

Knowledge and Attitude of Dental Practitioners in Tabriz Regarding Infection Control Procedures

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Abstract

Background and aims. Blood-borne infections such as hepatitis B, hepatitis C and HIV might be transmitted from one individual to another during dental procedures. Therefore, sterilization and personal protection procedures are of utmost significance in dental offices. The importance of awareness of cross-infection and antiseptic principles lies in the fact that in most cases it is not possible to identify patients with hepatitis or AIDS. The aim of the present study was to evaluate awareness of infection control procedures among dental practitioners in Tabriz.

Materials and methods. In this descriptive study, 150 dental practitioners working in clinics and private offices of Tabriz were randomly selected. Data was collected by means of a self-administered questionnaire, which included respondents' personal profile and questions on infection control and sterilization methods.

Results. There were no statistically significant differences in the level of knowledge between male and female dental practitioners regarding infection control; however, there was a decline in awareness as age increased.

Conclusion. The results of the present study suggest that in some cases dental practitioners neglect the principles for personal protection and cross-infection control. Therefore, our society is subject to widespread infection in dental offices and clinics. This potential risk necessitates careful monitoring along with government support of treatment procedures, the inclusion of infection control costs into treatment expenses and an emphasis on continuing education about infection control procedures through seminars and congresses.

Key words: Hepatitis A Virus, Hepatitis B Virus, Hepatitis C Virus, Human Immunodeficiency Virus, Infection Control.

Introduction

Practitioners and staff of the dental office are at a high risk of occupational hazards of infectious diseases as a result of continuous contact with infectious material during dental procedures. These conditions range from common cold to life-threatening dis-

eases such as tuberculosis, hepatitis and AIDS. Studies in the United States indicate that 14-28% of general practitioners, 13% of dental assistants and 17% of dental hygienists have already been exposed to hepatitis B. The prevalence of these infections is 2-5% in

US population.¹ These infections are transmittable via blood, saliva and aerosols. According to a WHO report, approximately 32.2 million people are infected with HIV, and 2.1 million people lost their lives because of AIDS all over the world in 2007.² In Iran, an estimated 66000 people were infected with HIV by 2006.³ Of these, an estimated 1600 people lost their lives due to AIDS. Men account for 83% and women 17% of individuals with AIDS in Iran. Approximately 64% of patients with AIDS in Iran are drug addicts, who have used contaminated needles.³

Various studies have found that the greatest number of occupational accidents during dental procedures is mainly caused by sharp instruments, which account for 55% of all dental accidents.^{4,5} Dental practitioners are at a higher risk of infection because of multiple encounters with patients which include unidentified carriers of HIV and hepatitis. One

study has found that traces of blood can be found under nails of index fingers and thumbs in 80% of dental practitioners, and they remain there until the weekend in 40% of the cases.⁶

Therefore, dental practitioners and auxiliaries must gain a sound knowledge of infection control. The aim of the present study was to evaluate awareness of infection control procedures among dental practitioners in Tabriz.

Materials and Methods

One hundred fifty dental practitioners in Tabriz were randomly selected for the purpose of this descriptive study. Thirteen subjects were specialists in the fields of periodontics, endodontics, prosthodontics and operative dentistry.

Dear colleague,
This questionnaire has been especially prepared to evaluate the knowledge of dental practitioners in Tabriz on infection control procedures.
We would be deeply grateful to you if you would assist us in our efforts to pave the way for a healthy community by answering these questions.

