

SEROLOGICAL STUDY OF HEPATITIS B VIRUS IN THE CHILDREN AT THE MIDDLE EUPHRATE AREA

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ABSTRACT

This study was conducted to detect genotypes and the spread of infection with viral hepatitis B type among children of both sexes (from newborns until the age of 16 years) in four provinces of the middle Euphrates provinces (Najaf, Karbala, Babel, and Diwaniya), 422 samples were collected from seven specialized hospitals (one hospital in Najaf and two hospitals from each of the three remaining provinces). There were 76 samples from children with thalassemia and the other 346 samples were random samples from children.

The following technologies, ELIZA (HBsAb, HBsAg) and biochemical measurements of AST and ALT enzyme levels were applied. The percentage of cases of total viral hepatitis B that showed positive results for ELIZA HBsAb test were 8.767 % from total samples, and for ELIZA HBsAg tests, were 0.01 % from total samples.

It was found that 15 out of 43 patients show elevation of ALT enzyme or AST enzyme or both enzymes over the normal value. All thalassemic patients show elevation in both ALT enzyme and AST enzyme.

KEYWORDS: *Hepatitis B, Thalassemia, ELIZA, AST, ALT.*

INTRODUCTION

Hepatitis B virus (an Orthohepadnavirus with features such retroviruses) infection stills a main global health threat within the world because its heterogeneous endemic. [1,2].

Hepatitis B virus is a non-cytopathic, double-stranded hepatotropic DNA virus, belonging for the hepadnaviridae family. The 3.2 kb hepatitis B virus genome encodes four overlapping open reading frames [3].

Hepatitis B virus (HBV) is a prevalent and serious health problem, an evaluated 257 million people live with HBV infection worldwide [4].

Hepatitis B virus establishes chronic infection in about 90% of infants infected at birth, 20– 30% of children infected between the ages of 1 and 5 years and 6% of children infected between 5 and 15 years [5].

Hepatitis B virus infection is correlating with substantial health risks, whereas approximately 5% of population with asymptomatic or acute HBV infection become chronically infected, while individuals infected with this virus are exposed increased risk of developing hepatocyte fibrosis, cirrhosis, and hepatocellular carcinoma [6].

Hepatitis B virus can diffusion when medical syringes and instruments are not completely sterilized, during surgical operations and invasive treatments, and as a result of intravenous drug. The most likely route of spread is body fluids or percutaneous or mucosal exposure to blood from infected patients and carriers. In addition, HBV stay stable on environmental surfaces to more than 7 days [6]. Routes of HBV transmission include sexual transmission, mother to child, and transfusion of blood or blood components [4].

Depending on WHO in A Strategy for Global Action (2012), HBV has infected 2 billion people worldwide also more than 350 million of them are people for chronic HBV infection. Every year, about 780,000 dies from the virus infection from population [7].

MATERIALS AND METHODES

Materials

Patient's samples: A total of 422 children whom admitted to hospitals of middle Euphrates area were included in this study that performed from the beginning of December 2018 to the end of April 2019, blood samples have been taken after filling questionnaire sheet.

Risk Groups (Thalassemic children): Serum samples were collected from 76 of thalassemic children whom admitted to the center of hereditary diseases of the blood in AL-Zahraa Maternity and Pediatrics Hospital in Al-Najaf province and Karbala Hospital for Pediatrics in Karbala province.

Methods

All samples were subjected to investigation for the presence of HBV infection by using of specific ELISA test that searching of both HBsAg and HBcAb.

The positive samples tested by enzymes Alanine Aminotransferase (ALT) and Aspartate Aminotransferase (AST). Figure. 1 represents block diagram of method of study.

