FREQUENCY OF HBeAg POSITIVITY IN PATIENTS WITH HEPATITIS B INFECTION IN TEACHING HOSPITALS OF PESHAWAR

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ABSTRACT

OBJECTIVES: To determine the frequency of acute and chronic hepatitis HBeAg positivity in patients of different ages and gender suffering from Hepatitis B Virus infection, and to rectify the key factors responsible for its transmission.

METHODOLOGY: Cross sectional study conducted for duration of 3 months at tertiary care hospitals of Peshawar on 220 patients suffering from hepatitis B infection that are screened for serum markers. non probability convenient sampling technique was used and structured questionnaire was used as data collection tool. Patient's record was checked for serum markers. Data collected was analyzed by SPSS version 16.

RESULTS: Out of total 220 cases with hepatitis B infection 145 were male while 75 were females. 103(46.8%) were found to be positive with raised level of serum marker HBeAg, predominantly more in male gender and young age patients with mean age of 22 years. The serum level of (HBeAg) was high in patients having chronic hepatitis as compare to acute hepatitis. Patients with positive HBeAg were significantly associated with raised level of ALT.

CONCLUSIONS: The frequency of HBeAg+ve in patients suffering from hepatitis B infection is 46.8% with more predominant in young age patients associated with raised level of ALT.

RECOMMENDATIONS: Health education of the community regarding preventive measures from hepatitis B infection and early diagnosis through mass screening program is recommended.

KEY WORDS: Serum marker HBeAg, acute hepatitis, chronic hepatitis, incubation period, ALT.

INTRODUCTION

Hepatitis means inflammation or acute parenchymal liver damage of the liver which could be due to viral infections (hepatitis A, B, C, D & E), toxins (alcohol, certain drugs, some industrial organic solvents), hereditary (Wilson's disease) and autoimmune diseases. Hepatitis lasting less than six months is acute while if it lasts six months or longer, it is chronic¹.

Chronic Hepatitis B is associated with high mortality and morbidity especially when the liver enzymes, HBeAg and viral load are raised. HBeAg positivity and high viral load is associated with decreased life expectancy. HBeAg positive cases can be complicated by cirrhosis liver, Hepatocellular Ca, ascites and hepatic encephalopathy².

The main serum markers of Hepatitis B are HBsAg (Hepatitis B Virus surface antigen), HBsAb (HBV surface antibody), HBeAg (HBV e antigen), HBeAb (HBV e antibody), HBcAg and HBcAb. The incubation period (time from the acquisition of HBV to the onset of clinical symptoms) typically consists of 8-12 weeks³.

Hepatitis B surface antigen (HBsAg) is the first serum marker which appear 1 to 12 weeks (average, 30 to 60 days) after infection, followed by HBeAg. HBeAg is the qualitative diagnostic marker of HBV infection. HBeAg is actively secreted from HBV infected hepatocytes, appears in acute infection soon after HBeAg⁴. HBeAg is associated with high infectivity, active replication of virus, high ALT level and increased viral load (quantitative diagnostic marker of viral

replication)⁵. HBV DNA appear before HBsAg or HBeAg, with HBV levels often exceeding 10⁹ virions/ml⁶.

Chronic hepatitis B can be subdivided into HBeAg positive and HBeAg negative chronic hepatitis B. *HBeAg seroconversion* is the loss of HBeAg and detection of anti-HBe in a person who was previously HBeAg positive and anti-HBe negative. *HBeAg reversion* is the reappearance of HBeAg in a person who was previously HBeAg negative, anti-HBe positive⁷.

Perinatal hepatitis B transmission is common in highly endemic countries and strongly associated with Hepatitis B "e" antigen (HBeAg) positivity of childbearing women. The antigen can cross the placental barrier, but almost all perinatal infections occur during delivery⁸.

