Original Article

Frequency of Hepatitis B Virus Infection among Children with Chronic Liver Disease

Muhammad Zubair, Zahid Mahmood Anjum, Sadia Zafar, Muhammad Shamaoon, Ghulam Raza Balouch

ABSTRACT

Objectives: To determine the frequency of Hepatitis B Virus infection and clinical profile among children with chronic liver disease

Study Design: Descriptive, Cross sectional Study.

Place and Duration of Study: The study was conducted in the Department of Pediatric Medicine Allied Hospital Faisalabad from 1st June 2007 to 31st May 2009.

Patients and Methods: The data of all patients admitted with chronic liver disease during the study period was recorded for age, sex, gender, risk factors, and socioeconomic factors, duration of disease, clinical signs and relevant investigations.

Results: A total of hundred patients with chronic liver disease were studied. Among them 54% were male and 46% were female. 15% of patients had positive history of blood transfusion. Hepatitis B Seropositivity was found to be 30% in children with chronic liver disease tested by HBsAg in serum.

Conclusion: Chronic HBV infection is serious viral disease that can lead to cirrhosis and hepatocellular carcinoma. Hepatitis B Vaccine should be given to all neonates regardless of maternal HBsAg status to prevent the disease.

Key words: HBsAg, Seropositivity, Chronic liver disease, Children.

INTRODUCTION

Hepatitis B virus (HBV) is one of the few known non-retroviral viruses which employ reverse transcription as a part of its replication process. HBV is largely transmitted through exposure to bodily fluids containing the virus. This includes parentral, sexual and perinatal routes[1] (by vertical transmission).

Hepatitis B virus infection occurs in hepatocytes in the liver with release of infectious virions and non-infectious empty surface antigen particles into the blood stream.[2] Although fulminant hepatitis may occur in 1% of cases of acute hepatitis but the main problem of HBV infection is its chronicity, as defined by hepatitis B surface antigen (HBsAg) carriage for more than 6 months.[1]

Hepatitis B virus infection is a global health problem. According to a study over 350 million people are chronically affected world wide[3] and over one million die annually of HBS-related chronic liver disease[4]. Although many individuals achieve a state of non replicative infection (carrier state) but almost 40% of patients develop cirrhosis, liver failure or hepatocellular carcinoma.[4] It is one of major health problem in developing countries like Pakistan.[5]

Despite the easy availability of hepatitis B vaccination, hepatitis B virus (HBV) infection is still prevalent world wide and accounts for significant morbidity and mortality.[6] Patients with chronic HBV infection are at greater risk of developing complications such as liver failure and hepatocellular carcinoma.[6] Liver failure is rare but life-threatening condition affecting a multitude of other organ system, most notably the brain and kidney, following Severe hepatocellular injury.[7]

Rationale of this study is that it will help to determine the frequency of hepatitis B virus infection and clinical profiles among children with chronic liver disease in this region of country.

As it is a preventable disease and in future suitable measures could be taken to prevent the spread of HBV infection.

MATERIAL AND METHODS

Study was conducted at the Department of Paediatric Medicine, Allied Hospital and Punjab Medical College Faisalabad over a period of two years starting from 1st June 2007 – 31st May 2009. 100 cases of chronic liver disease were included in the study.

Inclusion Criteria:
All the children of either sex having age between one to fourteen years admitted in the ward or evaluated in the OPD cases with chronic liver disease during the study period were included.

Exclusion Criteria:
Patients having chronic liver disease due to hepatitis C infection or metabolic and obstructive causes were excluded from the study.

Chronic Liver Disease was defined as presence of peripheral stigmata like clubbing, jaundice, palmer erythema, hapatomegaly / shrunken liver and splenomegaly or presence of elevated liver enzymes for more than six months in the absence of clinical signs. All the patients were thoroughly evaluated by taking history from attendants including name, age, gender, socioenomic status, duration of disease. All the relevant investigations including blood counts, liver function tests, prothrombin time, serum albumin, abdominal ultrasound and hepatitis B Seropositivity by ELISA technique S/cerolupalsmin and HCV antibodies were done.

Statistical analysis was conducted using statistical package for social sciences (SPSS). The level of $P<0.05$ was considered as being significant.

RESULTS

Hundred patients were studied over a period of two years. Among them 20% patients were having age 1-5 years and 60% patients were 6-10 years old (Table-I). Fifty four percent were male and 46% were female. Fifty percent patients were having low socioeconomic status, 35% belonged to middle class while 9% were from high socioeconomic status. Regarding the risk factors for HBV infection (Table-II) 15% had history of blood transfusion frequency. General physical and systemic signs of chronic liver disease is shown in Table-III. Regarding investigations of chronic liver disease HBV positive patients, serum bilirubin was not raised in any of our patient (Table-IV). Hepatitis B Seropositivity was found in 30% of children of chronic liver disease tested by HBsAg in serum (Table-V).