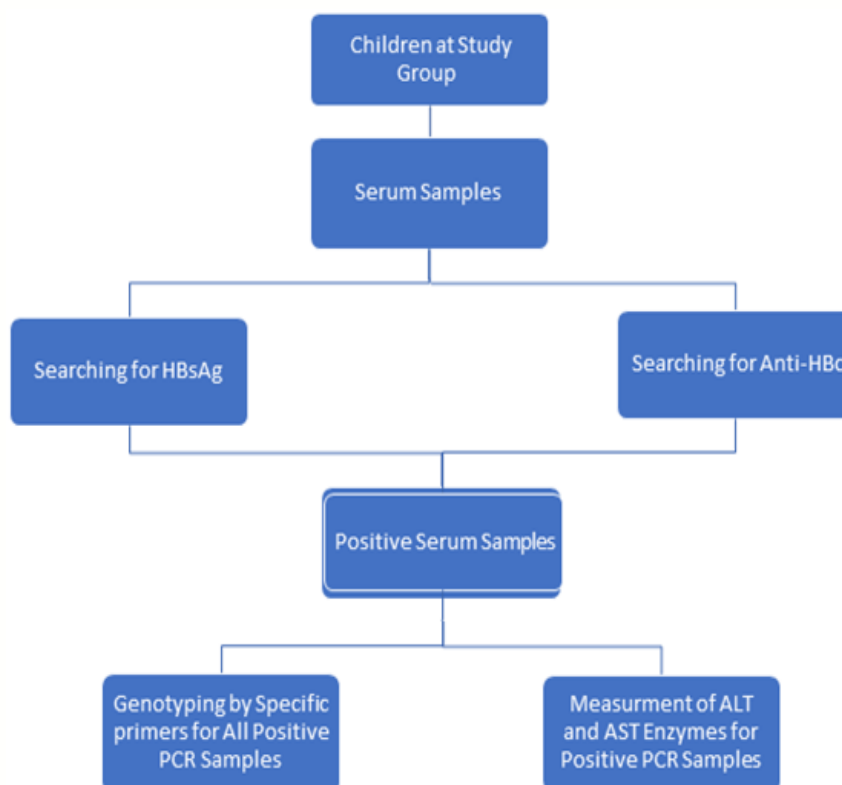


Figure.1 Study design

RESULTS

Results of ELISA Test: The number of children which detected as positive by use of ELISA test were 43 cases out of 422 cases which represent (10. 18%).Table-1 explain the details of total samples, positive samples, and percentages.

Table (1): ELISA Positive Samples in the Study Groups

Study groups	No. of samples	ELISA positive samples	Percentages
General children	346	20	5.78%
Thalassemic Patients	76	23	30.26%
Total	422	43	10.18%

Results of Levels of Transaminases Enzymes: It was found that 15 out of 43 patients show elevation of ALT enzyme or AST enzyme or both enzymes over the normal value. The thalassemic (23) patients show (12) elevation in both ALT enzyme

and AST enzyme. The general children patients (20) show that two patients with high level ALT enzyme and another one patient with high level AST enzyme.

The percentage of patients with ALT enzyme level over the normal value from both the thalassemic patients' and the general children patients was 32.55% while the percentage of patients with AST enzyme level over the normal value from both the thalassemic patients' and the general children patients was 30.23%. Table-2 explains numbers and percentages of ALT and AST levels within study groups.

Table (2): The Positive Children of the Study Groups that were Reflected an Elevation in Transaminases' Levels

Study groups	No. of infected patients	No. of infected patients with elevated ALT level	Percentages	No. of infected patients with elevated AST level	Percentages
General Children	20	2	10%	1	5%
Thalassemic patients	23	12	52.17%	12	52.17%
Total	43	14	32.55%	13	30.23%

The present study included 422 sample of children of four Iraqi provinces, 346 out of them were randomly from the general children population, 76 sample were thalassemic patients' children. using of following tests: ELISA, and measurement of ALT and AST enzymes tests. The current study has found that the infection rate at the general children population was 5.78% (20 positive sample from 346 sample of general children population), while the infection rate at the thalassemic patients' children was 30.26% (23 positive sample from total sample of thalassemic patients' children 76) by using ELISA test (both tests HBsAg and HBcAb). While levels of transaminases enzymes was found that 15 out of 43 patients show elevation of ALT enzyme or AST enzyme or both enzymes over the normal value.

CONCLUSIONS

- 1- Hepatitis B virus infection in the general population children was 4.73%, while the infection rate in the risk group (thalassemic patient children) was 5.45%.

- 2- The thalassemic patients were the highest risk group
- 3- The technique of ELISA was the most suitable, and specific for the diagnosis of HBV infection.
- 4- The study explained the relationship between HBV infection and elevation of levels of ALT and AST enzymes in the liver.

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