Hepatitis B Antigenaemia in Hospital Based Population of Faisalabad.

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Accepted: August 20, 2007

Abstract
The objectives of the present study was to find out the prevalence of hepatitis B virus (HBV) infection and risk factors associated with the disease in the patients attending out patient department (OPD) of ‘Madina Teaching Hospital’ University Medical College, Faisalabad from May 2005 to April 2007. All patients residing in the Faisalabad city and its suburbs were asked about their consent for the inclusion in the study and finally, a group of 3096 non vaccinated subjects were screened initially against HBV followed by confirmatory test of ELISA. HBsAg immuno-chromatographic kits were used to screen the blood of 3096 subjects with a positivity rate of 50.74% (n=1571). All the subjects found positive after screening (n=1571) were confirmed through ELISA test with a positivity rate of 1.55% (n=48). A significant by higher reactive rate was in OPD visiting male gender (2.22 %) as compared to females (0.85). The increasing trends with the advancement of age have been observed in both the sexes. Exposure to HBV infection was highest (1.53 %) in those in the age group of 30-39 years and zero % in the age group of < 10 years when upon analyzing the results of this study, it was revealed that the number of HBV infected subjects isolated is rather low in this region but the given figure is alarming. Mass vaccination of all neonates and school going children and high risk individuals is recommended to reduce the HBV infection carrier pool, in the coming years.

Key Words: HBsAg, Hepatitis B Antigenemia, Hospital Based Population, Vaccination, Perinatal transmission, Madina Teaching Hospital, Faisalabad

Introduction
Since its discovery during World War II, infection by hepatitis B virus (HBV) has become a major health issue globally causing considerable morbidity and mortality from both acute infection and chronic sequelae including chronic hepatitis, cirrhosis and liver cancer. Over 2 billion people show evidence of past or current HBV infection and more than 350 million people are chronic carrier’s world wide. About three quarters (%) of the world’s population lives in regions with high levels of infection. WHO estimates that over 5 million new hepatitis B virus infections occur yearly. HBV has been ranked as one of the top 10 leading causes of infectious disease deaths world wide with 1 to 2 million deaths per year from HBV associated chronic hepatitis, cirrhosis or liver cancer. The risk of developing chronic HBV infection is closely related to age at the time of infection. The average adult with acute disease spontaneously recovers with only 5% developing chronic infection, whereas 90% of HBV infected infants (from mother to child transmission) develop chronic infection with only 10% suffering acute disease from which they then recover. Hepatitis B virus infection is a global public health problem. This disease is most common in the Southern Europe, Africa, Middle and Far East and the means of transmission varies according to the region. About 15 to 20 % of acute hepatitis B cases are acquired from a known infected contact and could have been prevented by timely pre- or post- exposure prophylaxis.

HBV is usually transmitted by parenteral route through infected blood or blood products or by sexual contact and is present in saliva, semen and vaginal secretions. In Europe and US, it is now mainly spread via sexual intercourse and parenteral route while in many developing countries; almost all children are
infected by mother to infant transmission.\textsuperscript{1,3} HBs Ag positive mothers may transmit HBV to their neonates at the time of delivery; the risk of chronic infection in the infant is as high as 90 %. HBV is highly prevalent in homosexuals and I/V drug users, but most cases reported in the USA, now result from heterosexual transmission.\textsuperscript{1,2,5} Other groups at high risk include medical and paramedical staff in hospitals, clinics, clinical laboratories and blood banks.

Hepatitis B virus is able to survive for up to 7 days outside the human body. It is 50–100 % more infectious than HIV.\textsuperscript{3} The incubation period of HBV is 6 weeks to 6 months (average 12-14 weeks). Primary HBV infection in susceptible (non-immune) hosts can be either symptomatic or asymptomatic. The latter is more common than the former, especially in young children. Most primary infections in adults, whether symptomatic or not, are self-limited, with clearance of virus from blood and liver and the development of lasting immunity to reinfection.\textsuperscript{1,3,5,6} Symptoms of acute infection begin to develop when the HBs antigen level rise to peak. About 80% of adults are unaware of their disease.

Early symptoms of chronic liver disease are often ignored or the association with the liver disease is not recognized which may lead to serious complications. Persons with chronic hepatitis B, particularly when HBV infection is acquired early in life and viral replication persists, are at substantial risk of cirrhosis and hepato-cellular carcinoma (25- 40%).\textsuperscript{3,5,6}

**Objectives:**

Present study was conducted to

1. Find out the prevalence rate of HBV infection in the randomly selected subjects attending ‘Madina Teaching Hospital’ and
2. To evaluate any age and sex differentiation in the prevalence rate of HBV infection in the above subjects and
3. To determine the potential risk factors for transmission of HBV infection.

**Subjects and Methods**

In the present study, 3096 randomly selected subjects, attending ‘Madina teaching hospital’, Faisalabad were screened for Hepatitis B and include subjects of both genders and all ages. Sterile disposable syringes were used to collect blood samples for HBsAg serology and other routine tests.

**Immunoassays:**

Sera were separated and analyzed on the same day. HBsAg immuno-chromatographic kits were used to screen blood. The results were recorded as ‘Reactive or Non- Reactive.’ The results of 50 randomly selected reactive, weakly reactive and non-reactive sera were subjected to cross check and were confirmed using ELISA technique.

**Statistical analysis:**

All statistical calculations were carried out with computer software programme ‘SPSS version 12.0’. The qualitative results were analyzed using the chi-square test. Statistical significance- p > 0.05 (insignificant) and p < 0.05 as significant.

