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Research Article

**ANALYSIS OF ACUTE HEPATITIS IN CHILDREN AMONG
LOCAL POPULATION OF PAKISTAN**Dr Iqra Maryam¹, Dr Saira Riaz¹, Dr Sidra Batool²¹Allama Iqbal medical college Lahore²BHU, Bhaka Bhattian Hafizabad

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Abstract:

Introduction: Liver is a pivotal organ of the body and play very important role in the metabolism. If there is any problem in the liver then the herbs or different plants play an important role for the treatment of liver disorders.

Objectives of the study: The main objective of the study is to analyse the acute hepatitis in children among local population of Lahore. **Material and methods:** This cross-sectional study was conducted in Jinnah Hospital, Lahore during March 2019 to December 2019. The data was collected from both genders and the sample size is 100. The age range for this study was 6 months to 10 years. Detailed history was taken from all patients with special reference to duration of hepatitis, mode of infection, previous history of jaundice, HBV or HCV infection.

Results: The data was collected from 100 patients. The mean age was 35.16 ± 24.8 months. The data suggest clearly that CD4 count decreases in abnormal liver function. The results shown the table 02 demonstrates the multiple comparison of ALT, AST and ALP level among different treatments and normal group. There were non-significant relationship present in diseased group treated with different therapies like interferon and glutathione as $p < 0.05$. **Conclusion:** It is concluded that HBV infection affected the development of children. Generally, elevated AST levels were effective, in development of children and we aimed to emphasize that this infection should be kept in mind while researching developmental anomalies.

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INTRODUCTION:

Liver is a pivotal organ of the body and play very important role in the metabolism. If there is any problem in the liver then the herbs or different plants play an important role for the treatment of liver disorders¹. There are a number of plants which shows hepatoprotective property. Hepatitis B and C viruses can lead to hepatocellular carcinoma and cirrhosis-related end-stage liver disease, which are potentially life-threatening liver diseases. Hepatitis B and C need immediate worldwide attention as the infection rates are too high. More than 240 million people globally have chronic (long-term) liver infections². Every year, about 600,000 people die because of the acute or chronic consequences of hepatitis B, and more than 350,000 people die from hepatitis C-related liver diseases worldwide².

Hepatitis is a major public health problem and is endemic throughout the world especially in tropical and developing countries. Hepatitis means inflammation of the liver. The liver is indispensable to our survival³. It has synthetic, storage and detoxification functions. An abnormal LFT may signify a serious disease that can be identified only through further testing. These conditions include liver diseases, such as primary biliary cirrhosis (PBC), diseases of other organs such as Paget's disease of bone, and multi-organ diseases such as haemochromatosis. However, the majority of people with an abnormal LFT in primary care settings will not have any such previously undetected disease⁴. They will have either no disease at all, or will be manifesting the effects of alcohol abuse or obesity. The doctor is likely to be aware, or at least suspicious, of these behaviours when ordering LFTs, but this does not exclude the presence of other diseases that may aggravate liver damage. There is thus a real question about which specific further tests, if any, a GP should order when an abnormal LFT result is obtained in a patient with non-specific symptoms, or as a result of routine testing⁵. In some cases there may be a clear indication for further tests. For example, if the patient has a family history of haemochromatosis then their iron saturation should be measured⁶.

HBV and HCV are transmitted mainly through body fluids. HBV is the most common hepatitis causing virus accounting for nearly 2 billion infections globally and around 5–10% of chronic infections among adult populations in sub-Saharan Africa and East Asia⁷. Similarly, an estimated proportion of 2.8% of the world's population representing 180 million individuals are infected with HCV. In Ghana, HBV and HCV respectively account for about 10–15% and 3% of infections in the general population⁸. These two viruses have been implicated in the development of hepatocellular carcinoma (HCC). Whereas about 1–5% of chronic HCV

sufferers are likely to develop HCC, up to 50% of HCC cases are attributed to both direct and indirect oncogenic effects of HBV.

Theoretical background

Children's growth is a multifactorial process involving genetic and environmental factors. Infections, particularly of gastrointestinal origin, may lead to anorexia, reduction in energy and metabolic rate and malnutrition⁶. Malnutrition makes children susceptible to infections through a vicious cycle. Chronic infections and liver diseases may influence the growth and development of children by leading to malnutrition⁷.

Objectives of the study

The main objective of the study is to analyse the acute hepatitis in children among local population of Lahore.

Material and methods

This cross sectional study was conducted in Jinnah Hospital, Lahore during March 2019 to December 2019. The data was collected from both genders and the sample size is 100. The age range for this study was 6 months to 10 years. Detailed history was taken from all patients with special reference to duration of hepatitis, mode of infection, previous history of jaundice, HBV or HCV infection. A thorough clinical examination was carried out and stigmata of chronic liver disease, hepatosplenomegaly, ascites, etc. if present were noted.

Biochemical analysis

Blood investigation including Hemoglobin (Hb), total leucocytes count (TLC), differential leucocytes count (DLC), platelet count, X-ray chest, ultrasound abdomen and LFT were done in all patients. The LFT included serum bilirubin, aspartate aminotransferase (AST), alanine aminotransferase (ALT), serum alkaline phosphatase (SAP) and serum albumin. Abnormal values were defined as serum Bilirubin ≥ 1.5 mg/dl, ALT/AST ≥ 50 IU/ml.

