IOSR Journal of Dental and Medical Sciences (IOSR-JDMS)
e-ISSN: 2279-0853, p-ISSN: 2279-0861.Volume 18, Issue 9 Ser.2 (September. 2019), PP 50-52
www.iosrjournals.org

Viral Hepatitis: Act Now / Never

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Date of Submission: 23-08-2019 Date of Acceptance: 07-09-2019

I. Introduction

Hepatitis B Virus, belonging to the Hepadnaviridae family, is a small enveloped DNA virus whose partially double stranded DNA genome is maintained in a circular confirmation.

The nucleocapsid core antigen (HBcAg) is surrounded by an outer lipoprotein coat containing the surface antigen (HBsAg). On the basis of the antibody response to HBsAg, four major subtypes of HBsAg have been recognized and designated as adw, ayn, adr, and ayr. The distribution of the four subtypes varies geographically, however because of the common "a" antigen, protection against one subtype appears to confer protection against other subtypes.

HBV infection is the most important infectious occupational hazard in the dental profession and has frequently been transmitted in dental practice. The rate of infection among dentists (general practitioners and specialists included) range from 13.6% to 38.5% and there have been cases of dentists infecting patients with HBV.[1]

Hepatitis B virus can be transmitted parenterally by percutaneous and mucous membrane exposures to infected blood, by sexual contact or by perinatal exposure. Needles and syringes may be contaminated by viruses. Accidental injuries with infected needles and syringes can transmit the virus to health care workers (HCWs). Although there is no strong evidence that saliva and gingival cervical fluid can transmit the virus, some studies show HBsAg in saliva and gingival cervical fluid of HBV-positive patients.[1]

Serological studies in different parts of the world have found a higher prevalence of HBV infection with a high potential for transmission, among dentists, especially among surgical specialities.[2] Thus this article discusses about the prevelance, knowledge and precautions to be taken by the dentists and patients and importance of preventing the infection.

II. Incidence of Hepatitis B in Dentistry

HBV infection is the most important infectious occupational hazard in the dental profession.
A number of reports suggest :
• A significantly higher incidence of HBV among dental staff
• A higher rates of HBV especially oral surgeons, periodontists and endodontists.

Vectors of infection with HBV in dental practice are: blood, saliva and nasopharyngeal secretions (Mori et al.1984). In intraorally, the greatest concentration of hepatitisB infection is the gingival sulcus (Itharatana et al. 1988). Also periodontal disease, severity of bleeding and bad oral hygiene were associated with the risk of HBV.[3]

The prevalence of HBV infection is higher among dentists than the general population, especially among those who have surgical specialties the occupational risk of HBV infection through contaminated blood in piercing/cutting accidents among dentists varied between

6% and 30%. In addition, other body fluids such as saliva and crevicular fluid have the HBV and could be ways of transmission. The adoption of individual protection measures and the vaccination of workers who come in contact with blood, other body fluids and piercing/cutting instruments or contaminated surfaces are recommended to prevent occupational HBV transmission.[4]

To transmit HBV from HCWs to patients, the HCW must be infected and have an infectious virus circulating in the bloodstream, the HCW must be injured or have a condition such as weeping dermatitis or eczema that provides direct exposure to infected blood or body fluids, and finally the injury mechanism or condition must present an opportunity for the HCWs blood or body fluids to directly contact a patients mucous membranes, wound or traumatized tissue

HBV has the 30% risk of seroconversion following a sharp injury involving a high risk carrier to a susceptible individual. Although infection rates have declined considerably in dental staff as a consequence of immunization and improvements in infection control practices. However, there is evidence in the recent

literature that there are significant groups of health care workers worldwide who do not receive appropriate hepatitis B vaccination. Dental personnel who either have not completed a course of hepatitis B immunisation, or who are non-responders to the vaccine, are at significant risk of infection. For such individuals, the possible need for prophylaxis with hepatitis B immunoglobulin following a needle stick injury must not be overlooked.[5]

From 1972 to 1999, 46 HCWs (including six DHCPs) transmitted HBV to their patients: a general dentist transmitted to 13 patients , an oral surgeon to 55 patients during 42 months , a general dentist to at least six patients , an oral surgeon to 52 patients causing clinical illness developing in 12 patients, an oral surgeon to 62 patients during a period of 9 months and a general dentist to four patients Since 1987, there have been fewer documented cases of HBV transmission from dentists to patients. This decrease has been attributed to increased use of gloves, greater care in handling sharp instruments and HBV vaccination . [6]

Although standard precaution programmes have existed for many years, outbreaks still happen in various nations, because of the procedures conducted in a dental office, there is a high risk of needlestick and percutaneous injury in dentists and dental staff. If dentists acquire the infection, they will be an important source for transmission to their patients. The probability of cross-infection should be imprinted in all dental personnel minds. Applying precautionary methods is still the only method to reduce the probability of outbreaks in dental clinics.

