

## Seropositivity of Hepatitis B Surface Antigen among Jaundice Children

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### ABSTRACT

**Objective:** To determine the frequency of Hepatitis B Virus antigen among jaundiced children admitted in pediatric unit.

**Materials and Methods:** A total of 180 children, aged 1-15 years admitted with jaundice in the hospital were included from Jan-2022 to May-2022. While children pre-vaccinated against Hepatitis B as these children are pre-diagnosed for negative HVB antigens or children suffering from any kind of malignancy e.g. hepatocellular carcinoma or gastro-intestinal carcinoma were excluded. Blood samples were taken from every children by a phlebotomist and were sent to the central laboratory of the hospital for HBV detection. Enzyme-linked Immunosorbent Assay (ELISA) test was used to confirm diagnosis of seropositivity of HBV.

**Results:** The mean age study was 8.89+4.13 years. There were more males as compared to females in this study. There were 115 (63.9%) males and 65 (36.1%) females. The mean duration of jaundice in this study was 13.6+10.25 days. Hepatitis B virus infection was diagnosed in 33 (18.3%) patients. HBV antigen was detected in 26 (22.6%) males and only 7 (10.8%) girls (p-value 0.04).

**Conclusion:** Children with jaundice have a greater risk of hepatitis B virus seropositivity (18.3%). Male children are more likely than females to get infected with HBV.

**Keywords:** Jaundice, Hepatitis B, Seropositivity.

### INTRODUCTION

Both industrialized and developing nations have significant challenges due to hepatitis, which is a major public health concern. The incidence of hepatitis B virus (HBV) infection varies greatly from one nation to the next and even from one region to another within a single nation. The infection caused by the hepatitis B virus has been linked to a number of factors, including behavioral, host, and environmental factors.<sup>1</sup> It is estimated that between 350 and 400 million people around the world are living with a chronic infection caused by the hepatitis B virus, of which approximately 80 percent are Asians.<sup>2,3</sup> The incidence of the hepatitis B virus in normal populations in North America and Europe is approximately 1/1000. Every year, HBV infects between 10 and 30 million people around the world, the vast majority of whom are children and adolescents.<sup>4</sup>

The HBV is a significant factor in the development of acute or chronic liver disease, and it is also a significant contributor to global mortality and morbidity.<sup>1,5</sup> In underdeveloped nations like Africa and Asia, over 2 billion people have indicators of present or previous HBV viral infection.<sup>6</sup> These are people who have had the infection at some point in their lives. And each year, roughly 15–25 percent of these people end up passing away as a result of chronic liver infections. The inefficient control of HBV infection in poorer countries is mostly attributable to socio-economic variables and an underdeveloped health care system.<sup>7</sup> Even in the absence of parenteral risk factors, infections with HBV can result in deadly illnesses such as liver cirrhosis and hepatocellular carcinoma.<sup>8-10</sup> HBV can be transferred by blood transfusions, very close contacts such as overcrowding, sexual encounters, and the use of shared needles.

Martin et al. discovered a prevalence of HBV infection ranging from 1 to 15 years old in 24 percent of children who were hospitalized with jaundice.<sup>3</sup> However, we were unable to locate large number of studies in Pakistan that focused on diagnosing the prevalence of HBV in the youngsters of our nation. Therefore, we intend to carry out this research in order to determine the prevalence of HBV infection in children who have been hospitalized because of jaundice.

### MATERIAL AND METHODS

A total of 180 children, aged 1-15 years admitted with jaundice in the hospital were included from Jan-2022 to May-2022. While children pre-vaccinated against Hepatitis B as these children are pre-diagnosed for negative HVB antigens or children suffering from

any kind of malignancy e.g. hepatocellular carcinoma or gastro-intestinal carcinoma were excluded. An informed consent was taken from the parents of all children.

Enzyme-linked Immunosorbent Assay (ELISA) test was used to confirm diagnosis of seropositivity of HBV.

The version 16 of SPSS was used to perform the analysis on the data. The age of the children, the levels of serum bilirubin, and the length of time they had jaundice were used to compute the mean and standard deviation. We determined the frequency of each gender as well as the percentage of those who tested positive for the hepatitis B virus antigen.

### RESULTS

The mean age study was 8.89+4.13 years. There were more males as compared to females in this study. There were 115 (63.9%) males and 65 (36.1%) females. The mean duration of jaundice in this study was 13.6+10.25 days. Patients with jaundice had mean blood bilirubin levels of 8.09+2.91 mg/dl.

Regarding seropositivity of hepatitis B virus infection. Hepatitis B virus infection was diagnosed in 33 (18.3%) patients (Figure 1).

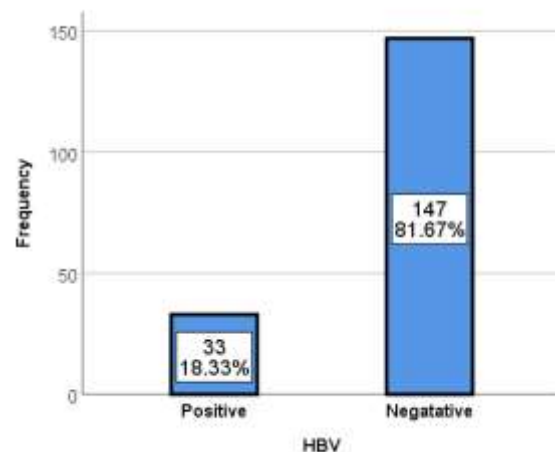


Figure 1: Frequency of Hepatitis B Virus Infection.