1. Sex:: Male Female
2. Years of job experience:
3. Resident of: Tabriz Towns around Tabriz
4. Workplace: Clinic Private practice both
5. Normally, you consider your patients ...
healthy infected suspected of infections
6. Are your secretaries and assistants vaccinated against hepatitis B?
Yes No I do not know
7. What immediate actions should be taken in case of a direct blood contact with a HIV+ patient?
 - a) Anti-AIDS immunoglobulin should be administered.
 - b) Anti-AIDS drugs such as Ziduvudine should be taken.
 - c) Blood tests should be carried out.
 - d) I do not know.
8. Do you know the odds of HIV transmission after a single contaminated needle stick injury?
 - a) 0.1% - 0.4%
 - b) 1% - 4%
 - c) 10% - 40%
 - d) 70% - 90%
9. Do you know how long hepatitis B virus remains viable on dry surfaces?
 - a) It does not remain viable.
 - b) 1 day
 - c) 10 days
 - d) forever
10. Which of the following scaling methods do you employ in patients suspected of being infected?
 - a) ultrasonic scaling devices
 - b) hand instruments
 - c) There is no difference.
11. Do you know the odds for contracting hepatitis B in each blood contact with an infected individual?
 - a) 30%
 - b) 0.3%
 - c) 100%
12. Which of the following do you use to sterilize instruments in your office?
 - a) oven
 - b) ethylene oxide gas
 - c) autoclave
 - d) none
13. What is the minimum time required for complete sterilization in an autoclave?
 - a) 5 minutes
 - b) 10 minutes
 - c) 15 minutes
14. What is the temperature necessary for complete sterilization in an oven?
 - a) 100°C
 - b) 160°C
 - c) 80°C
15. How often do you change the solution if you use glutaraldehyde to sterilize burs and files?
 - a) every day
 - b) when there is a color change in the solution
 - c) every 20 days
16. Which of the following has the highest rate of transmission via saliva?
 - a) AIDS
 - b) hepatitis
 - c) tuberculosis
 - d) I don't know.

Figure 1. The questionnaire used for this study.

Data was collected by means of a self-administered questionnaire, which consisted of 12 questions (V5-V16) to evaluate awareness of infection control. Personal particulars such as age, sex, job experience, and workplace were also included. The questionnaires were sent to dental clinics and offices in Tabriz (Figure 1). One hundred twenty-five questionnaires were returned, out of which 14 questionnaires were excluded because they were not completely filled out. Data from 111 questionnaires were analyzed using SPSS 10.0 software.

Results

According to the results of the present study there were no statistically significant differences in knowledge of infection control between male and female respondents. The results indicated that there was a decline in the practitioners' awareness parallel with an increase in job experience. The practitioners working in clinics had a higher (12%) awareness compared to practitioners in private offices. Thirty-two percent of the practi-

tioners considered all the patients as infected cases and 16% had a sound knowledge of the procedures in case of direct blood contact with HIV+ patients. Forty-three percent of the subjects had given a positive answer to the possibility of contracting AIDS subsequent to single contaminated needle stick injuries. Fifty percent of the practitioners were aware of the maximum time of hepatitis B virus viability on dry surfaces. Seventy-one percent of the subjects under study used autoclaves to sterilize equipments. Forty percent of the practitioners were aware of the effectiveness of glutaraldehyde solution on files and burs. Fifty percent of the subjects had knowledge of the infections transmittable via saliva.

In general, the highest knowledge of respondents was on the temperatures necessary for sterilizing instruments in an oven (96%) and the lowest awareness was of the actions to be taken in case of direct contact with HIV+ patients (30%). Approximately 69% of dental assistants and secretaries had been vaccinated against hepatitis B.

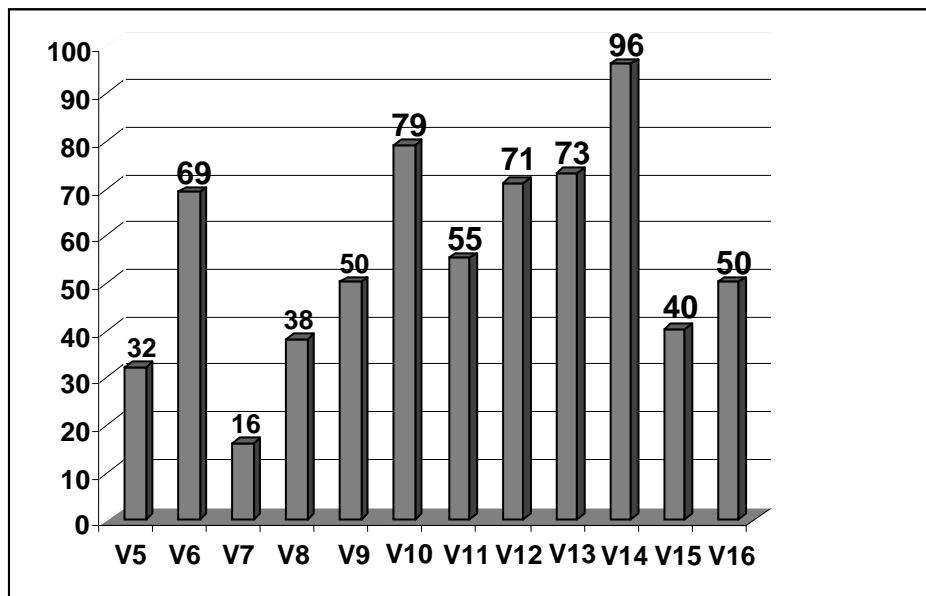


Figure 2. Frequency distribution of awareness of infection control procedures among dental practitioners in Tabriz.