Table1:
Age Distribution in 100 Cases of Chronic Liver Disease

AGE IN YEARS	NO. OF CASES	PERCENTAGE (%)
1-5	20	20%
6-10	60	60%
11-14	20	20%

Mean age 8.1450 Standard Deviation 2.7352

Table2:
Frequency of Risk Factors of HBV Positivity in 100 Cases of Chronic Liver Disease

RISK FACTORS	NO. OF CASES	PERCENTAGE (%)
Family history of such disorder	6	6%
Children of HBV positive mothers	1	1%
History of blood transfusion	15	15%
Vaccination history	4	4%
History of bleeding manifestation	0	0%

Table3:
Frequency of General Physical and Systemic Signs in 100 Patents of Chronic Liver Disease

SIGNS	CASES	PERCENTAGE (%)
Pallor	30	30%
Palmer erythema	22	22%
Jaundice	45	45%
Spider naevi	2	2%
Gynaecomastia	3	3%
Clubbing	2	2%
Testicular atrophy	1	1%
Bleeding tendency	20	20%
Prominent veins	11	11%
Ascites	40	40%
Hapatomegaly	60	60%
Splenomegaly	30	30%
Hepatic encephalopathy	20	20%

Table4:
Frequency of Investigation in 100 Cases of Chronic Liver Disease

INVESTIGATION	NO. OF CASE	PERCENTAGE (%)
Serum Bilirubin	0	0%
Alanine Transferase	60	60%
Alkaline phosphatase	52	52%
Serum albumin	80	80%
PT	18	18%
APTT	18	18%

Table5:
Frequency of HBsAg Seropositivity in 100 Cases of Chronic Liver Disease

HBsAg	NO. OF CASES	PERCENTAGE (%)
Positive	30	30%
Negative	70	70%

The P-Value for HBsAg Seropositivity was 0.00%

DISCUSSION

This study showed that highest number of patients of chronic liver disease, 60% were found between age group 6-10 years, 20% were between 1-5 years and same were true for age group of 11-14 years. Mean age was 8.14 years and this is comparable to the work of wasim Jaffri and other colleagues in Agha Khan University Karachi.[8] Regarding the sex distribution of chronic liver disease there were more male patients. This was compatible with work form Blumberg BS [9]. Regarding the risk factors of hepatitis B, our 6% patients had positive family history of HBV infection in mother. This is comparable to the work of Lok AS and colleagues in the University Of Hong Kong Queen Mary Hospital [10]. History of blood transfusion was present in 15% patients. Only four percent children had undergone Vaccination of HBV. This was also observed by Shanker and colleagues in the University of Madras.

Among the general physical signs, Jaundice was present in 45% of patients followed by pallor 30%, palmer erythema 22%, Gynaecomastia 3% spider naevi and clubbing in 2% of patients. Similar finding were noted in different studies reported form West Indies[11], USA[12], France[13], Turkey[14] and Germany[15].

Among the systemic signs, Hepatomegaly was noted in 60% of patients, Ascites in 44%, splenomegaly in 35%, hepatic encephalopathy in 20% and prominent veins in 11%. Among the lab parameters Alanine Transferase was raised in 60%, alkaline phosphatase in 52% but none of our patient had raised serum bilirubin level. This was also noted by William and colleagues in the University of West Indies.[11]

In the end hepatitis B Seropositivity was found in30% (n=30) of children of chronic liver disease tested by HBsAg in serum. This is comparable to the work of Tahir Salim Khan and Farhat Rizvi in Ayub Medical College.[5] In another study carried out in Vietnam which is another developing country like Pakistan, CLD due to HBV was 47%.[16] In Africa the third most common cause of death in medical wards was due to liver disease. Hepatitis B was the commonest cause of liver disease, with 15-60% seropositivity for HBsAg in the normal population.[17]

Our findings are slightly lower than those shown in previous studies carried out in Pakistan, where HBV seropositivity was present in 52.85% cases of CLD and 22.64% cases of cirrhosis.[18] In contrast in developed countries like Italy cirrhosis due to HBV infection was found only in 4.4% of the patients tested.[19] Our result are somewhat different from the study conducted by Wasim Jafri and other doctors in Aga Khan University Karachi in which only 1.8% children were positive for HBsAg that may be due to the fact that HBsAg was checked as a screening test in children and in our study it was checked specifically in normal children with chronic liver disease[8]. P-value of HBsAg in children of chronic liver disease in our study is 0.000, it means the study is significant.

