INFECTION CONTROL IN THE PRIVATE DENTAL SECTOR IN RIYADH

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Background: With the global rise in the number of people infected with hepatitis B and C and HIV viruses, cross infection has become of paramount concern to dental health care workers and their patients. The objective of this study was to assess the infection control practice in the private dental sector in Riyadh, Saudi Arabia.

Subjects and Methods: The study was conducted through a cross-sectional survey of private dental practices in the city of Riyadh. A total sample size of 132 dental units was chosen using the proportional allocation method. Three hospitals, 45 clinics and 39 centers were selected randomly. A self-administered questionnaire was completed by dentists working in the selected settings.

Results: Of the 206 questionnaires sent, 203 (98.5%) were completed. The mean age of the responding dentists was 36.8 ± 6.7 years. A total of 139 dentists (68.5%) were general practitioners and 64 (31.5%) were specialists. A total of 129 (63.5%) stated that they had been vaccinated against hepatitis B virus and 189 (93.1%) stated that they always took a medical history of each patient before treatment. All the studied dentists reported that they always used gloves for every patient during dental treatment, and 90.6% stated that they always wore a face mask during dental treatment. The primary source of infection control information for the studied dentists was from the colleges (78.3%). Only 37.9% of the dentists sterilized their handpieces by autoclaving, while the other 53.7% used disinfectant. About 56% disposed of used needles and sharp instruments in special safety containers. Multivariate logistic regression analysis revealed that working in clinics, age >40 years and knowledge of correct sterilization steps were independent promoting factors for adherence to infection control practice (OR=3.8, CI=1.2-12.1; OR=10.2, CI=1.61-64.8; OR=5.6, CI=1.04-29.9, respectively).

Conclusion: The development of infection control manual for dental practices, in addition to a campaign of health education for dentists in the private sector, is recommended.


Key Words: Infection control, private dental sector, dentists.
Arabia. The objective of this study was to assess the infection control practice in this dental sector in Riyadh.

Subjects and Methods

The study was conducted by the use of a cross-sectional survey. A list of 283 private dental units was obtained from the Riyadh General Directorate of Health Affairs of which a sample size of 132 units was chosen. Using the proportional allocation method, a random selection of nine units from three hospitals, 78 units from 39 centers, and 45 units from 45 clinics was made. A pre-structured self-administered questionnaire was distributed to all dentists working in the selected dental care units. The questionnaire required data on sociodemographic characteristics, knowledge and practice of infection control procedures in their units, e.g., sterilization, wearing of gloves, mask, use of rubber dam, vaccination against hepatitis B virus, method of storing instruments, and disposal methods of contaminated material.

The completed questionnaires were reviewed for completeness and consistency. Epi-Info 6.04 was used to analyze the data. An outcome variable indicating compliance with infection control procedures was generated as binary variable (compliant and non-compliant). Compliance to different procedures was presented as percentages. Crude odds ratio (OR) and its 95% confidence interval (CI) was used to present the association of studied variables with compliance. Significant associates in bivariate analysis were treated in multivariate logistic regression model to remove the confounding effects and to yield the adjusted odds ratio and its 95% CI.

Dentists were deemed to be compliant with infection control procedures if they carried out all of the following: always took medical history for each patient; have been vaccinated against HBV; always wore gloves; changed gloves after each patient; always wore facemask; changed mask after each patient or when it became moist; always wore coat; changed coat when dirty; always applied antibacterial mouthwash for patients before treatment; always used high-volume suction during any kind of dental treatment; changed extraction forceps, elevators, handpieces, saliva ejectors and burs after each patient; used autoclave, dry heat or chemicals to sterilize handpieces as appropriate; had special rigid containers to store used needle and scalpel blades; and stored the reprocessed instruments in the sterilization wrappers. Dentists were deemed to be non-compliant if they did not adhere to any of the above procedures.

Results

Of the 206 distributed questionnaires, 203 (98.5%) were completed by respondents, comprising 113 males (55.7%) and 90 females (44.3%). The mean age of the responding dentists was 36.8±6.7 years, and 62.6% belonged to the age group of 31-40 years. The dentists were of different nationalities: 77 (37.9%) were from Syria, 74 (36.5%) from Egypt, 23 (11.3%) from other Arab countries, and the remaining 29 (14.3%) from non-Arab countries. A total of 139 (68.5%) were general practitioners in dentistry while 64 (31.5%) were specialists. Over half of the dentists included in this study (123, 60.6%) were working in dental center clinics, and nearly all of them had worked in their respective countries after graduation before coming to Saudi Arabia. For approximately two-thirds of the studied dentists, their individual years of experience ranged from 6 to 15 years, with a mean of 13.2±6.1 years. Over 50% of the dentists examined 6 to 10 patients daily, while about 12.3% examined more than 15 patients daily, with a mean of 10.1±4.8 patients per day (Table 1).

Table 2 shows that 93.1% of dentists asked about the medical history of patients before giving treatment, that 63.5% had been vaccinated against hepatitis B, and 62% knew the correct sterilization methods. All the studied dentists wore new gloves and changed saliva ejector for each patient. Also, 98% changed the extraction forceps and elevator for each patient. Among the studied dentists,
56.2% used special containers for disposal of needles, syringes and extracted teeth.

