Sero prevalence of hepatitis B infection among dental professionals

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ABSTRACT

Background: Hepatitis B virus (HBV) infection is a global public health problem, especially to health care personnel including dentist.

Materials and methods: Sixty – seven Iraqi dental professionals are participated in this study, filled out questionnaire record of past and present history of infection with HBV, immunization against HBV, blood transfusion, surgical operation. They reported time spent in profession and numbers of patients contract daily with them, and absence or presence of preventive measure.

Results: Serological test for detection of (HBs Ag and anti HBs Ag, anti HBc IgM and anti HBc IgG) for each dentist had been alone. The result showed that 78.9% of dentists had get immunization against HBV that was determined by presence of anti HBs marker in their sera. A recovery state from previous infection reported in two dentists with positive anti HBs Ag and anti HBc IgG marker. The results showed no significant correlation between positive presence of HBV markers and the time spent in profession.

Conclusion: Four dentists have positive sero HBV markers reported of non – using a protective measure.

Keywords: Hepatitis B, serology.

INTRODUCTION

The term “Hepatitis” is used to describe a common form of liver injury. It simply means inflammation of the liver. There are many causes of hepatitis include alcohol, poisoning substance, certain drugs and viruses (1, 2).

Several different viruses causes viral hepatitis, they are A, B, C, D, E and G viruses (3). Hepatitis B virus (HBV) infection is a global public health problem. It is estimated that there are more than 300 million HBV carriers in the world; of whom one million will die annually from HBV – related liver diseases (4). Infection with the hepatitis B virus can lead to a range of clinical illnesses characterized by fever, nausea, abdominal pain, lack of appetite and yellowing of the skin. Acute hepatitis can be severe with symptoms lasting for many weeks or months and is much less commonly life – threatening or fulminant in which the liver is so badly damaged that it can no longer function (5). Most people with acute hepatitis B recover uneventfully; however, in 5 percent of adults the virus makes it self at home in the liver, where it continues to make copies of itself for many years.

People who continue to harbor the virus are referred to as “Carriers” while liver damage associated with long standing infection is referred to as “Chronic hepatitis”.

Chronic hepatitis B develops more commonly in people who are infected with the virus at an early age, such as at birth (4).

Most infected patients, even those with progressing disease, have no specific symptoms for many years. However, the absence of symptoms does not necessarily mean that the infection is under control.

All people who have chronic infection with hepatitis B are at increased risk of developing complications that include the development of liver cirrhosis and liver cancer (6). There is no seasonal trend for HBV infection and no high predilection for any age group although there are definite high risk groups such as parenteral drug abusers, health care personnel (Surgeons, pathologists, dentists, nurses, blood bank personnel), multiply transfused patients, organ transplant and hemodialysis patients (7, 8).

Transmission of HBV takes place in newborn infants born to mothers with hepatitis B at time of delivery by maternal – fetal transfusion and exposure to maternal blood in birth canal and postnatally through close mother – baby contact (9). Transmission of HBV can occur by detecting of HBVAg in saliva, naso-pharyngeal washings, semen, and vaginal secretions as well as blood (10).

Diagnosis of HBV infection (11, 12) is based on clinical, laboratory and epidemiological findings. Definitive diagnosis depends on the results of serologic markers of HBV will vary depend on the infection state.

HBsAg is the most commonly test for diagnosis of HBV infections or detecting carriers. It can be detected early as 1 – 2 weeks or as late as 11 or 12 weeks after exposure. The presence of HBsAg indicates active viral replication.
regardless of whether the infection is acute or chronic.

**Anti HBs** (surface antibody) is a protective neutralizing antibody. The presence of anti – HBs following acute HBV infection generally indicate recovery and immunity from re-infection. Anti – HBs can also be acquired as an immune response to hepatitis B vaccine.