Molecular analysis

Molecular test for HAV/HBV was performed using a One Step Reverse Transcription (RT)-PCR reagent kit. Briefly, a 25 μ l reaction mix contained 1 μ l of 10 mM dNTPs, 1 μ l of 10 μ M each of forward and reverse primers, 5 μ l of Q solution, 6 μ l of RNase free water, 1 μ l of enzyme mix and 5 μ l of nucleic acid extract. Cycling conditions comprised RT at 48°C for 30 minutes, denaturation of 94°C for 2 minutes and 40 cycles of 95°C for 15 seconds, 50°C for 30 seconds and 68°C for 60 seconds. PCR products were visualized on a 2% agarose gel with 2 μ l of Ethidium bromide per 100 ml gel solution, and bands of 510 bp were noted as positive for HAV. For all the tests, known control samples positive for HAV were used to validate the run.

Table 1: Sequence of primers in real time PCR

Name	Sequences
HAV (forward)	5'-ATCCTTGCTATCTGGGTGCTA-3'
HAV (reverse)	5'-TGAGAGACCAATACATGAGGACA-3'
HBV (forward)	5'-AGATGTCAAACGTGCGAGTG-3'
HBV (reverse)	5'-CCATGTCTCTGCAGTGCTTC-3'

Statistical analysis

Each experiment was repeated three times and all data were displayed in mean±SD and analysed through SPSS 19.0 (IBM, USA). T-test and one-way ANOVA were applied for measuring comparison among groups. P<0.05 was considered to have statistical meaning.

RESULTS:

The data was collected from 100 patients. The mean age was 35.16 ± 24.8 months. The data suggest clearly that CD4 count decreases in abnormal liver function. The results shown the table 02 demonstrates the multiple comparison of ALT, AST and ALP level among different treatments and normal group. There were non-significant relationship present in diseased group treated with different therapies like interferon and glutathione as as p<0.05.

Table 01: Associations of Clinical Parameters with Abnormal Liver Function Tests

Variable	Summary
Total	100
Hepatomegaly	
No	65 (61.3)
Yes	35 (38.7)
Splenomegaly	
No	89 (89.7)
Yes	10 (10.3)
Diagnosis	
Acute liver disease	10 (7.2)
chronic liver disease	59 (42.8)
hepatic encephalopathy	9 (6.5)
Hepatocellular carcinoma	2 (3.2)
Liver cirrhosis	6 (11.6)
Others	12 (8.7)
Upper Gastrointestinal Bleeding	
No	84 (86.5)
Yes	16 (13.5)
Respiratory rate	
mean(SD)	28.1 (12.1)
Heart rate	
mean(SD)	100.4 (22.8)
Clinical outcome	
Died	5 (3.2)
Discharged	95 (96.8)

Table 02: LFTs of hepatitis patients

S.O.V	Sum of Squares	df	Mean Squares	F	Sig.
ALP	15292.855	4	3823.214	18.288	.000
AST	4181.198	20	209.060	23.794	
ALT	19474.054	24		35.391	.000

Table 03: Biochemical analysis of patients in HBV

	Mean ± SD
AST (U/L)	12 - 66 (35.2 ± 11.1)
ALT (U/L)	9 - 113 (37.6 ± 21)
GGT (U/L)	6 - 29 (11.7 ± 3.8)
ALP (U/L)	71 - 491 (259.27 ± 81.06)
Total bilirubin (mg/dL)	0.2 - 1.3 (0.22 ± 0.1)
Direct bilirubin (mg/dL)	0.1 - 0.5 (0.22 ± 0.1)
AFP (IU/mL)	0 - 5.4 (1.5 ± 1.14)
IGF-1 SDS (ng/mL)	-2.27 - 6.81 (0.5 ± 1.94)
IGFBP-3 SDS (ng/mL)	-3.83 - 2.59 (0.16 ± 1.40)

DISCUSSION:

This study demonstrated that host and environmental factors affect the severity of liver disease in patients with acute hepatitis A. Acute hepatitis A is mostly self-limited, thus in the past, fulminant hepatitis due to hepatitis A was considered rare. However, fulminant hepatitis from HAV is increasing constantly because of low anti-HAV positivity resulting in increased number of the patients in adolescents and young adults⁹. On the other hand, prevalence of fulminant hepatitis from hepatitis B is decreasing; therefore fulminant hepatitis from hepatitis A is increasing relatively. Damage to the structural integrity of liver is reflected by an increase in the level of serum transaminase because these are cytoplasmic in location and are released into circulation after cellular damage¹⁰. It is generally accepted that the toxicity of carbon tetrachloride depends on the cleavage of the carbon-chlorine bond to generate a trichloromethyl free radical, and this free radical reacts rapidly with oxygen to form a trichloro methyl peroxy radical, which may contribute to the hepatotoxicity and subsequent increase in hepatic enzymes¹¹.

Over 4 million acute hepatitis B cases are diagnosed every year which leads to one fourth of cases becoming chronic carriers. The chronic stage accounts for 1 million deaths per year due to chronic active hepatitis, cirrhosis and hepatocellular carcinoma¹²⁻¹³.

CONCLUSION:

It is concluded that HBV infection affected the development of children. Generally, elevated AST levels were effective, in development of children and we aimed to emphasize that this infection should be kept in mind while researching developmental anomalies. Monitoring of growth and development during follow-up of children who are detected to have HBsAg positivity would be beneficial to determine the mechanism and causes of growth retardation.

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