**Results**

A total of 3096 persons comprising of 1571 males and 1525 females were included in the study. 50.74 % of the subjects were male and 49.25 % were female. 48 (1.55 %) individuals were found reactive for HBs antigen [Table 1]. A higher percentage of male subjects (2.22 %) showed sero-positivity for HBsAg, the main serologic marker for hepatitis B virus infection as compared to females (0.85 %). The difference was significant (p value < 0.05). The Female: Male Ratio was 1: 2.69 [Table 2, 3]. Exposure to HBV infection was highest in those in the age group 4 (1.53 %) and zero % in age group 1 [Table 2]. The youngest baby included in our study was two (2) months old. The only significant risk factors for HBV exposure was a previous history of therapeutic injections and advancing age. EIA technology was found to be more sensitive in detecting HBsAg compared to ICT technique; however, statistically difference in results was insignificant (p>0.05) between the two techniques used.
Table 1: Frequency of HBs Ag Reactive cases

<table>
<thead>
<tr>
<th>Sex</th>
<th>Subjects screened</th>
<th>No.</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>1571 (50.74 %)</td>
<td>35</td>
<td>2.22</td>
</tr>
<tr>
<td>Female</td>
<td>1525 (49.25 %)</td>
<td>13</td>
<td>0.85</td>
</tr>
<tr>
<td>Total</td>
<td>3096</td>
<td>48</td>
<td>1.55</td>
</tr>
</tbody>
</table>

Table 2: Age group of subjects screened for HBs Ag.

<table>
<thead>
<tr>
<th>Age Group</th>
<th>Age (Years)</th>
<th>Subjects Screened</th>
<th>HBs Ag reactive cases</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group 1</td>
<td>&lt; 10</td>
<td>94</td>
<td>0</td>
<td>00</td>
</tr>
<tr>
<td>Group 2</td>
<td>10-19</td>
<td>242</td>
<td>5</td>
<td>2.06</td>
</tr>
<tr>
<td>Group 3</td>
<td>20-29</td>
<td>357</td>
<td>4</td>
<td>2.12</td>
</tr>
<tr>
<td>Group 4</td>
<td>30-39</td>
<td>448</td>
<td>12</td>
<td>2.67</td>
</tr>
<tr>
<td>Group 5</td>
<td>40-49</td>
<td>747</td>
<td>7</td>
<td>0.93</td>
</tr>
<tr>
<td>Group 6</td>
<td>50-59</td>
<td>1208</td>
<td>20</td>
<td>1.65</td>
</tr>
<tr>
<td>Total</td>
<td>3096</td>
<td>48</td>
<td></td>
<td>1.55</td>
</tr>
</tbody>
</table>

Table 3: Sex wise distribution of HBS Ag reactive cases
Discussion

The frequency of HBV infection in this study is less than that reported in many previous studies from Pakistan where HBsAg marker was reactive in 1.55% of cases and nearly equal to that reported from Egypt. This is different from results from countries in South East Asia and Saudi Arabia where a large percentage of chronic carriers were noted to be children and which has resulted from perinatal transmission.1-4,18,19

A lot of studies have been conducted globally on different population groups to detect HBsAg and other HBV markers in the blood but most of the reported studies were conducted on blood donors and the frequency of HBV infection was found to be very low in healthy blood donors as compared to professional and paid donors. The prevalence rates in healthy blood donors are 0.01-0.02% in the UK and Northern Europe, 1.0-1.5% in Southern Europe and 6.5% in parts of sub-Saharan Africa.1-4 In Pakistan, reported studies show wide variations ranging from as low as 1.52% to as high as 8.4% in healthy blood donors9-17 and prevalence of up to 25% in patients of hepatitis.16

Like other countries, most of the studies from Pakistan, collect data from blood banks that represents only healthy population- predominantly young male blood donors, so these results cannot be applied to the general population for the very obvious reason. Our study represents a hospital based population that may show an actual prevalence in Faisalabad, a textile city of Pakistan.

The silent nature of the disease prompts the need for early detection – particularly for those receiving or donating blood or planning surgery. Hepatitis B surface antigen (HBsAg) is the primary diagnostic marker for HBV infection. Of greatest concern is the development of mutant strains that can be more difficult to detect and therefore can result in a false negative test result. High specificity and sensitivity of hepatitis B markers will help to minimize the risk of further transmission by ensuring that those infected with hepatitis B virus are identified as early and as accurately as possible. Clinical laboratories assaying blood specimens for HBV are now increasingly required to recognize the different genotypes and subtypes and detect very low levels of HBsAg.7,8

Immunization is one of the most important strategies to control hepatitis B infection and is recommended for children and adults who are at risk for acquiring HBV infection. Preventing HBV infection in women of childbearing age prevents transmission of infection to infants and eliminates risk to the woman of HBV infection.18,19

Conclusion

It can be concluded that prevalence of HBV infection is rather low in the studied population but the silent nature of the disease prompts the need for early detection – particularly for those receiving or donating blood or planning surgery. The results of this study further indicate that vertical/perinatal transmission is not the likely mode of HBV infection in this region. Hopefully, introduction of blood screening and mass
vaccination of neonates and school going children and high risk individuals would further reduce the HBV carrier pool and transmission of infection especially to medical and paramedical staff in the coming years.

Sources of Financial Support:

- Acknowledgments

We are grateful to the Chairman, Madina Teaching Hospital and University Medical College, Faisalabad for providing funds for this study.

Conflict of interest: None

References

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