

Anti HBs Levels among Children with Chronic Liver Disease from a Super Speciality Hospital

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Abstract

Background: Hepatitis B Virus (HBV) infection remains a major public health problem worldwide. In present context HBV infection is still not an uncommon problem leading to frequent hospitalization. The anti HBs status of children admitted in this hospital is not known amongst whom HBV vaccination could be advocated.

Aim: To evaluate the anti HBs status among children with chronic liver disease attending Gastroenterology Department, Nehru Hospital, PGIMER, Chandigarh.

Methods: 88 children (50 Males,38 Females) of chronic liver disease (CLD) admitted between April 2013 and March 2015 were included in the study (exclusion HBV infected patients).Clinical features of patients, diagnostic investigations including abdominal ultrasonography were recorded. Two ml. of blood was collected from each patient and serum was stored at -20⁰C. Tests for detection of HBsAg, anti HCV and quantitative anti HBs levels were uniformly done on all samples by ELISA.

Results: Overall 35 children with CLD (39.77%,35/88 pts.) had nil level of anti HBs antibody. 12 children (13.63%,12/88 pts.) had anti HBs level of < 10 mIU/ml. 13 children (14.77%, 13/88 pts.) had anti HBs level between 10 - 50 mIU/ml. Another 10 children (11.36%, 10/88 pts.) had anti HBs titer between 50 – 100 mIU/ml. Only 03 children (3.41%, 3/88 pts.) of CLD had anti HBs titer between 100-150 mIU/ml. Rest 15 Children (17.04%,15/88 pts.) had anti HBs titer > 150 mIU/ml. All patients were non reactive for anti HCV.

Conclusions: 46.59% children with chronic liver disease had sero-protective anti -HBs titer. 39.77% children of chronic liver disease undergoing hospital treatment had undetectable anti-HBs antibody and were susceptible to Hepatitis B virus infection. Prophylactic vaccination against HBV infection should be advised in admitted patients after quantitative anti HBs testing.

Keywords: Chronic liver disease, Children, Anti-HBs, HBV

I. Introduction

Hepatitis B Virus (HBV) infection remains a major public health problem worldwide. Immunization against hepatitis B virus (HBV) has proven to be highly effective and led to significant reduction of new infections worldwide. Italy was one of the first industrialized countries to introduce a program of universal vaccination against Hepatitis B virus (HBV) in 1991. Twenty years later, it was found that about 63% of subjects aged < 30 years were anti-HBs positive compared to about 25% in older subjects [1]. In present context even after adopting universal vaccination against Hepatitis B, the HBV infection is still not an uncommon problem leading to frequent hospitalization. The anti HBs status of children admitted in this hospital is not known amongst whom HBV vaccination could be advocated.

II. Objectives

To know the anti HBs status among children with chronic liver disease (CLD) attending Gastroenterology Department, Nehru Hospital, PGIMER, Chandigarh

III. Methodology

The study was carried out prospectively in a tertiary care hospital in North India. Eighty eight children (50 Males and 38 Females) of chronic liver disease admitted between April 2013 to March 2015 were included in the study. A structured proforma comprising clinical features, any past history, history of vaccination against

Hepatitis B virus, results of investigation and outcome was maintained. Baseline tests included full blood count including haematology work up, liver function test, kidney function test and abdominal ultrasound. 2 ml blood was collected and serum stored at - 20°C. All serum samples were uniformly tested for HBsAg (Erba Mannheim), anti HCV (Erba Mannheim) and Quantitative anti HBs levels (DSI s.r.l.) by ELISA. CLD patients reactive for HBsAg were excluded from the study. Results of ELISA tests were interpreted as per manufacturer's instruction.

