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Original Research Article.

Gallbladder Wall Oedema in Primary Dengue Fever Patients: An Early Diagnostic Indicator for Dengue Fever

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ABSTRACT

Background: Dengue Fever is a mosquito borne viral disease caused by a flavivirus and is endemic in large areas of the south East Asia. Objective of the study is to investigate the frequency of acute acalculous cholecystitis in primary dengue fever patients and gall bladder edema in dengue fever and its association with platelet count.

Methods: The current study is a retrospective analysis of ultrasonographic features in patients presenting with primary dengue fever. This study is carried out at Hindu Rao Hospital, Delhi. In this study 50 dengue IgM antibody positive first time affected cases are taken, besides platelets count, Haematocrit analysis and thorough ultrasonography is done in all patients to look for gallbladder edema and cavitary effusion. Patients with history of Diabetes Mellitus, Tuberculosis, Cirrhosis of liver, viral hepatitis, congestive heart failure, chronic kidney disease, hypoalbuminemia and cholecystitis are excluded from the study.

Results: Gall bladder edema is commonly seen in patients with dengue fever. In our study 66% patients with Dengue Fever had gall bladder edema. P value was <0.0001 which is statistically significant. Average platelet count was 36,560/ul. Association was more with those patients without any hemorrhagic manifestation. None of the patient required cholecystectomy.

Conclusions: USG has been reported to be a useful diagnostic tool in evaluating patients with Dengue Fever. The main pathophysiologic change in Dengue Fever could be increased vascular permeability, causing plasma leakage and serous effusion with high protein content which induces thickening of the gallbladder wall. Acalculous cholecystitis should be suspected in a case of Dengue Fever presenting with abdominal pain, fever, mild elevation of transaminases and thickened gallbladder wall without stones on ultrasound. In Dengue Fever patients with acute acalculous cholecystitis, the course of Dengue Fever could be self-limiting and the gall bladder wall could return to normal after several days. Cholecystectomy in Dengue Fever complicated by acalculous cholecystitis is rarely required. Abdominal ultrasound should be made routine in case of Dengue Fever because it may support the early clinical diagnosis. As per PCR (RT PCR) of dengue virus RNA is accurate method but are too expensive to be done for all patients in developing countries. In experience, close monitoring of vitals is required and conservative management is sufficient and helpful in patients.

Keywords: Dengue Fever, Flavivirus, Gallbladder Wall Edema, Acalculous Cholecystitis, Hypoalbuminemia, Cholecystectomy.

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INTRODUCTION

Dengue fever is a mosquito borne viral disease caused by a flavivirus and is endemic in large areas of the Southeast Asia.[1] The incidence of dengue fever and dengue fever with complications has increased thirty folds globally in the last four decades and more than half the world's population (including developed countries) is now threatened with infection from dengue virus.[2] In India, more than 50 outbreaks have been reported by the National Institute of Communicable diseases, New Delhi since 1963. Dengue virus infection manifests with wide range of severity from asymptomatic mild febrile illness to life threatening disease including haemorrhagic manifestations and severe dengue. The clinical picture of classic dengue begins with a high grade fever, intense headache and myalgia, prostration, nausea, vomiting and arthralgia. Various atypical manifestations of dengue virus infection, including fulminant hepatitis, encephalopathy, cardiomyopathy, acute pancreatitis, and acalculous cholecystitis

have been reported during recent years.[3-5] Abdominal pain is a commonly reported symptom in dengue fever. The reported causes of abdominal pain in dengue fever include hepatitis, pancreatitis, acalculous cholecystitis and peptic ulcer disease.[7] The clinically overlapping manifestations of dengue virus and bacterial infections make it difficult, if not impossible, to distinguish these infection entities from each other.

Radiographic findings of dengue fever have not yet been clearly elucidated in relation to clinical and serological findings, despite the fact that two-fifths of the world population lives in areas where the virus is endemic.

MATERIALS AND METHODS

The current study is a retrospective analysis of ultrasonographic features in patients presenting with primary dengue fever (during the outbreak of Dengue Fever) admitted at Hindu Rao Hospital, New Delhi.

Inclusion Criteria

1. Indoor patients diagnosed with dengue (positive IgM dengue serology).
2. Patients having manifestations of dengue fever for the first time.

Exclusion Criteria

1. History of Diabetes, TB, cirrhosis liver, viral hepatitis, chronic kidney disease, congestive heart failure and Hypoalbuminemia.
2. Patients with past history of Dengue Fever.
3. Patients with past history of Cholecystitis/Cholecystectomy

RESULTS

Gall bladder edema is commonly seen in patients with dengue fever. In our study 66% patients with Dengue Fever had gall bladder edema. P value was <0.0001 which is statistically significant. Average platelet count was 36,560/ul. Association was more with those patients without any hemorrhagic manifestation. None of the patient required cholecystectomy.

