Liver function tests in patients presenting with Dengue fever

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Abstract

Background & Objectives: *Dengue is probably the most important arthropod-borne viral disease worldwide. Dengue is caused by flavi virus types 1- 4. Liver involvement is one of the common features in dengue fever. Various studies have shown that in all those patients who develop complications like dengue hemorrhagic fever, dengue shock syndrome the levels of SGOT and SGPT were significantly raised. The severity of liver involvement can be a major predictor of morbidity and mortality of such patients with Dengue fever. So LFT can be a used to assess the severity of the disease which can thereby lead to early recognition of high risk cases.*

Materials & Methods: *This study was conducted in Kanyakumari Government Medical College in the department of general medicine. 100 patients were included in the study over a period from August 2017 – July 2018 for a period of 1 year. Detailed history, a complete general physical and systemic examination, with relevant investigations were done on hundred patients.*

Results: *Of 100 patients, 35% had less than 2-fold increase in SGOT levels, 31% had 2-10-fold increase and 12% had more than 10-fold increase. Overall 22% had normal values and 78% had values of SGOT above normal. With regard to SGPT 24% had normal values, 32% had less than 2-fold of normal, 26% had 2-10-fold increase and 18% had more than 10 fold increase from normal. Vomiting and pain abdomen in the early stage suggested hepatic involvement. AST and ALT were statistically higher in these patients and in those developing complications like DHF, DSS, hepatic failure, ARDS, AKI and encephalopathy.*

Conclusion: *Liver involvement is common in adult patients with dengue. Hepatic involvement prolongs the clinical course of this self limiting disease and can be a major predictor of 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 thus lead to early recognition of high risk cases.*

Keywords: *Dengue fever; AST; ALT; Hepatic dysfunction.*

Introduction

Dengue fever is an important arthropod-borne viral infection of humans. Worldwide, an estimated 2.5 billion people are at risk of infection. Dengue viral infection was first reported in India from Chennai in 1780. India has recorded increasing incidence of dengue viral infections in recent years. In 2017, India has seen 11832 more cases of dengue when compared with 2016 and the number of deaths were 46, eleven deaths more than the previous year.

Liver injury is nearly universal in adult patients with dengue fever. Dengue virus antigen is found in Kupffer cells and sinusoidal lining cells in the liver. Detection of dengue antigen virus in hepatocyte suggests that such cells can support viral replication. Histopathological findings include centrilobular necrosis, fatty alterations, hyperplasia of the Kupffer cells, acidophil bodies and monocyte 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. Such liver involvement can be a major 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.

As dengue fever is now endemic in southern parts of India especially tamilnadu, and recent outbreaks have occurred in Tirunelveli in 2013& in Salem in 2017, it is need of the hour to explore the different aspects of the disease.

Materials & Methods
Aims and Objectives
To study the liver function tests in patient presenting with dengue fever & and to assess the clinical severity based on the tests.

Design of the study
Hospital based observational cross sectional study.

This study was conducted in the Kanyakumari Government Medical College in the Department of General Medicine.100 patients were included in this study over a period from August 2017 to July 2018 for a period of 1 year.

Inclusion Criteria
All patients of age more than 20 years, coming with symptoms of dengue fever and had positive serology

(Dengue NS 1positive cases / IgM Ab positive cases)

Exclusion Criteria
All patients with fever who were Dengue IgM/NS1 Ag negative.

Age below 20 years

Patients with other infections which cause thrombocytopenia like malaria, enteric fever and patients suffering from pre existing liver diseases, chronic drug intake

The institutional ethical clearance for this study was obtained from the ethical committee. After obtaining a detailed history, general physical examination and systemic examination, the patients were subjected to relevant investigations. Dengue Serology, Complete Blood Count, Liver Function Tests, Renal Function Tests, Ultrasound Abdomen were done on all patients. Dengue serology for NS1Ag, IgM was done using ELISA method.

Results
100 patients diagnosed as a case of dengue fever were enrolled. Of the total 100 patients, 58 were male and 42 were female. Most of the patients were in the age group of 31-40 years.
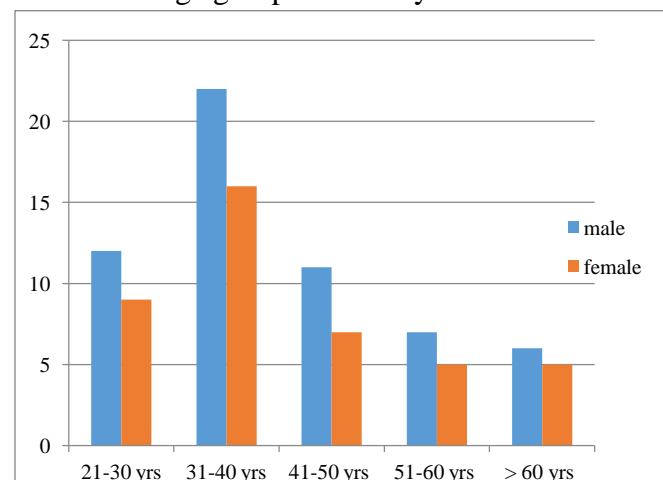
Symptoms at the time of Presentation

