sup> Reason may be due to the perception of dentists that frequent autoclaving may lead to malfunctioning of the hand piece. Also in public sector hospitals many practitioners use single handpiece and due to burden of patients it may be difficult to find out time for autoclaving hand piece daily.

With respect to reason for not following cross infection control guidelines, majority of dentists stated resource deficiency to be the primary cause. Limited literature is available on this subject for comparison but the result is understandable since Pakistan is a developing country and many of its areas especially Khyber Pakhtunkhwa (KPK) suffer from not only a deficiency of health care workers but also from improper utilization of resources. This has led to over burden of patients in public sector hospitals with the resultant lack of proper patient management according to international protocols of cross infection control.<sup>27</sup>

Cross infection control is becoming a global problem. Worldwide 300 to 400 million people are chronic hepatitis B carriers. It is important to make note of this problem especially among dentists as it is postulated that dentists and dental staff are a frequent cause of transmitting infections to themselves as well as to other patients.<sup>28</sup> Studies in Pakistan also show dental procedures to be the most common cause of hepatitis C transmission.<sup>29</sup>

## CONCLUSION

In conclusion the knowledge of the dental practitioners in the region is good and there is increased awareness as far as sterilization and cross infection is concerned but knowledge is all about application, thus further effort is required on the application side in order to tackle the hazard of infective diseases like HIV, Hepatitis B & C. The various reasons for not practicing universal precautions were Cost, Resource deficiency and burden of the patients.



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