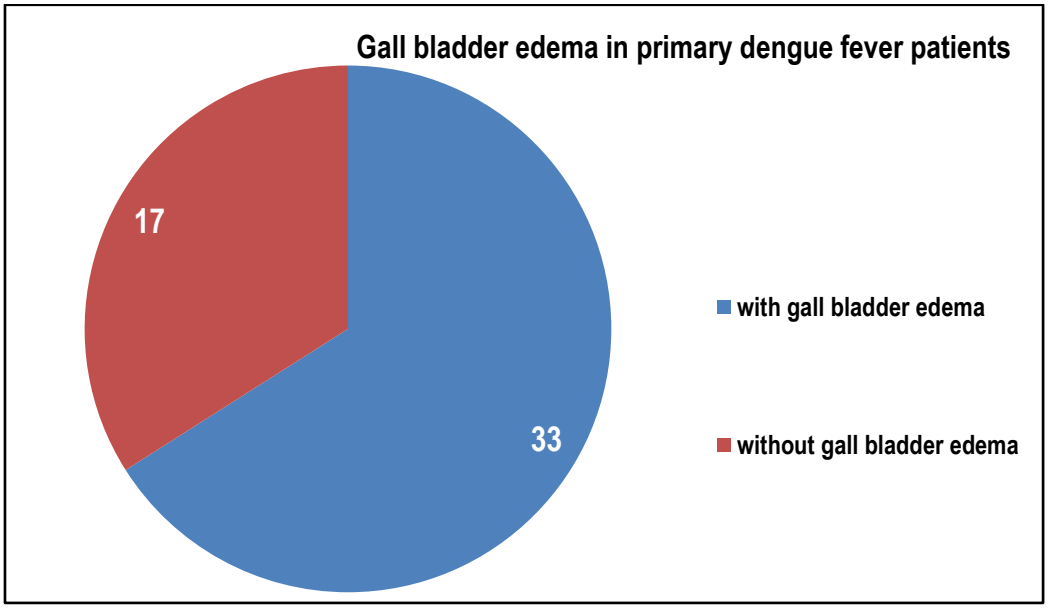

Fig 1: Gall bladder edema in primary dengue fever patients

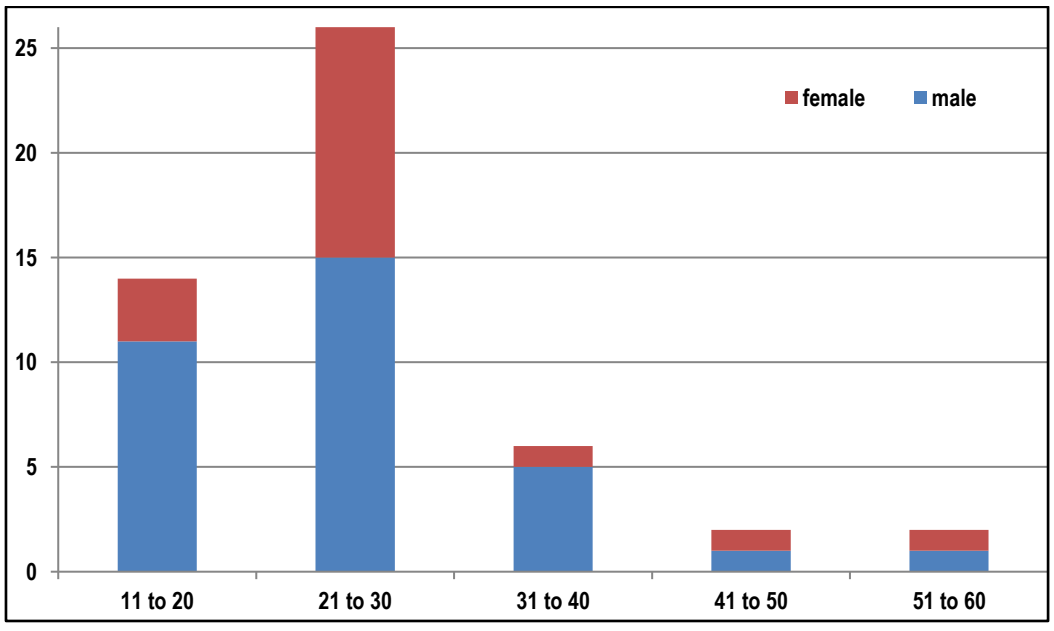

Fig 2: Age and sex distribution of dengue fever patients

REVIEW OF LITERATURE

Dengue fever is endemic in tropical and subtropical areas. Dengue fever is estimated by the World Health Organization to cause about 50-100 million infections per year worldwide. Increased capillary permeability is the main feature of DHF, represented by increased capillary permeability, with leakage of albumin out of the vascular space, leading to cavitary effusion and hemoconcentration with increase in the hematocrit levels described as polyserositis [6,7] classified into mild and severe, according to the World Health Organization criteria.[8] The exact pathogenesis of acute acalculous cholecystitis is obscure but cholestasis and increased bile viscosity from prolonged fasting, spasm of the ampula of vater, infection, endotoxaemia, microangiopathy and ischaemia-reperfusion injury, among other causes have been suggested.[9] The pathophysiology in the development of acute acalculous cholecystitis from infection with dengue virus is unknown. Polyserositis is associated to hemorrhagic manifestations and thrombocytopenia.

