Original Research Article

A study of dengue and hepatopathy

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ABSTRACT

Background: Dengue is a major international health concern that is prevalent in tropical and sub-tropical countries. It is 2nd most common arthropod borne disease in India. There are certain clinical features that are associated with Dengue in addition of the classical features. Previously organ impairment has been only considered under set up of severe disease. On the recent years, several studies have suggested the possibility of early involvement of the liver in dengue. Further due to its atypical presentation often dengue missed out as a differential diagnosis.
Methods: A total of 50 patients were selected to be a part of study after applying inclusion and exclusion criteria. Only those patients were included in the study who had classical features of dengue- fever with chills, body ache, headache, rash, bleeding manifestations and thrombocytopenia and had a positive ELISA test i.e. IgM antibodies against dengue virus. Patients who had malaria and enteric fever were excluded from the study. All patients were subjected to a detailed history and a thorough clinical examination. A complete blood count, liver function tests, renal function tests, chest X-ray and USG abdomen were also done.
Results: An analysis of 50 patients suffering from dengue showed liver dysfunction was present in all patients. Vomiting was an important symptom present upto 70% of patients. SGOT levels were higher than SGPT levels. Hepatosplenomegaly and ascitis were also present in significant number of patients. An analysis of these patients revealed that patients typically demonstrate high grade fever, body ache, rash, thrombocytopenia and bleeding tendency, there were other features such as liver dysfunction including a preferential rise of SGOT, hepatosplenomegaly, ascitis, pleural effusion and leucopoenia.
Conclusions: This study showed that dengue fever was seen in the third 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. 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. The presence of raised liver enzymes in all patients, ascitis, hepatosplenomegaly, elevation of SGOT more than SGPT, should be kept in mind when evaluating patients with suspected dengue.

Keywords: Dengue, Hepatopathy, North-west India

INTRODUCTION

Dengue infection is a major health problem worldwide especially in tropical countries like India. The WHO estimates that presently about "half" of the world population is at risk for this viral infection. Global incidence of dengue has drastically upped in the last few years. According to the World Health Organization (WHO), there are about 390 million cases of dengue fever worldwide, and of the total number of cases, 96 million require medical treatment. India also saw a doubling up of cases of dengue from 2014 to 2015 and the worst hit city was Delhi with over 1800 cases of the fever. 2016 isn't expected to be any better and this has

become a cause of concern for the country.[1] Every year during the monsoon months and later, many parts of the country witness outbreaks of dengue infection.

METHODS

This study was conducted as a hospital based observational study at a tertiary care centre in north-west India. A total of 50 patients were selected to be a part of study after applying inclusion and exclusion criteria. These were patients who were admitted to Medicine wards at SP Medical College from August to December 2016. Only those patients were included in the study who had classical features of dengue- fever with chills, body ache, headache, rash, bleeding manifestations and thrombocytopenia and had a positive ELISA test i.e. IgM antibodies against dengue virus. Patients who had malaria and enteric fever were excluded from the study. All patients were subjected to a detailed history and a thorough clinical examination. A complete blood count, liver function tests, renal function tests, chest X-ray and USG abdomen were also done.

RESULTS

In present study, Of the 50 patients studied, 40 were males and 10 females.

Table 1: Age wise distribution.

Age in years	No. of patients	%
18-20	4	8
21-30	22	44%
31-40	17	34%
41-50	7	14%
Total	50	100%

The age range of patients was 15-59 years and the mean age was 28 years. It was noted that the incidence of dengue fever varied from minimum age of 21 years to a maximum age of 40 years (78%) with majority noted in the 3rd decade (44%).

Table 2: Gender distribution.

Gender	No. of patients	%
Female	10	20
Male	40	80%
Total	50	100%

Table 3: Signs at the time of presentation.

Signs	Female	Male	Total
Icterus	2 (4%)	3 (6%)	5 (10%)
Pleural effusion	2 (4%)	2 (4%)	4 (8%)
Ascites	8 (16%)	12 (24%)	20 (52%)
Hepatomegaly	12 (24%)	16 (32%)	28 (56%)
Splenomegaly	3 (6%)	4 (8%)	7 (14%)

All patients had fever as presenting complaint.80% patients had body ache while 70% had vomiting. 20% patients had bleeding tendency with upper GI bleed being the commonest presentation.

Table 4: Showing patients having elevated ALT levels.

ALT	No. of patients	%
Normal	35	70%
Mild elevation	5	10%
Moderate elevation	4	8%
Severe elevation	6	12%
Total	50	100%

The average platelet count of our patients was 30,000±20,000. The average serum bilirubin level was 1±0.5 mg/dL. The average SGPT levels were 202±150 units/L while average SGOT levels were 135±100 units/L. 32% patients had an elevated SGOT level while 30% patients had elevated SGPT level. There were 22% patients who had their SGOT level>2 x UNL, while 16% patients had SGPT levels>2 x UNL. In patients who had raised levels of both enzymes, the SGOT levels were 2-3 times higher than SGPT levels (Table 6). None of the patients included in our study showed acute liver failure.

