|| ISSN(online): 2589-8698 || ISSN(print): 2589-868X ||
International Journal of Medical and Biomedical Studies
Available Online at www.ijmbs.info
PubMed (National Library of Medicine ID: 101738825)
Index Copernicus Value 2018: 75.71
Original Research Article Volume 4, Issue 2; February: 2020; Page No. 65-67

A STUDY OF HEPATIC DYSFUNCTION IN DENGUE EPIDEMIC

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Article Info: Received 15 January 2020; Accepted 06 February 2020
DOI: https://doi.org/10.32553/ijmbs.v4i2.929
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Conflict of interest: No conflict of interest.

Abstract
Background: To study liver function test in dengue fever patients.
Methods: This study was hospital based prospective study, which included 100 cases of dengue fever.
Results: 28 patients had ALT >1-3 ×UNL (upper normal limit), 18 patients had ALT >3-10×UNL and 6 patients had >10×UNL. 24 patients had AST >1-3×UNL, 23 patients had AST >3-10×UNL and 11 patients had >10×UNL.
Conclusion: The aspartate aminotransferase (AST) levels in dengue patients was higher than alanine aminotransferase(ALT) levels. This differs from the pattern in viral hepatitis but is similar to that seen in alcoholic hepatitis.

Introduction

Dengue infection is a major health problem in our country. Globally the incidence of dengue has increased in the recent years. The WHO estimates that presently about two fifths of the world population is at risk for this viral infection. Dengue was first reported in 1780, when Benjamin Rush described this condition as “break bone fever”. It is a mosquito borne viral infection with four serotypes causing dengue fever (DF), dengue hemorrhagic fever (DHF), and dengue shock syndrome (DSS)[1-2]. It is estimated that worldwide nearly 2.5 billion people continue to live at risk of contracting the infection while 50 million cases and 24,000 deaths tend to occur in 100 endemic countries. Risk of mortality in treated cases of DHF/DSS is 1% while mortality rate among untreated cases escalates to 20% [3]

Liver injury is nearly universal in patient with dengue fever. Dengue virus antigen is found in kupffer cells and sinusoidal lining cells in the liver. Detection of dengue antigen in hepatocyte suggests that such cells can support viral replication . Histopathological finding include centrilobular necrosis, fatty alterations , hyperplasia of kupffer cells , acidophil bodies and monocytes alteration of the portal tracts.In most cases hepatic involvement prolongs the clinical course of this self limiting viral infection and constitutes a sign of worst prognosis . Hepatic involvement can be a majar contributing factor in morbidity and mortality of such patients with dengue fever. So AST and ALT can be a useful early marker to assess the severity of the disease which can thereby lead to early recognition of high risk cases[4].

Material and Methods:

This study was hospital based prospective study, which included 100 cases of dengue fever.

INCLUSION CRITERIA

1) Patients more than 14 years of age. Patients with classical features of dengue fever - like fever with chills, body ache, headache, rash, bleeding manifestation and TCP.

2) Patients with either of these tests are positive-

1) NS1 antigen by serological test
2) IgM by MAC ELISA

EXCLUSION CRITERIA

1) Dengue with any chronic disease like CLD, CKD, CAD.
2) Patient with history of intake of any hepatotoxic or similar drugs causing derangements of liver functions.
3) Dengue patients having other known infections causing hepatitis such as acute or chronic viral hepatitis , leptospirosis, malaria, enteric fever.

LIVER FUNCTION TEST

Serum aminotransferase are the sensitive markers of acute hepatocellular injury. ALT is a cytosolic enzyme while AST is both cytosolic and mitochondrial. elevations of AST and ALT are seen in dengue. Serologically confirmed cases are divided in 4 group according to serum AST and ALT levels.

GRADE A-patients with normal aminotransferase level.

GRADE B- at least one of the enzymes raised to less than 3 times.

GRADE C- at least one of the enzymes elevated more than 3 times but less than 10 times.

GRADE D- If at least one of the enzyme elevation more than 10 times.

Results:

Table 1: Age distribution showing total cases.