HBeAg positivity means active viral replication and an evidence for starting anti-viral therapy⁹. Hepatitis B virus infection is causing serious disease in 2 billion people out of which 360 million people have chronic infection. In Asia-Pacific region nearly half of HBV transmission is from mother to child or vertical and the remaining transmission is mostly horizontal from mother, father or siblings to the young children. Globally, highest HBeAg prevalence of over 50% was found in 0-9 years old girls. At reproductive age, HBeAg prevalence was 20-50%¹⁰.

There was an overall decrease in HBeAg between 1990 and 2005, which was more among girls in Oceania (23.3% decline), South and South-East Asia (14% decline). However, prevalence remained high at 67% among young females in 2005. Smaller decreases were observed in women at reproductive age, at which 24-32% of all HBsAg-positive women were HBeAg-positive in 2005, with lowest prevalence in Southern Sub-Saharan Africa and highest prevalence in Oceania and South-East Asia. Intrauterine infection is the main cause of maternal-infantile transmission of HBV. The intrauterine infection rate of HBsAg - positive pregnant women is 5-40%¹¹.

The first survey on the prevalence of hepatitis B and C in Pakistan conducted from July 2007 to May 2008 by Ministry of Health, Statistics Division, Federal Bureau of Statistics (FBS) and Pakistan Medical Research Council (PMRC). Overall prevalence of hepatitis B (HBsAg) was 2.5%. Overall HBeAg positivity was 14.4% with 17% in Balochistan, 15.3% in Sindh, 14.1% in Punjab and 8.4% in KPK. For HBV the prevalence figures were 2.5% in Sindh, 2.4% in Punjab, 1.3% in KPK and 4.3% in Balochistan. In KPK high HBV prevalence was seen in Upper Dir (5%), Lower Dir (3.2%) and Bannu (2.7%)¹². Male to Female ratio of HBeAg is 73.2:26.8% in Pakistan. The purpose of this study is to find out the frequency of HBeAg positivity in patients of different ages and gender suffering from Hepatitis B Virus infection and to identify the common routes of transmission of HBV in our setup, so that measures can be taken to prevent its spread.

METHODOLOGY

It was a Cross sectional study conducted for duration of 3 months from 1st December 2012 to 28th February 2013. Target population was patients visiting tertiary care hospitals of Peshawar. The study population was patient suffering from hepatitis B infection attending out of the target population. Sample size was 220 (calculated on the basis of prevalence of disease from studies conducted, using WHO sample size calculator) and those patients who were screened for serum markers were included in the study. Patients with any co infection with hepatitis were excluded from the study. Non probability convenient sampling technique was used.

A standard questionnaire was used as data collecting tool. Patients were interviewed after an informed consent was taken.

The study variables were age, sex, socio economic status, general health, UN awareness, hepatitis BeAg positivity, history of injections and invasive procedures, iv drug addicts, and health care workers.

A pilot study was carried out on 10% of the patients to check the feasibility and applicability of the

questionnaire as well as to assess the analysis of the data. The result of pilot study was not included in the study.

The data collected was processed and analyzed by SPSS package version 16 and results were presented in form of tables and graphs.

Person's chi square test was used as the statistical tool for testing the significance of relation between the variables. A P value of < 0.05 was considered significant.

RESULTS

Out of the total 220 HBV infected cases 103 (46.8%) are HBeAg +ive while 117 (53.2%) are non-reactive as shown in the table 1. Mean age of the patients having positive HBeAg is 22 years.

Out of the total 220 cases 145 males and 75 females with a 2:1 ratio for males and females. The Frequency of positive HBeAg cases in males is 70/145 (48.72%) while in females the frequency is 33/75 (44%) as shown in the table 3. These results show that not only HBV infection is more common in males but the Active Hepatitis is also predominantly more common in males.

Out of the total 220 cases when history was taken 70 (31.8%) cases were found to be Acute Hepatitis B infection (Hx of less than 6 months duration) while 150 (68.2%) cases were found to be suffering from Chronic Hepatitis (Hx of more than 6 months duration) as shown in Table 4. The frequency of HBeAg positive in acute cases was found to be 29/70 (41.42%) while it was 74/150 (49.33%) in chronic cases as shown in table 4.