III. Knowledge of dentists

During normal dental practice, dentists are at risk of infection from micro-organisms carried by patients . Injuries in dental offices happen because of a confined space, the frequent patient movement and the variety of sharp dental instruments used in normal dental practice . In dentists opinion, infection with HBV is still the most dangerous blood-borne disease . Studies from different parts of the world show that dental HCWs have totally different levels of knowledge about viral hepatitis transmission and about prevention and infection control programmes.[7]

The probability of infection decreases significantly by using infection control strategies. The Canadian dental association (CDA) and the American dental association (ADA) have stated it is unethical for a dentist to refuse to treat a patient solely on the grounds that the person has a blood-borne virus or any other transmittable disease or infection. The associations stated that these patients may be treated safely in dental offices if the vaccinated dental staff follows recommended infection control practices . It is necessary to conduct clinical research to observe and monitor dental occupational injuries and infection control knowledge and practices among dental health care personnel (DHCP). The research provides continuous assessment for the efficacy of vaccination, infection control education and training programmes, and it assists in the development of educational interventions to improve.[8,12]

IV. Knowledge of patients

Patients attendance in dental clinics exposes them to two risks: first, the probability of cross-infection from one patient to another from an infected dental instrument; and second, the potential hazard of an infected dentist . Because of HBV vaccination, the infection rate has decreased significantly. Because of extensive HBV vaccination, it can now be claimed that transmission from a HCW to a patient is unlikely .

V. Prevention

Despite vaccination against HBV, many physicians are still reluctant to conduct dental procedures on HBV-infected patients . Because of negative reactions from dentists (for example, not treating or admitting in the last working hours), patients often hide their infection from dentists . In spite of such studies, there are also reports that state there are many dentists who work on HBV-positive patients. In 1976, a study showed that approximately 50% of dental surgeons had knowingly treated HBV-infected patients, and some dentists had treated patients with HBV infection many times. However, these dentists also believed they had always taken appropriate precautions . A study from Taiwan revealed that approximately 75% of dental students would treat an HBV-positive patient.

The recommendation to use universal precautions systems from the necessity of treating all patients, although they are infected with HBV, HCV or HIV. Thus, additional precautions for infected patients are unnecessary . Dental surgeons, who wear glasses and work with ultrasonic and rotary instruments, are aware of the amount of droplet spread of saliva, blood and water because of deposits on their glasses.[6]

Indeed, it is essential for dental HCWs to have a good knowledge of disinfection systems to eliminate the risk of cross-infections . Furthermore, strict sterilization procedures must be used to prevent infection transmission . Most dentists have a needlestick or puncture of finger skin once or more each week . Dentists are among the most highly exposed groups of HCWs . Reusing local anaesthetic syringes following recapping, and cleaning instruments were the two most important causes of needlestick injuries in dental students and dental

hygienists . It should be emphasized that HBV transmission can occur in dentistry if there is any lapse in sterilization procedures or if there is transmission of infected body fluids to patients . It was also demonstrated that the risk of the spread of infections through the use of inadequately sterilized instruments is much higher than that by blood transfusion.[6,7]

Currently, vaccination is the most important method of preventing HBV infection. The object of vaccination against HBV is not only to prevent infection, to reduce the incidence of persistent HBV infection and chronic liver disease, but also to eliminate the pool of chronic carriers, which limits the transmission of infection to susceptible patients . The main reason reported for not being vaccinated or not being completely vaccinated was lack of information.[5,9]

An effective vaccine is available to protect ourselves from HBV. The course consist of three doses.
1. First dose at an elected date – injected into the arm muscle during the first visit
2. Second dose after one month
3. Third dose after six months after the first dose
4. Booster dose after five years.

It is advisable to check for Hepatitis B antibody titer 1-2 months after third dose of vaccination.
Antibody (HBs Ag) response should be positive and should be atleast 10ml U/ml. In case of antibody response is less than 10ml U/ ml or negative then a 3 dose vaccine series is repeated.[5,9]

HBV is primarily transferred to the dentist through direct contact with blood or saliva i.e., through microlesions in an ungloved hand or handling contaminated instruments. There is a possibility of inoculation of infected blood through needle stick type of injuries to the hands by sharps, or alternatively entry may be via existing microlesions on ungloved hand.[12]

To help prevent the spread of cross infection by this route, the routine wearing of gloves, during treatment of patients has been advised by many authorities. In addition, Wearing protective eye glasses and mouth mask will help prevent spluttering of aerosol and auxillaries. It is mandatory to wear protective clothing like apron while seeing a patient so as it protects the regular dress from splatter of contaminants. It will also prevent the family member coming in contact with these contaminants through our clothes.[10]

Most dentists obtain a medical history of a prospective patient before initiating doctor-patient contact. These histories include direct questions concerning past hepatitis infection, and general questions regarding whether the patient ever had a blood transfusion or renal dialysis. Unfortunately medical histories present an ineffective means for diagnosing hepatitis.

Each operatory must have a rigid approved and a labeled sharps container. Immediately after patient care, all sharps must be placed into the sharps container safely and then discarded into colour coded bags. They were then should be regularly removed and terminally incenerated at a remote facility by a professional contract waste management company.[10,11]

VI. Conclusion

Dentists and dental staffs in clinics should prepare an environment, where infected patients can be treated easily and safely. Applying sterilization methods effectively and using disposable instruments will reduce the probability of cross-infection. Dental staff will be able to treat patients safely if they are vaccinated and routinely evaluate their anti-HBs status, if they use barrier techniques and if they are familiar with postexposure protocol.

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