Table 5: Showing patients having elevated AST levels.

	No. of patients	%
Normal	32	64%
Mild elevation	8	16%
Moderate elevation	4	8%
Severe elevation	6	12%

Table 6: Clinical characteristics and lab parameters in the study subjects.

Parameter	Value
Avg. platelet count	30,000±20000 (per mm^3)
Avg. bilirubin level	1±0.5 (mg%)
Avg. SGPT level	202±150 (units/L)
Avg. SGOT level	135±100 (units/L)
Avg. alkaline phosphatase level	84±60 (units/L)
SGPT>2xULN	11 (22%)
SGOT>2xULN	8 (16%)
Ascitis	20 (52%)
Hepatomegaly	28 (56%)
Splenomegaly	7 (14%)
Pleural effusion	4 (8%)
Leukopenia	15 (30%)

Values showing mean±std deviation or n (%)

56% patients had hepatomegaly or hepatosplenomegaly. 28 patients had hepatomegaly on ultrasonography and 10 of them had liver enlargement clinically as well. 7 patients had splenomegaly on USG of which only 3 had

spleen enlargement clinically. 26 patients had evidence of ascitis on ultrasonography. Only 4 patients out of these had clinically detectable ascitis. Ascitis in all patients was minimal to mild. 8% patients had evidence of pleural effusion on USG/X-ray. 30% patients had evidence of leucopenia. Further details of results are enumerated in respective tables.

DISCUSSION

In the study done by Vaibhav Shukla, Ashok Chandra at Era's Lucknow Medical College it was shown that the average platelet count was 35,000.[2] The average serum bilirubin level was 0.95mg/dL. The average SGPT levels were 133units/L while average SGOT levels were 267units/L. The mean alkaline phosphates levels were 89units/L. 100% patients had an elevated SGOT level while 91% patients had elevated SGPT level (Table 4 and 5). There were 85% patients who had their SGOT level>2 x UNL, while 48% patients had SGPT levels>2 x UNL. In patients who had raised levels of both enzymes, the SGOT levels were 2-3 times higher than SGPT levels (Table 1 and 2). 50% patients had hepatomegaly or hepatosplenomegaly. 36 patients had hepatomegaly on ultrasonography and 27 of them had liver enlargement clinically as well. 15 patients had splenomegaly on USG of which only 3 had spleen enlargement clinically. 42 patients had evidence of ascitis on ultrasonography. Only 5 patients out these 42 had clinically detectable ascitis. Ascitis in all patients was minimal to mild. 15% patients had evidence of pleural effusion on USG/X-ray. 10% patients had evidence of leukopenia.

In the study done by Kumar S et al at Bangalore, Karnataka, India, a total of 100 patients of dengue fever were studied, out of which 70 patients had elevated AST levels and 73 had elevated ALT levels.[3] Fever followed by headache was the most common symptoms at presentation while vomiting and pain abdomen in the early stage suggested hepatic dysfunction. 46% of the patients had hepatomegaly, 15% of patients had splenomegaly with or without hepatomegaly. Pleural effusion was the second most common finding seen in 26% of patients at presentation. Icterus and ascites were seen in 13% and 14% of patients respectively (Table 3). AST and ALT were statistically higher in these patients and in those developing complications like DHF, DSS, hepatic failure, ARDS, ARF and encephalopathy.

In a study done by Prakash et al at Belgaum, Karnataka, India it was shown that 25% of the patients had an elevated total bilirubin level.[4] This was similar to a study done by Asim A et al in Lahore, Pakistan in 2014 where he had divided the patient shaving elevated liver enzymes in to three groups i.e. mild (two-fold increase in LFT), moderate (3-4 fold increase in LFT) and severe (greater than 4 fold increase in LFT based on the degree of elevation of the liver enzymes.[5]

Kunal G et al showed that 85% of the patients had an elevated AST level.[6] ALT levels were raised in 73% of the patients, 32 of whom mild, 30 had moderate and 11 had severe elevation of the enzyme.

Present study also showed similar results as above previous studies that SGOT levels were higher in comparison to SGPT. In present study, it was noted that SGOT levels were raised in all patients, nearly 22% patients had SGOT levels more than twice the upper limit of normal. 56% of our patients had hepatomegaly with or without splenomegaly.[7] There are few reports of spleen enlargement in dengue infection.[8]

Ascitis was present in nearly 52% patients. This is an unusual finding in dengue. Ascitis in our patients were mild and detected usually on ultrasonography. Ascitis in dengue has been attributed to plasma leakage. However, there is one study which attributes portal hypertension in addition to plasma leakage for development of ascitis.[9] 30% of our patients had leukopenia. Leukopenia has been reported in dengue and has been attributed to transient marrow suppression by the virus.[10,11]

It is important to keep these features in mind particularly considering the fact that diagnosis of dengue may be difficult in some cases and ELISA for dengue may not be positive in first few days of infection.[12] We need a prospective study to see for liver enzymes within 24-48 hours of onset of fever and also to see whether SGOT levels are higher than SGPT levels.

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