Clinical features	Number of patients
Fever	68
Headache	20
Myalgia	40
Retro orbital pain	34
Abdominal pain	42
Rash	12
Arthralgia	26
Bleeding	16
Vomiting	38
Diarrhea	13

Signs at the time of Presentation

Signs	Gender		Total (n=100)
	Female (n=42)	Male (n=58)	
Icterus	3(7.1%)	8(13.7%)	11(11%)
Pleural effusion	4(9.5%)	9(15.5%)	13(13%)
Ascites	2(4.7%)	10(17.2%)	12(12%)
Hepatomegaly	14(33.3%)	23(39.6%)	37(37%)
Splenomegaly	3(7.1%)	7(12.06%)	10(10%)

Showing Percentage of patients having elevated AST levels

AST	No. of patients(n=100)	%
Normal	22	22%
Mild elevation	35	35%
Moderate elevation	31	31%
Severe elevation	12	12
Total	100	100.0

Showing patients having elevated ALT levels

ALT	No. Of patients(n=100)	%
Normal	24	24%
Mild Elevation	32	32%
Moderate elevation	26	26%
Severe elevation	18	18%
Total	100	100.0

Mild elevation < 2 fold, moderate 2-10 fold, severe more than 10 fold increase from normal.

Complications
Showing complications in patients with elevated AST level

Complications	No. of patients	%
Dengue Hemorrhagic Fever	16	20.5%
Dengue Shock Syndrome	5	6.4%
Septicemia	1	1.2%
Hepatic failure	1	1.2%
Encephalopathy	1	1.2%
Renal failure	2	2.5%
Acute Respiratory Distress Syndrome	3	3.8%

Complications	AST			Total (n=100)
	Mild Elevation (n=35)	Moderate Elevation (n=31)	Severe Elevation (n=12)	
Dengue Hemorrhagic Fever	3(8.5%)	5(16.1%)	8(66.6%)	16(16%)
Dengue shock syndrome	0(0%)	2(6.4%)	3(25%)	5
Septicemia	0(0%)	0(0%)	1(8.3%)	1
Hepatic failure	0(0%)	0(0%)	1(8.3%)	1
Encephalopathy	0(0%)	0(0%)	1(8.3%)	1
Renal failure	0(0%)	0(0%)	2(16.6%)	2
ARDS	0(0%)	1(3.2%)	2(16.6%)	3

Showing complications with elevated ALT levels

Complications	No. of patients	%
Dengue Hemorrhagic Fever	13	17.1%
Dengue Shock Syndrome	3	3.9%
Septicemia	1	1.3%
Hepatic failure	1	2.6%
Encephalopathy	1	1.3%
Renal failure	3	3.9%
Acute Respiratory Distress Syndrome	1	1.3%

Complications	ALT			Total(n=100)
	Mild Elevation (n=32)	Moderate Elevation (n=26)	Severe Elevation (n=18)	
Dengue Hemorrhagic Fever	2(6.2%)	4(15.3%)	7(38.8%)	13(13%)
Dengue Shock Syndrome	0(0.0%)	1(3.8%)	2(11.1%)	3(3%)
Septicemia	0(0.0%)	0(0.0%)	1(5.5%)	1(1%)
Hepatic failure	0(0.0%)	0(0.0%)	1(5.5%)	2(2%)
Encephalopathy	0(0.0%)	0(0.0%)	1(5.5%)	1(1%)
Renal failure	0(0.0%)	1(3.8%)	2(11.1%)	3(3%)
ARDS	0(0.0%)	0(0.0%)	1(5.5%)	1(1%)

Analysis of complications

16% of patients had DHF. The most common manifestation being upper gastrointestinal Bleed. This study has also shown a higher elevation of AST and ALT in DHF patients. In this study, five patients had developed Dengue shock syndrome, out of which three had severe and two had moderate levels of elevation of AST levels. With

regard to ALT two had severe and one patient had moderate levels of elevation of ALT levels.

Conclusion

This study showed that Dengue fever is more common in the fourth decade and that AST and ALT levels were raised in the majority of these patients. It was also found that AST levels were more than ALT levels, which was uniformly observed in all those patients who developed complications like DHF, DSS, Hepatic failure, ARDS, Renal failure and Septicaemia, proving he fact that severity of hepatic involvement can be a major 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 thus lead to early recognition of high risk cases.

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