Age groups (in years)	No of cases	Percentage
14-25	37	37.00
26-40	42	42.00
41-50	13	13.00
>50	8	8.00
Total	100	100

In our study out of 100 patients majority of the cases having dengue infection belong to the age group of 26-40 followed by 14-25 years. so it was more common in young adults.

Table 2: GENDER WISE DISTRIBUTION-

Sex	No of cases	Percentage
Male	49	48
female	51	52
total	100	100

The present study included 49 males and 51 females .

All patients presented with fever and other symptoms observed were arthralgia(72%), backache(84%), retro-orbital pain (73%),and abdominal pain (54%), rash(61%), vomiting(62%), diarrhea(67%). Icterus present in 10% patients, pleural effusion in 24% cases , ascites in 14% cases, hepatomegaly in 35% cases and splenomegaly in 28% cases.

Table 3: ALT elevation in patient with dengue infection

ALT Value	Number of cases	percentage
≤1×	48	48.00
>1-3×	28	28.00
>3-10×	18	18.00
>10×	6	6.00
total	100	100

28 patients had ALT >1-3 ×UNL (upper normal limit), 18 patients had ALT >3-10×UNL and 6 patients had >10×UNL.

Table 4: AST elevation in patient with dengue infection

AST value	Number of cases	percentage
≤1×	42	42.00
>1-3×	24	24.00
>3-10×	23	23.00
>10×	11	11.00
total	100	100

24 patients had AST >1-3×UNL, 23 patients had AST >3-10×UNL and 11 patients had >10×UNL.

Discussion:

Dengue fever is the one of the most important arboviral infections. It has become a major global public health problem. In India, epidemics are becoming more frequent.

In our study out of 100 patients majority of the cases having dengue infection belong to the age group of 26-40 followed by 14-25 years. so it was more common in young adults. The present study included 49 males and 51 females.

A study conducted by Sarkar et al[4] showed 84% of the cases in age group of 11-30 years. Another study conducted by Fu Xi Qiu et al[5] found 81% of the cases were among more than 20 years.

A study conducted by Rajoo singh china et al[6] showed 81.3% cases of dengue fever, 13.6% cases of dengue haemorrhagic fever and 5.1% cases of dengue shock syndrome. 41.1% had ALT >1-3×UNL, 48.5% patients had ALT >3-10×UNL and 8.4% patients had ALT >10×UNL. 19.2% patients had AST >1-3×UNL, 55.1% patients had AST >3-10×UNL and 23.4% patients had AST >10×UNL. All cases of DSS had elevated ALT level, 93.10% cases of DHF had elevated ALT level and 92.5% cases of DF had evevated ALT level. All cases of DSS had elevated AST, 100% cases of DHF had elevated AST level and 97.10% cases of DF had evevated AST level. 50% cases of DSS had elevated ALP, 40% cases of DHF had elevated ALP and 30.3% cases of DF had elevated ALP levels. 19.5% cases had elevated bilirubin and 29.1% cases had elevated albumin.

A study conducted by Luiz Jose de Souza et al[7] showed 32.1% had ALT >1-3×UNL, 11.1% patients had ALT >3-10×UNL and 1.8% patients had ALT >10×UNL. 43.9% patients had AST >1-3×UNL, 16.1% patients had AST >3-10×UNL and 3.4% patients had AST >10×UNL. . This correlated with the above mentioned study.

The aspartate aminotransferase(AST) levels in dengue patients was higher than alanine aminotransferase(ALT) levels. This differ from the pattern in viral hepatitis but is similar to that seen in alcoholic hepatitis. This abnormality may act as an early indicator of dengue infection.

AST and ALT levels higher in DHF and DSS as compared to the DF, suggesting that the degree of liver injury may be related to the severity of dengue infection. Similar data have been suggested by Rajoo singh china et al.[6]

Conclusion

The aspartate aminotransferase(AST) levels in dengue patients was higher than alanine aminotransferase(ALT) levels. This differs from the pattern in viral hepatitis but is similar to that seen in alcoholic hepatitis.

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