CONCLUSION

Chronic hepatitis B is a serious viral disease that in the absence of care can lead to cirrhosis and hepatocellular carcinoma. There is need to educate general population regarding HBV infection and its risk factors because it is quite prevalent in developing countries due to poor health facilities and it can be prevented by effort. Hepatitis B vaccine should be administered to all newborns regardless of maternal HBsAg status. However, it would be reassuring to have more of such studies on large scale to confirm these findings further.

REFERENCES

1. Pol S. Epidemiology and natural history of hepatitis B. Rev Partat.2005; 55: 599-606

2. Huang CF, Lin SS, Ho YC, Chen FL, Yang CC. The immune response induced by hepatitis B virus principal antigens. Cell Mol Immunol.2006; 3: 97-106.
3. Bielawski KP, Stalke P. Molecular epidemiology of chronic Hepatitis B virus infection in northern Poland. J Clin Virol.2005; 304: 63-9
4. Wright TL. Introduction to chronic Hepatitis B infection. AM J Gastroentrol.2006; 101: 1-6
5. Khan TS, Rizivi F. Hepatitis B seropositivity among chronic liver disease patients in Hazara division Pakistan. J Ayub Med Coll Abottabad 2003; 15: 54-5.
6. Pan CQ, Zhang JX. Natural history and clical consequences of Hepatitis B virus infection. Int J Med Sci.2005; 2: 36-40
7. Bauer M, Winning j, Kortgen A. Liver failure. Curr Opin Anaesthesiol.2005; 18: 111-6
8. Jafri W, Jafri N, Yakoob J, Islam M, Akhtar S, Hamid S, et al: Hepatitis B and C: prevalence and risk factors associated with seropositivity among children in Karachi, Pakistan. BMC Infectious Diseases 2006; 6: 101
9. Blumberg BS. Sex differences in response to hepatitis B virus. Arthritis Rheum 1979; 22: 1261-6
10. Lok AS, Lai CL, Chung HT, Lau JY, Leung EK, Wong LS. Morbidity and mortality from chronic hepatitis B virus infection in family members of patients with malignant and nonmalignant hepatitis B virus-related chronic liver disease. Hepatology 1991; 13: 834-7
11. William NA, Lee MG, Hanchard B, Barrow KO. Hepatic cirrhosis in Jamaica, West Indian. Med J 1997; 46: 60-2
12. Serrao R, Zirwas M, English JC. Palmar erythema. Am J Clin Dermatol 2007; 8: 347-56
13. Pilette C, Oerti F, Aube C, Rousselet MC, Bedossa P, Gallois Y, et al: Non-invasive diagnosis of esophageal varices in chronic liver diseases. J Hepatol 1999; 31: 867-73
14. Ersoz H, Onde ME, Terekeci H, kurtoglu S, Tor H. Causes of gynaecomastia in young adults males and factors associated with idiopathic gynaecomastia. Int J Androl 2002; 25: 312-6
15. Richter T, Hettmannsperger U. Idiopathic clubbing of the fingers. Pathogenetic mechanisms and differential etiologic diagnosis. Hautarzt 1991; 45: 866-70
16. Kakumu S, Salo K, morisrila T. Prevalence of hepatitis B, hepatitis C and GB virus C/hepatitis G virus infections in liver disease patients and inhabitants in HO Chi Minh Vietnam J Med Virol 1998; 54 (4) 243-9
17. Bojuwoye BJ. The burden of viral hepatitis in Africa. West Afr Jr Med 1997; 16 (4): 198-203.
18. Mahmood A, Mubark A, Rahman Z. prevalence of hepatitis B in Acute and chronic liver disease. Experience at PNS Shifa Karachi. Viral Hepatitis: Proceeding of Seminar 1998.pp.50-1
19. Carrao G, Zambon A, Torchio F. Attributable risk for symptomatic liver cirrhosis in Italy. J Hepatol 1998; 28: 608-14

AUTHORS

- **Dr. Muhammad Zubair**
  MBBS
  Medical Officer
  Department of Pediatric Medicine
  Punjab Medical College / Allied Hospital, Faisalabad.
- **Dr. Zahid Mahmood Anjum**
  MBBS, FCPS
  Senior Registrar
  Department of Pediatric Medicine
  Punjab Medical College / Allied Hospital, Faisalabad.
- **Dr. Sadia Zafar**
  MBBS, FCPS
  Senior Registrar
  Department of Pediatric Medicine
  Punjab Medical College / Allied Hospital, Faisalabad.
- **Dr. Muhammad Shamaoon**
  MBBS, FCPS
  Assistant Professor
  Department of Pediatric Medicine
  Punjab Medical College,Faisalabad.
- **Prof. Dr. Ghulam Raza Balouch**
  MBBS, FCPS
  Head of the Department