Table 3 shows that 17 dentists (8.4%) were adherent to the complete list of infection control practices. Crude analysis shows that dentists working in clinics were significantly more compliant (14.9%) than those working in hospitals or centers (OR=2.23, CI=1.07-10.0). Dentists aged 40 years or under, those of Arabic descent, and those with experience up to 15 years (3.8%, 6.3% and 4.2%, respectively) were significantly less compliant than those aged over 40 years (25.6%), were non-Arab (20.7%), and those with more than 15 years experience, (OR=0.11, CI=0.03-0.36; OR=0.26, CI=0.08-0.88; and OR=0.2, CI=0.06-0.63, respectively).

Multivariate logistic regression analysis (Table 4) shows that working in clinics, age over 40 years, and knowledge of the correct sterilization procedures were independent promoting factors for adherence to infection control practice (OR=3.8, CI=1.2-12.1; OR=10.2, CI=1.61-64.8 and OR=5.6, CI=1.04-29.9, respectively).

Discussion

A variety of bacterial, viral, fungal, and protozoan microbes present hazards to the dental team and patients. They may be exposed to these microbes through direct contact with a patient’s tissues such as blood, skin, and other secretions, or by indirect contact like injuries caused by sharp contaminated instruments, or by droplet infection from aerosols and spatter.12

There are two reasons why dental health care workers must wear operating gloves: 1) to prevent transmission of infection from the operator’s hands to the patient; and 2) to prevent contact of blood and saliva with the operator’s hands.13 The present study showed that all the dentists wore gloves and 90% wore facemasks. In 1991, a study by Al Ruaimi showed that between 2%-4% of dental professionals in Saudi Arabia never wore gloves when treating patients.14 Another study by Morris et al. showed that about 90% of dentists in Kuwait wore gloves, 75% wore masks and 52% wore eyeglasses.6 From New Zealand, Treasure et al. showed in their study that 42% of dentists wore gloves, 64.8% wore masks and 66.4% wore eye protection.15 In 1994, McCarthy et al showed that 91.8% of dentists in Ontario, Canada, always wore gloves, 74.8% always wore masks and 83.6% always wore eye protection.16

Prospective studies have estimated the risk of infection from hepatitis B and hepatitis C virus infection in health care workers to be 6%-30% and 10%, respectively, after needlestick exposure.17 The prevalence of hepatitis B antigen carriers in Saudi Arabia is estimated to be 8.3% for the entire population.18 This means that dentists and their assistants in Saudi Arabia are at a high risk of exposure to hepatitis B antigen. Therefore, there should be 100% hepatitis B vaccination coverage of all dentists and dental workers, rather than the 63.5% found in this study. Similar to the present study, a survey completed in government primary health care (PHC) dental clinics on vaccination against hepatitis B found that only 70% of dentists had been vaccinated.19 The study by McCarthy et al. showed that 92.3% of dentists in Ontario, Canada, had received HBV
...dental licensing offices to these clinics. A study may be attributed to repeated visits of officers from practitioners in the private dental sector in Riyadh. A higher infection control procedures was only 8.4% among dental high-volume suction. 

bacteria of about 150 million/mL. The present study treatment room by micro-particle aerosols that contain important role in minimizing contamination of the objects.

56.2% of studied dentists had special containers for sharp objects. It is a well-defined hospital policy that such instruments should be disposed of. It is a well-defined hospital policy that such instruments should be puncture proof. All sharp instruments used in dental clinics should be safely disposed of. It is a well-defined hospital policy that such instruments should be disposed of in safe containers, and that these containers should be puncture proof. The study by Kurdy and Fontaine showed that 72% of dental clinics in PHC centers had containers for disposable instruments. The present study about 56.2% of studied dentists had special containers for sharp objects.

There is evidence that high-volume suction plays an important role in minimizing contamination of the treatment room by micro-particle aerosols that contain significant microbiologic al load. Saliva alone has bacteria of about 150 million/mL. The present study revealed that only 49.8% of the studied dentists used the high-volume suction. This study shows that the overall compliance with infection control procedures was only 8.4% among dental practitioners in the private dental sector in Riyadh. A higher rate of compliance in some private clinics shown by this study may be attributed to repeated visits of officers from dental licensing offices to these clinics.

more compliant than those in the younger age group. This may be due to more experience and knowledge acquired. Experience means more exposure to sources of knowledge and perhaps familiarity with previous infections in colleagues. Morris et al. in Kuwait showed that respondents with 10 or more years of experience were significantly more knowledgeable than the student dentists. As well, McCarthy and MacDonald showed that dentists over 40 years of age were more likely to use recommended infection control procedures than those who were under 40 years.

All the data in the study were self reported, and it is pertinent to be cautious in interpreting and generalizing the findings. The observation that very few respondents have followed the full requirements of infection control practice developed by American Dental Association (ADA) and Centers for Disease Control and Prevention (CDC), however, is significant.

The Ministry of Health has to provide formal infection control courses for the dental profession, with mandatory attendance for continued licensing. Infection control manuals for dental practice have to be developed. All published guidelines and recommendations on infection control in dental practice should be incorporated into a standard dental infection control manual. Dentists and dental assistants must be vaccinated against hepatitis B. Continuous supervision of the private dental sector is encouraged to evaluate and check the facilities for sterilization and disinfection, as well as adherence to standard procedures.

The authors would like to thank Dr. Nasser Al Bagieh, Vice-Dean, Dr. Khalid Al Wassan, General Director of Dental Clinics, and Mr. Jameel Al-Asmar, the Central Sterilization and Supply Division Supervisor of the Ministry of Health, Riyadh. Our deep appreciation also goes to the Medical License personnel (Dental department) in the office of Riyadh Health Affairs.

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