A Study of Hepatic Dysfunction In Dengue Epidemic In Bikaner

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Abstract

Background: Hepatic involvement can be a major contributing factor in morbidity and mortality of dengue fever. So by LFT we can early diagnosed the high risk cases.

Methods: The study was carried out in the, Sardar Patel, Medical College and Associated group of hospital, Bikaner. This study was hospital based prospective study, which included 150 cases of dengue fever.

Results: 43(28.66%) patients had ALT >1-3 ×UNL(upper normal limit), 27(18%) patients had ALT >3-10×UNL and 8(5.33%) patients had >10×UNL. 36(24%) patients had AST >1-3×UNL, 35(23.33%) patients had AST >3-10×UNL and 16(10.66%) patients had >10×UNL. All cases of DSS had elevated AST , 71.11% cases of DHF had elevated AST level and 51.45% cases of DF had evevated AST level. All cases of DSS had elevated ALT level, 66.66% cases of DHF had elevated ALT level and 44.66% cases of DF had evevated ALT level.In our study 26% cases of had elevated ALP level . In present study among 150 patients 19.33% patients had elevated bilirubin level and 15.33% patients had elevated albumin level.

Conclusion: 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.ALT and AST levels higher in the DHF and DSS as compared to the DF, suggesting that the degree of liver injury may be related to the severity of dengue infection.

Keywords: AST, ALT, DHF, DSS.

Introduction

Dengue is a mosquito borne disease caused by four different virus type, DEN 1-4 and spread by the Aedes aegypti mosquito. Worldwide an estimated 2.5 billion people are at risk of infection. it is estimated that more than 50 million infections occure each year, of which 500,000 hospitalisations are of dengue haemorrhagic fever, with the case fatality rate exceeding 5% in some areas[1]. Dengue virus is a member of the flaviviridae family and the goenus flavivirus . Dengue presenting with a wide range of severity 'severe' dengue as

categorized by world health organization (WHO) in 2009 include the dengue hemorrhagic fever and dengue shock syndrome[2].

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[3].

Objective: Hepatic involvement can be a major contributing factor in morbidity and mortality of dengue fever. So by LFT we can early diagnosed the high risk cases.

To study the age and sex distribution of dengue infection.

Material And Methods

The study was carried out in the , Sardar Patel, Medical College and Associated group of hospital, Bikaner. This study was hospital based prospective study, which included 150 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.

The patients who satisfy the inclusion criteria were evaluated for the following parameters-

1) Liver function test
2) Hematological parameters

USG for abdomen , pelvis and USG for pericardial effusion, pleural effusion.

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

The present study included 72 males and 78 females .so in our study male to female ratio was 1:1.08.

Table 1: Age distribution showing total cases.

Age groups (in years)	Number	%
14-25	62	41.33
26-40	60	40.00
41-50	20	13.33
>50	8	5.30
Grand total	150	100

In our study out of 150 patients majority of the cases having dengue infection belong to the age group of 14-25 followed by 26-40 years . So it was more common in young adults.

Table 2: Gender Wise Distribution

Sex	Number	%
Male	72	48
female	78	52
total	150	100

Table 3: Distribution of study population according to dengue classification-

Diagnosis	Number	%
DF	103	68.66
DHF	45	30.0
DSS	2	1.33
Total	150	100.00%

Out of 150 cases 103were classic dengue fever, 45cases were dengue haemorrhagic fever and 2 cases were dengue shock syndrome.

All patients presented with fever and other symptoms observed were arthralgia(72%), backache(84%), retro-orbital pain (73.33%),and abdominal pain (54%), rash(66.66%), vomiting(62.66%), diarrhea(67.33%).

Table 4: Distribution of cases according to their signs-

Signs	Number of cases	percentage
Icterus	16	10.81
Pleural effusion	36	24.32
Ascites	20	13.51
Hepatomegaly	52	34.66
Splenomegaly	42	28.00

icterus present in 10.81% patients, pleural effusion in 24.32% cases , ascites in 13.51% cases, hepatomegaly in 34.66% cases and splenomegaly in 28% cases.

Table 5: ALT elevation in patient with dengue infection

ALT Value	Number of cases	percentage
≤1×	72	48.00
>1-3×	43	28.66
>3-10×	27	18.00
>10×	8	5.33
total	150	100

43(28.66%) patients had ALT >1-3 ×UNL(upper normal limit), 27(18%) patients had ALT >3-10×UNL and 8(5.33%) patients had >10×UNL.

Table 6: AST elevation in patient with dengue infection

AST value	Number of cases	percentage
≤1×	63	42.00
>1-3×	36	24.00
>3-10×	35	23.33
>10×	16	10.66
total	150	100

36(24%) patients had AST >1-3×UNL, 35(23.33%) patients had AST >3-10×UNL and 16(10.66%) patients had >10×UNL.

Table 7: Comparison of the pattern of rise of ALT in patients with DF,DHF,DSS-

ALT value	DF	DHF	DSS

	No	%	No	%	No	%
>1-3×	31	30.09	12	26.66	0	00
>3-10×	11	10.67	15	33.33	1	50
>10×	4	3.88	3	6.66	1	50
total	46	44.66	30	66.66	2	100

All cases of DSS had elevated ALT level, 66.66% cases of DHF had elevated ALT level and 44.66% cases of DF had evevated ALT level.

Table 8: Comparison of the pattern of rise of AST in patients with DF,DHF, DSS-

AST	DF		DHF		DSS	
	NO	%	NO	%	NO	%
>1-3×	28	27.18	8	17.77	0	0
>3-0×	20	19.41	14	31.11	1	50
>10×	5	4.85	10	22.22	1	50
total	53	51.45	32	71.11	2	100

All cases of DSS had elevated AST , 71.11% cases of DHF had elevated AST level and 51.45% cases of DF had evevated AST level. In our study 26% cases of had elevated ALP level . In present study among 150 patients 19.33% patients had elevated bilirubin level and 15.33% patients had elevated albumin level.

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 150 patients , 62(41.33%)were between the age of 14-25yrs, 60(40.0%) were between the age of 26-40yrs, 20(13.33%) were between the age of 41-50yrs and 8(5.3%) were above 60yrs.Male to female ratio was 1:1.08. Most of the cases belonged to classical dengue fever and dengue hemorrhagic fever.

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

In our study majority of the patients were in adult age group and show female preponderance.Most of the cases belonged to classical dengue fever and dengue hemorrhagic fever. 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. This abnormality may act as an early indicator of dengue infection.ALT and AST levels higher in the DHF and DSS as compared to the DF, suggesting that the degree of liver injury may be related to the severity of dengue infection. So hepatic dysfunction is correlates with severity of dengue infection.

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