Out of total 220 HBV infection cases, ALT is raised in 121 (55%) cases and out of 103 HBeAg positive cases ALT is raised in 73 (70.87%) cases with p-value less than .05 (.000), which shows a significant association between positive HBeAg cases and raised ALT.

To rectify the common modes of transmission of HBV infection, apart from many other factors close contact with infected family members, history of injections and infusions, dental

treatment and shaving practices outside their homes, were the main factors found to be responsible for the transmission.

Frequency of HBeAg positivity in HBV Infected Patients (Table 1)

HBeAG	Frequency	Percent
Non-Reactive	117	53.2
Reactive	103	46.8
Total	220	100

Sex wise distribution (Table 2)

Sex	Frequency	HBeAg Reactive
Male	145 (65.9%)	70 (48.72%)
Female	75 (34.1)	33 (44%)
Total	220	103

Frequency of Patients with Acute and Chronic HBV Infection and their HBeAg Status (Table 3)

Duration	Frequency	HBeAg Status
Less than 6 Months (Acute)	70 (31.8%)	29 (41.42%)
More than 6 Months (Chronic)	150 (68.2%)	74 (49.33%)
Total	220	103

DISCUSSION

Our study reveals that out of the total 220 HBV infected cases 103 (46.8%) are reactive for HBeAg predominantly more in young males. This percentage is quite high as compared to the results of other studies conducted by other researchers at national and international level¹³, the reason for this high positivity of HBeAg could be due to the fact that the study was mainly conducted at specialized clinics where most of the patients came through referral chain and were thoroughly investigated.

Globally, highest HBeAg prevalence of over 50% was found in 0 – 9 years girls. At reproductive age, HBeAg prevalence was 20-50%. Prevalence was highest in young females in East Asia in 1990 (78%)¹⁴

Patients with HBeA g-positive chronic hepatitis (median 40, range 36-45 years) and are mostly males^{15,16}. The probable reason for more predominant cases in young males could be due to the involvement of male gender of this age group in different social contacts, frequent visits to the

barber shops and use of injections for addiction.

Out of total 220 HBV infection cases, ALT is raised in 121 (55%) cases and out of 103 HBeAg positive cases ALT is raised in 73 (70.87%) cases. In a study conducted in Sweden, nine of the 13 HBeAg-positive cases and only 7 of the 27 anti-HBe-positive cases had elevated Alanine Transaminase (ALT) levels¹⁷. Reason for this high percentage of raised ALT in our study with a significant p-value of less than .05 could be due to inclusion of high percentage of chronic active hepatitis cases in our study whose liver functions were already compromised.

Our study shows that the most common routes of transmission are close contact with infected family members, history of injections and infusions, dental treatment and shaving practices outside their homes. The same findings were found in the literature for the route of transmission of Hepatitis B infection.

Other studies showed that transmission can occur by using the same syringe as an infected person, from blood transfusions prior to 1975 (now screened in most countries), having tattoos or body piercing, from mother to child during childbirth, during medical procedures, occupational exposure, during sexual intercourse¹⁸. Another study shows results similar to our study with Family history of liver disease was significantly higher (43% and 34%), majority 74% cases had their shaves done at communal barbers, very strong association of the disease was found with history of dental treatment (36%), history of taking injections for various ailments by the general practitioners (over 90% patients) and surgery (14%).

CONCLUSIONS

Our study demonstrated that 46.8% of hepatitis B virus infected patients are HBeAg +ive.

There is more male predominance and most of the patients are young with mean age of 22 years.

The frequency of Chronic Active Hepatitis is more than Acute Hepatitis.

There is a strong positive association of raised ALT with Active Hepatitis.

Close contact with infected family members,

history of injections and infusions, dental treatment and shaving practices in communal barber shops are the main routes of transmission.

RECOMMENDATIONS

Community health education about hepatitis B infection, its routes of transmission and preventive measures through mass media and by health personnel. The re use of disposable syringes and infusion sets must be discouraged. Vaccination against hepatitis B should be made available at subsidized rates to the community.

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