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Which Equipments Are More Infected with Hepatitis B Virus Infection? Dental Equipments or Endoscopes?

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Hepatitis B Virus infection (HBV) is a significant hazard in the dental environment and endoscopy room because the virus may be transmitted through contaminated instruments. This study was conducted in order to detect the HbsAg in the endoscopy and dental equipments and then to compare the results. In this cross-sectional study, in a time period of 30 days, 100 and 50 specimens were obtained randomly from multiple apparently sterile dental equipments and endoscopes, respectively. Obtained samples evaluated for HBsAg by ELISA method (Sorin biomedical Kit). Results of the present study shows that 2% of instruments used for dental treatment was infected with hepatitis B virus. Among 50 specimens of endoscope instruments, only one sample was positive for HBsAg. Upon our results, there might exist the possibility of HBV transmission through dental equipments and endoscope instruments. We advise the use of standard sterilization for prevention of transmission of hepatitis B virus infection.

Key words: Endoscopes, dental equipments, sterilization, hepatitis B virus antigen

INTRODUCTION

Hepatitis B Virus (HBV) infection is among the most devastating health problems in the world. Initial infection with the virus may be asymptomatic in up to 50% of cases (Alavian, 2002). An infected individual, with either symptomatic or asymptomatic acute infection, may become a chronic carrier. The fact that hepatitis may be asymptomatic contributes to its transmission (Zali *et al.*, 1996; Alavian, 2002). The route of transmission of hepatitis B is mainly parenteral, but occupational transmission and contact with infected equipments may be another route (Faridullah *et al.*, 2002). Transmission of hepatitis B Virus (HBV) to patients has been associated with health care workers who are known hepatitis B carriers, especially those with detectable hepatitis B e antigen (HBeAg) (Bond *et al.*, 1977; Anonymous, 2003a). Also, HBV transmission has been reported in a variety of health care settings, including acupuncture and dermatology clinics, operating rooms, hemodialysis units and drug trials (Anonymous, 2003b; Crawford, 1975; Hiroshi and Stephen, 2000). Medical devices such as dental instruments and endoscopes have also been associated with HBV transmission (Anonymous, 2003b; Porter *et al.*, 1994; Sun-a Lee *et al.*, 2004; Spach *et al.*, 1993). Since the infected dental equipments and endoscopes can transmit the virus to patients, we decided to determine detection rate of the hepatitis B virus in these instruments.

MATERIALS AND METHODS

In this cross-sectional, case-control survey, in a time period of 30 days in 2002s, in Zahedan (a city in Southeastern of Iran), 100 specimens were obtained randomly, using random number table from multiple apparently sterile instruments that used for the referral patients in the all dental clinics of Zahedan Medical University. Every morning, samples were obtained before that dentists treat their patients. Also, 50 samples of different sections of endoscopes, were obtained randomly from all endoscopes that used for referral patients to endoscopy clinics of Zahedan Medical University. All endoscopes samples were obtained before that the endoscopist start his or her work. Selected equipments were put in a sterile bottle full of distilled water and shaken for 5 sec. Then the specimens were sent to blood transfusion Center. Obtained samples from the bottles were measured for HBsAg by using a commercial enzyme-linked immunosorbant assay (ELISA Test, Sorin Biomedica).

RESULTS AND DISCUSSION

Our data showed 3 samples (2%) of apparently sterile equipments in dental clinics was positive for hepatitis B virus infection. Infected instruments were included; 1- Dental scaler, 2-Forceps collins, 3-Plaster double spatula. Only one sample (biopsy needle of colonoscope) in endoscopy section was positive for HBsAg.

Hepatitis B infection (HBV) is a significant hazard in the dental environment and endoscopy rooms because the virus may be transmitted through contaminated instruments (Alavian, 2002; Hiroshi and Stephen, 2000). Hence, the transmission of HBV in the dental and endoscopy environments should be prevented by the routine exercise of good clinical hygiene (Spach *et al.*, 1993). A high standard of clinical hygiene, including the routine use of disposable needles for injections, single dose containers for drugs to be injected, sterilized instruments and attention to personal hygiene before and after treating patients, is essential to prevent transmission of HBV (Spach *et al.*, 1993; Anonymous, 2003b). Evidence of an increase in the nonparenteral spread of viral hepatitis is of much concern in dentistry and endoscopy rooms supports the need for sterilization of all instruments used in the diagnosis and treatments (Anonymous, 2003b). In Deng study, the positive rate of HBsAg from dental hand pieces was 1.65% (Deng *et al.*, 2005). In Spath study, one cases of hepatitis B virus transmission via gastrointestinal endoscopy was determined (Spach *et al.*, 1994). Other study showed that the 2.2% of patients who refereed to endoscopy room, had been infected with HBV during endoscopy (Anonymous, 2003a). Our results showed that 2% of endoscopy instruments and 2% of dental equipment were infected with HBsAg and there was no any difference in prevalence of infection between dental instrument and endoscopes.

Although the Infections following invasive endoscopy are rare and are usually of endogenous origin. Nevertheless, infections do occur due to inadequate cleaning and disinfection and the use of contaminated rinse water and processing equipment (Wood, 1984; Anonymous, 2003a; Anonymous, 2004c).

Upon our results and detection rate of 2% of the hepatitis B virus infection in dental and endoscope instruments, we advise the careful monitoring of the effectiveness of sterilization in two clinics.

CONCLUSIONS

To comply with the Medical Devices Directive, manufacturers are obliged to provide full details on

how to decontaminate the reusable devices they supply. This should include details of compatibility with heat, pressure, moisture, processing chemicals and ultrasonics. Also, the Infection Control Team in hospital should always be involved in the formulation and implementation of decontamination policies.

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