**Anti HBe** (Core antibody) develops in all HBV infections, appears shortly after HBsAg in acute disease and indicate HBV infection in past. Anti – HBe does not develop in person whose immunity to HBV is from vaccine.

**IgM anti HBe** this marker indicates recent infection with HBV and is the best serological marker for acute HBV infection.

**IgG anti HBe** It persists along with anti – HBs in patients who recover from acute hepatitis B. it also persists in association with HBs Ag in those who progress to chronic HBV infection.

**HBe Ag and Anti HBe** is a secretary protein, processed from precore protein. It is a marker of HBV replication and infectivity.

### HBV infection and dentists

Dentists, like other health care workers make an overt effort to protect themselves and their employees from infectious agent present in the body fluids of their patient (13). Many dentists don’t understand that hepatitis B infection poses a great threat to their lives and health than acquired immunodeficiency syndrome. Recent reports of the transmission of viral hepatitis specially HBV in health care setting has been shown that transmission occur from patient to patient, patient to health care worker, and from health care worker to patient (14). The use of improper sterilized medical or dental equipment and accidental punctures with contaminated instruments may be the cause of the transmission of recommendations for dental practice include sterilizing of extraction forceps, wearing gloves, mask and receiving of hepatitis B vaccine (15).

### MATERIALS AND METHODS

Sixty-seven Iraqi dental professionals are participated in this study. They filled out questionnaire record past or present history of the followings

1- Infection with HBV
2- Immunization against HBV
3- Blood transfusion
4- Surgical operation

5- Contact with a case of hepatitis.

They reported also the time spent in the profession and number of patients contact daily with them. Other questionnaires were concern with absence or presence of preventive measure (wearing gloves and mask during dental work).

### Collection of samples

Blood sample is collected from each dentist; remove the serum from the clot as soon as possible. The samples must be frozen (-20°C) to store for longer periods until the serological test is done.

Serological test for detection of HBs Ag and antibody against HBs Ag (anti HBs Ag) are done by using the Biotest elisa HBs Ag and anti HBs Ag (Biotest) which is an enzyme immuno – assay test non-competitive sandwich test based on the ELISA principle and its applications for the qualitative determination of HBs Ag and anti – HBs Ag.

Serological test for the detection of anti HBe IgM and anti HBe IgG are done by using Bioelisa test anti HBe IgM (Biokit) which is ELISA test for detection of IgM antibodies against hepatitis B core antigen in human serum or plasma and Bioelisa test anti HBe IgG (Biokit) for detection IgG antibodies against hepatitis B core antigen in human serum or plasma.

### RESULTS

Sixty-seven Iraqi dentists from Baghdad are involved in the present study. Males represent 44.7% of total number of shared dentists, their average age is 43.5 years, while female represent 55.2% of total number with average age 40 years (table, 1).

Historical review of possible sources of infection with HBV show in table, 2, As 78.9% of dentists had get immunization against HBV (20 males and 25 females). Two dentists out of 67 had a history of contact with a case of hepatitis B virus, while other six dentists, had history of surgical operation.

Four dentists have recorded a history of blood transfusion. The remaining ten dentists had no history of any possible cause of infection with HBV.

Table (3) show that 37.3% of the involved professional dentists have taken a preventive measure from HBV infection by wearing mask and gloves, while 10.4% of them have wore...
The present study showed that two dentists have a positive (HBs Ag, and anti HBe IgG) markers in their tested sera which indicated a carrier state or in a chronic state of infection. Historical records revealed that these two dentists had a previous history of blood transfusion and surgical operation which indicated the way for the transmission of HBV infection. This result is coincidence with Thomas et al findings in 1996 (20) who reported a serological marker of HBV infection in 7.8% of general dentists assayed by enzyme immuno – assay and recombinant immuno – blot assay, Thomas et al showed the occupational risk for HBV and HCV infections among general dentists and oral surgeons.