On the basis of their ages, the youngsters were separated into three distinct groups (from 1-5 years, 6-10 years and 11-15 years). There were 12 (20.3%) children in the age range of 1 to 5 years old who were HBV positive. In addition, there were 11 (17.5%) children in the age range of 6-10 years old who were HBV positive, and there were 10 (17.2%) children in the age range of 11-15 years old who were HBV positive (P-value 0.88). HBV antigen was detected in 26 (22.6%) males and only 7 (10.8%) girls (p-value 0.04) [Table 1].

Table 1: Association of age and gender with HBV infection.

|                   | Hepatitis B |            | P-value |
|-------------------|-------------|------------|---------|
|                   | Present     | Absent     |         |
| <b>Age Groups</b> |             |            |         |
| 1-5 Years         | 12 (20.3%)  | 47 (79.7%) | 0.88    |
| 6-10 Years        | 11 (17.5%)  | 52 (82.5%) |         |
| 11-15 Years       | 10 (17.2%)  | 48 (82.8%) |         |
| <b>Gender</b>     |             |            |         |
| Male              | 26 (22.6%)  | 89 (77.4%) | 0.05    |
| Female            | 07 (10.8%)  | 58 (89.2%) |         |

## DISCUSSION

Infection with the herpes simplex virus is a worldwide health concern that places a progressively greater burden on emerging nations like Pakistan.<sup>11</sup> There is a high disease burden in Pakistan from hepatitis A to E, with the highest morbidity rates associated with hepatitis A and E and the highest fatality rates associated with hepatitis B, C, and D. It has not been possible to locate an epidemiological research or a pattern of HBV transmission that is representative of all of Baluchistan's geographical areas. The current investigation was started with the intention of determining the prevalence as well as the common risk factors that are found among the youngsters of the region that was being researched.<sup>11</sup>

After HEV, HBV is the second most prevalent cause of acute viral hepatitis in Pakistan. HEV is the most common cause. The presence of HBsAg is the only serologic marker that may be detected in newly infected individuals within the first three to five weeks following infection. This is because HBsAg is only produced by individuals who have an active HBV infection.<sup>12</sup> In the three to four months following successful treatment for HBV infection, HBsAg is typically cleared from the blood, and anti-HBs antibodies are produced. There is a wide range of variation in the prevalence of HBV infection over the world, and its endemicity can range from high (8 percent) to intermediate (2-7 percent) to low (2 percent).<sup>13</sup>

In the course of our research, we discovered that the incidence of HBV was 18.3 percent in jaundiced patients. The prevalence of HBV infection was found to be 24.0 percent in children who presented with jaundice in a study that was carried out in Kathihar, India, by Madani et al. and Livramento et al. It has reported that the prevalence of HBV in healthy children is 0.22 percent in Saudi Arabia and 0.76 percent in Brazil respectively.<sup>14,15</sup> Many other countries have also reported a similarly low prevalence of HBV in healthy children. On the other hand, the frequency of HBV is extremely high among children with jaundice.

In our study, there were more males (74.5%) than females (25.5%) who tested positive for HBV infection. This fit with the work form. In 2002, Naz et al. found a high prevalence in men (68.3 %) compared to women (31.7%), which is pretty identical to our findings.<sup>16</sup> In 2007, Mansoor et al. reported a 64 percent male to 36 percent female predominance.<sup>17</sup> In 2009 and 2010, Moosa et al. and Awan et al. respectively reported a higher pervasiveness in men (59.1 percent and 58.3 percent) than in women (40.9 percent and 41.7 percent).<sup>18,19</sup> Zubair et al. discovered a higher 54 percent prevalence in men than in females (46 percent) while determining the recurrence of hepatitis B infection in children with chronic liver disease in 2010.<sup>20</sup> Males may be more susceptible to infection than females because they work outside the home, frequent barbershops, and participate in blood transfusion procedures. According to societal, cultural, and religious inclinations and influences, women are mostly involved in household activities.

Age has a considerable impact on the incidence of hepatitis B virus infection, according to Khan et al. In their study, the prevalence of HBV increased from teenage girls aged 11 to 20 to 13.39 percent to a peak of 34.93 percent and 23.83 percent in individuals aged 21 to 30, respectively. After that, it dropped to 16.13 percent and 7.09 percent among those between the ages of 41 and 50 and 60, respectively. While only 1.49 percent and 1.65 percent of people in the very young 0–10 year old and very old >60 year old age groups, respectively, had Hepatitis B virus infection. For individuals whose ages were unknown, the age-related infection prevalence was 1.49 percent.<sup>21</sup> According to Alam et al. those between the ages of 21 and 40 had the highest infection rates, followed by people between the ages of 41 and 60.<sup>22</sup> According to the Castolo et al. data, patients under the age of 40 have a greater prevalence of HBV infection.<sup>23</sup> Young respondents' higher rates of HBV infection may be related to their increased social engagement and exposure compared to children and older respondents. Because we only included children in our investigation, there was no effect of age on the frequency of HBV infection.

Hepatocellular carcinoma (HCC), the fifth most frequent solid tumor worldwide, is also largely caused by chronic HBV infection. Incidence and prevalence of HCC are rising in Pakistan, Europe, and the United States, and HCC treatment expenses will keep rising.<sup>24</sup> Therefore, the medical profession faces a challenge in creating more efficient and affordable treatments for viral hepatitis and its associated consequences.<sup>25</sup> Interventions to lower the frequency of HBV infections could therefore have a significant positive impact on the economy.

The results of our study indicate that children with jaundice had a high seroprevalence of HBV infection. These findings underline the necessity of preventive measures, such as educational activities in addition to the universal childhood HBV vaccination, to further reduce the morbidity and mortality as well as the economic impact of the disease. These precautions include HBV vaccination initiated at birth to prevent perinatal HBV transmission.

## CONCLUSION

Children with jaundice have a greater risk of hepatitis B virus seropositivity (18.3%). Male children are more likely than females to get infected with HBV.

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