Discussion

According to the results of this study, the mean awareness of infection control procedures among dental practitioners in Tabriz was approximately 57.7%, with a standard deviation of 16.9% (figure 2). According to Table 1, means of awareness of male and female dental practitioners were 57.7% and 58.4%, respectively ($t = 0.08$, $P = 0.33$), demonstrating no statistically significant differences between males and females. One study in another city found that although female dental practitioners pay more attention to sterilization, male dental practitioners are more efficient in sterilization procedures.⁴

Based on Pearson's correlation coefficient, there was an inverse relationship between awareness of infection control procedures and job experience ($r = -0.37$, $P = 0.00$), which does not coincide with the results of a study, which found that the practitioners with more job experience were more successful in sterilization procedures compared to their younger colleagues.⁶

Based on the results of the present study, it was concluded that dental practitioners working in state clinics had greater awareness of infection control procedures compared to dental practitioners working in private offices, which might be attributed to the younger population of the practitioners working in state clinics. In addition, according to the results of the present study, 32% of the dental practitioners in this study regarded all the patients as infected cases. It must be emphasized that since infectious diseases such as hepatitis and AIDS do not have any clinical manifestations in early stages, all the patients should be considered infected cases.

According to the results of the present study 69% of dental assistants were immunized against hepatitis B. Another study reported that 56.4% of dental assistants were immunized against hepatitis B.⁴ Yet another study carried out in Tehran reported that in 2001, 72.6% and in 2002, 67.1% of dental personnel were immunized against hepatitis, which is in line with our results.³

According to Occupational Safety Health Administration (OSHA) all of the dental personnel should be vaccinated against hepatitis B free of charge and within ten days of being employed.^{7,8}

The results of the present study indicate that vaccination of dental personnel against hepatitis does not conform to OSHA guidelines, which might be attributed to a lack of strict regulations regarding the employment of personnel in clinics and health centers or to disregard for regulations on behalf of dental practitioners and authorities.

The results of the present study demonstrated that only 16% of the dental practitioners had a sound knowledge of the steps to be taken in the event of direct blood contact with a HIV+ individual and that only 43% of them gave a correct answer to the possibility of HIV contracting subsequent to punctures with contaminated needles. Nearly half of the subjects under study were aware of the maximum survival time of hepatitis B virus on dry surfaces. An important finding in the present study was the fact that 30% of the dental practitioners under study believed that hepatitis B virus either survives for only a day on a dry surface or it does not survive at all, which is a disappointing finding.

Table 1. Comparison of awareness of infection control procedures among male and female dental practitioners in Tabriz

Gender	No.	Mean	Standard deviation
Male	71	57.7465	18.70031
Female	39	58.0420	13.61488

Seventy-one percent of the subjects in the present study used autoclaves for sterilization, which is different from the reported rate of 20.3% in a study in Tehran.⁴ This rate was reported to be 11.8% in a study carried out on dental practitioners taking part in a congress held by Iranian Association of Dentists in 1998 in Tehran.⁴

The differences in the results of these studies might be attributed to the diversity of the populations under study. In general, the limited use of autoclaves is attributable to its high price. In the present study 40% of the dental practitioners were aware of the instructions for use of glutaraldehyde to disinfect files and burs and 50% were aware of the infections communicated via saliva. In general, the least awareness was related to questions V8, V9, V5 and V7 and the highest awareness was related to questions V13, V12, V10, V6 and V14.

According to the results of the present study, dental practitioners have neglected the principles of infection control, and personal and personnel protection in some cases, which necessitates continuing education programs to raise awareness in this respect.

Conclusion

The results of the present study revealed that dental practitioners have neglected some infection control principles, which may result in the widespread exposure of patients to infection in dental offices and clinics. Therefore, careful monitoring along with government support for insurance coverage of treatment procedure, the inclusion of infection control costs into treatment expenses, and an emphasis on continuing education regarding infection control in seminars and congresses are necessary.

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