This study found other two dentists with positive anti HBs Ag and anti HBe IgG which indicated a recovery state from previous infection. These two cases had a history of contact with a case of hepatitis B virus. This result is in agreement with Vadivate et al's results in 1992 (21) and Lewis et al's results in 1992 (22). The four dentists out of forty nine who showed a positive sero HBV markers have reported of non using a protective measure (wearing mask and gloves), although the result is of no statistical significant value, but it represent a highlighted point of importance for the protective measure to be a factor in risk of transmission of hepatitis virus from physician to patients.

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The present study revealed that forty five dentists had a history of vaccination against HBV that supported the serological test findings that showed 45 dentists had positive anti – HBs in their sera without any other markers. These findings are in agreement with Aspinall et al's results in 1991 (18) who evaluated the immune response in dental personnel vaccinated with HBV vaccine and determined anti – HBs marker in their sera. Chobe et al in 1991 (19) highlighted on the importance of vaccine for prevention of hepatitis B infection among dental personnel.

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Table (1): Distribution of age and sex in sixty-seven dentists.

<table>
<thead>
<tr>
<th>Sex</th>
<th>NO.</th>
<th>%</th>
<th>Average age</th>
<th>Average time spent in profession(year)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>30</td>
<td>44.7</td>
<td>43.5</td>
<td>13.5</td>
</tr>
<tr>
<td>Female</td>
<td>37</td>
<td>55.2</td>
<td>40</td>
<td>16</td>
</tr>
<tr>
<td>Total</td>
<td>67</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table (2): History of possible source of infection with HBV.

<table>
<thead>
<tr>
<th>Possible source</th>
<th>Male</th>
<th>Female</th>
<th>Total</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contact with a case of hepatitis</td>
<td>0</td>
<td>2</td>
<td>2</td>
<td>3.5</td>
</tr>
<tr>
<td>Vaccination</td>
<td>20</td>
<td>25</td>
<td>45</td>
<td>78.9</td>
</tr>
<tr>
<td>Surgical operation</td>
<td>4</td>
<td>2</td>
<td>6</td>
<td>10.5</td>
</tr>
<tr>
<td>Blood transfusion</td>
<td>3</td>
<td>1</td>
<td>4</td>
<td>7.01</td>
</tr>
<tr>
<td>Total</td>
<td>27</td>
<td>30</td>
<td>57</td>
<td></td>
</tr>
</tbody>
</table>

Table (3): Preventive measure used in 67 dentists.

<table>
<thead>
<tr>
<th></th>
<th>Wearing gloves only</th>
<th>Wearing mask only</th>
<th>Gloves &amp; mask</th>
<th>NON</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>30</td>
<td>3</td>
<td>2</td>
<td>15</td>
</tr>
<tr>
<td>Female</td>
<td>37</td>
<td>4</td>
<td>5</td>
<td>10</td>
</tr>
<tr>
<td>Total</td>
<td>67</td>
<td>7</td>
<td>7</td>
<td>25</td>
</tr>
<tr>
<td>%</td>
<td>100</td>
<td>10.4</td>
<td>10.4</td>
<td>37.3</td>
</tr>
</tbody>
</table>

Table (4): Sero HBV markers in dentists.

<table>
<thead>
<tr>
<th>NO. of tested</th>
<th>%</th>
<th>HBs Ag</th>
<th>Anti – HBs Ag</th>
<th>Anti – HBc IgM</th>
<th>Anti – HBc IgG</th>
</tr>
</thead>
<tbody>
<tr>
<td>45</td>
<td>91.8</td>
<td>-</td>
<td>+</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>2</td>
<td>4.08</td>
<td>+</td>
<td>-</td>
<td>-</td>
<td>+</td>
</tr>
<tr>
<td>2</td>
<td>4.08</td>
<td>-</td>
<td>+</td>
<td>-</td>
<td>+</td>
</tr>
<tr>
<td>49</td>
<td></td>
<td></td>
<td></td>
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</tbody>
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