IV. Results

The mean age of eighty eight children included in the study was 7.8 yrs ± 3.9. These admitted CLD children were mostly of Wilson's disease, Chronic HCV infection, Budd Chiari Syndrome, Congenital Hepatic Fibrosis and Cirrhosis. Among these, 35 children with CLD (39.77%, 35/88 pts.) had nil level of anti HBs antibody with no history of vaccination against Hepatitis B Virus. 12 children (13.63%, 12/88 pts.) had anti HBs level of < 10 mIU/ml. Two among these children had history of incomplete vaccination against HBV. 13 children (14.77%, 13/88 pts.) had anti HBs level between 10 - 50 mIU/ml. Another 10 children (11.36%, 10/88 pts.) had anti HBs titer between 50 – 100 mIU/ml. Only 03 children (3.41%, 3/88 pts.) of CLD had anti HBs titer between 100-150 mIU/ml. Rest 15 Children (17.04%, 15/88 pts.) had anti HBs titer > 150 mIU/ml (Table I.) These children had a history of complete vaccination against HBV. All patients were non reactive for anti HCV. Overall, 46.59% (41/88) children with chronic liver disease had sero-protective anti -HBs titer.

V. Tables

Table I. Anti HBs levels in children with Chronic Liver Disease (n=88)

Patients	Anti HBs reactive (mIU/ml)	HBsAg	Anti HCV
Children (n=35, 39.77%)	Nil	Non Reactive	Non Reactive
Children (n=12, 13.63%)	< 10	Non Reactive	Non Reactive
Children (n=13, 14.77%)	Between 10 - 50 (30.16 ± 11.36 SD)	Non Reactive	Non Reactive
Children (n=10, 11.36%)	Between 50 - 100 (71.66 ± 10.89 SD)	Non Reactive	Non Reactive
Children (n=3, 3.41%)	Between 100 - 150 (123.33 ± 15.27 SD)	Non Reactive	Non Reactive
Children (n=15, 17.04%)	> 150	Non Reactive	Non Reactive

VI. Discussion

Immunization against hepatitis B virus (HBV) has proven to be highly effective and has led to significant reduction of new infections worldwide. After completion of immunization against HBV, the protective anti-HBs titers (≥10 mIU/ml) should be present in the children. However this protective sero-conversion does not occur uniformly. All patients admitted in hospital should undergo quantitative anti HBs ELISA and HBsAg ELISA evaluation in order to administer them HBV vaccine for future safety against HBV infection. Despite vaccination against HBV included in universal vaccination program, there were 39.77% children (35/88 patients) who had undetectable level of anti HBs antibody. In present study 13.63% of CLD children (13/88) had anti HBs level which was not protective in nature with two patients having incomplete vaccination. A study of 107 healthy Egyptian children showed that 43 (40%) did not have a protective anti-HBs level (anti-HBs < 10 IU/L) and 64 (60%) had a protective level (anti-HBs ≥ 10 IU/L) [2]. In present study only 46.59% children (41/88 pts.) had sero-protective anti -HBs titer. However, protective immunity measured by anti-HBs titers may decrease to critical levels in the years after basal immunization, particularly in case of exposure to HBV variants different from the vaccine strain. At the age of one, 92.2% of the children presented with protective anti-HBs titers (≥10 mIU/ml) with the majority having ≥100 mIU/ml. Protective immunity was still high at ages 2 (87.5%) and 4 (95%), declining by age 5 and 6 (from 69.2% to 66.7%) and down to an average of 39.8% between the ages of 7 and 19 [3]. A retrospective study from children admitted in tertiary care hospital from Turkey showed the prevalence of sero-protective anti-HBs in 34.2% of

children despite inclusion of vaccination against HBV in national vaccination programme [4]. A study from Yemen stated that coverage rate of HBV vaccine was only 69.9%. The response of vaccine in children was 54.8% (276/504) with anti-HBs antibody level ≥ 10 mIU/ml, while 228 (45.2%) of the 504 children had non-protective anti-HBs antibodies levels (<10 IU/ml)[5]. But, in countries where vaccination against HBV is done with stringency shows that out of 98% children from Jeddah, kingdom of Saudi Arabia who received complete dosage of vaccination had protective anti HBs sero-positivity for anti HBs in 4 - 6 yrs age group of 78.7% [6]. Hence in present scenario there is urgent need to vaccinate admitted children against HBV after evaluating anti HBs titers in order to protect them from HBV infection.

VII. Conclusion

46.59% children with chronic liver disease had sero-protective anti -HBs titer. 39.77% children with chronic liver undergoing hospital treatment had undetectable anti-HBs antibody. These children were susceptible to Hepatitis B virus infection who urgently needed vaccination against HBV. Prophylactic vaccination against HBV infection should be advised in admitted patients after quantitative anti HBs testing.

References

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