It is well established in the literature that, typically, the hypotension secondary to this plasma leakage occurs up to 48 hours after defervescence, the moment of fever abatement where the fever decreases to less than 38ºC. The sonographic signs of plasma leakage, particularly pleural effusion, may be early identified, up to two days before defervescence, preceding changes in hematocrit levels.[10] Despite the nonspecificity of sonographic findings, ultrasonography is useful for the early diagnosis in patients with Dengue Hemorrhagic Fever and for differential diagnosis of other febrile diseases.[7] The objective of the present literature review is to describe the main sonographic findings and evaluating the role of ultrasonography in the assessment of patients with suspected dengue hemorrhagic fever. Frequent sonographic findings in a case of dengue include a thickened gallbladder wall with pericholecystic fluid, ascites, splenomegaly, and pleural effusion which is commonly Right-sided.[3-14]

Gallbladder edema is found to be more common in cases of secondary dengue and there is a tendency for gallbladder edema to be associated with higher increase of hematocrit[17] and greater severity of illness.[18] In some studies, this finding has been a relevant marker for clinical diagnosis and indicator of severity of DHF in children.[15-18]

DISCUSSION

Dengue is the most significant mosquito-borne viral disease in the world today. Approximately 3 billion people worldwide live in areas at risk for transmission of the dengue flavivirus by the Aedes aegypti mosquito, and an estimated 100 million people worldwide are infected with the virus each year. Clinical manifestations of the virus include dengue fever without warning signs, dengue fever with warning signs and severe dengue. The classic symptoms of Dengue fever include high fever, headache, musculo-skeletal pain, retro-orbital pain, and rash. Pain in abdomen is considered as one of the warning symptom of dengue. Laboratory findings include variable degree of Thrombocytopenia, neutropenia followed by lymphocytosis often with atypical lymphocytes. There may be a mild elevation in liver enzymes. Specific diagnosis consists of demonstration of specific IgM antibody which appears in serum by day 5 after onset and persists for 2 to 3 months. It indicates an active or a recent infection[19,20] and it can be negative in early cases of primary Dengue Fever. As PCR (RT PCR) of dengue virus RNA has been developed as a sensitive and accurate method but these are too expensive to be done for all patients in developing countries.

Ultrasonography has been reported to be a useful diagnostic tool in evaluating patients with Dengue Hemorrhagic Fever. It may usefully support the early clinical diagnosis of dengue haemorrhagic fever. The main pathophysiologic change in Dengue Fever could be increased vascular permeability, causing plasma leakage and serous effusion with high protein content which induces thickening of the gallbladder wall. Acalculous cholecystitis should be suspected in a case of Dengue Fever presenting with abdominal pain, fever, a positive Murphy's sign, mild elevation of transaminases and a thickened gallbladder wall without stones on ultrasonography. In Dengue Fever patients with acute acalculous cholecystitis, the course of Dengue Fever could be self-limiting and the gallbladder wall could return to normal after several days. Cholecystectomy in a case of dengue fever complicated by acalculous cholecystitis is rarely required and hence the patient should be closely observed for signs of perforation. Adequate hydration, antipyretics and platelet-transfusion in cases with severe thrombocytopenia may be all they need. There have been numerous studies[14-18] supporting the role of ultrasonography in a case of dengue fever. Abdominal ultrasonography should be made a routine in cases of dengue fever as it may help in the clinical diagnosis as well as early detection of complications as in our case's which enables us to reduce morbidity and recommend close follow up. Our patients were managed conservatively. They improved completely and discharged thereafter. None of the patients needed cholecystectomy. In our experience, close monitoring of vitals is required and conservative management is helpful in these patients.

CONCLUSION

Dengue epidemics have Gallbladder been occurring in India from time to time. Gall bladder edema is commonly seen in patients with dengue fever. In our study 66%patients with dengue fever had gall bladder edema. p value was <0.0001 which is statistically significant.

Sonographic features of thickened Gallbladder wall, pleural effusion (bilateral or right side), ascites, hepatomegaly and splenomegaly should strongly favor the diagnosis of dengue fever in patients presenting with fever and associated symptoms, particularly during an epidemic. A simple ultrasound examination will effectively expedite the diagnosis and justifies initiation of specific treatment for dengue fever pending serological confirmation. Ultrasound also helps substantially in estimating the severity of the disease. Preponderance was seen in the patients between 11 to 30 years suggesting it to be more common in young age group, more in males than in females. Average platelet count at which the results were obtained was 36,560/ul. Association was more with those patients without any haemorrhagic manifestations. None of the patient required any surgical intervention. In our experience timely conservative treatment is sufficient and proper diet. The findings are well above in comparison to previous studies. Thus, prospective study with larger population size and equal age distribution is required for better results.

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