Research Paper

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Early Abdominal Sonographic Findings: A Boon in Patients with Acute Dengue Fever

Medical Science

KEYWORDS : Dengue Fever, USG, Pleural effusion, Ascites, Splenomegaly

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ABSTRACT

Dengue fever (DF) is a major public health problem with increased incidence in the recent years. DF mimics any viral fever and hence there is a delay in the diagnosis and treatment. It is diagnosed based on clinical findings and serological analysis, but serology takes more than a week to give a positive result. Ultrasound plays an important role as a prognostic indicator to assess patients at risk of entering the critical phase. We conducted a study of 32 patients to evaluate the early sonographic findings in dengue fever before serology is positive. Ultrasonography of the abdomen and pelvis was performed using 3-7MHz convex probe and 9-12 linear probe. In addition to this chest sonography was assessed for any pleural effusion. GB wall thickening is measured by placing the calipers between the two layers of anterior wall. All patients with signs and symptoms of either fever, headache, myalgia, rashes, nausea, vomiting and abdominal pain with findings of dengue fever with low WBC and platelets were included in the study. Patients treated previously for dengue fever and currently asymptomatic were excluded.

Gall bladder wall thickening, bilateral pleural effusion, splenomegaly and ascites were most prominent findings which can help in diagnosing patients early in acute dengue fever.

INTRODUCTION

Dengue fever (DF) is a major public health problem with increased incidence in the recent years. DF mimics any viral fever and hence there is a delay in the diagnosis and treatment. It is diagnosed based on clinical findings and serological analysis, but serology may not be available or may take 1-2 days to give a positive result.[1]

Ultrasound plays an important role as a prognostic indicator to assess patients at risk of entering the critical phase. These patients can be identified early and hence hospital resources could be more efficiently allocated. Ultrasound is a cheaper, less invasive modality to monitor for plasma leakage (ascites) of these patients. So, we planned a study of 32 patients to evaluate the early sonographic findings in dengue fever before serology is positive.[4,6]

MATERIAL AND METHODS

A study of 32 patients was conducted to evaluate the early sonographic findings in dengue fever before serology is positive.

Source of data

A Prospective study of 32 Patients was performed during the epidemic phase of dengue fever in department of V. S. Radiology from September 2012 to November 2012.

Method of collection of data

Ultrasonography of the abdomen and pelvis was performed using 3-7MHz convex probe and 9-12 linear probe. In addition to this chest sonography was assessed for any pleural effusion. Abdominal scanning was done after 6 h of fasting to allow better distension of gall bladder (GB). GB wall thickening is measured by placing the calipers between the two layers of anterior wall. Thoracic scanning was done in either sitting or supine posture. Both the pleural spaces were evaluated through an intercostal approach. All patients underwent serology testing for confirmation of DF. Positive serology was defined as a 4-fold or greater change in reciprocal IgG antibody titers to 1 or more dengue virus antigens in paired serum samples or a positive IgM antibody test on a late acute phase or convalescent-phase serum specimen by enzyme-linked immunosorbent assay.

Patient Inclusion criteria

Patients with signs and symptoms of either fever, headache, myalgia, rashes, nausea, vomiting and abdominal pain with low WBC and platelets were included in the study. Also patients with fever associated with low WBC and platelets were included in the study. All age and all gender patients were included.

Patient Exclusion criteria

Patients treated previously for dengue fever and currently asymptomatic were excluded.

Study design

Hospital based prospective observational study.

Ultrasound criteria for diagnosing the disease:

GB wall thickness, Splenomegaly, Pleural effusion, free fluid in abdomen and pelvis and Lymph nodes

OBSERVATION AND ANALYSIS

In our study Gender distribution (male: female) ratio was 1.4:1. The mean ± SD duration of fever at the time of their abdominal sonography was 3.7 ± 2.0 days. Gall bladder wall thickening was commonest finding ranging from 9-12mm (Figure-2) and was found in 28 (87.50%) patients.

USG findings	No. of cases (32)	Percentage
GB wall thickened	28	87.50%
Splenomegaly	23	72%
Pleural effusion	23	71.88%
Free fluid in abdomen & pelvis	18	56%
Lymph nodes	16	50%

Table-1 Ultrasonography findings in dengue fever

Splenomegaly was found in72% of patients. Splenomegaly ranges from long axis 12-16 cm. Pleural effusion, ascites and enlarged lymph node were found respectively in 23(71.88%), 18(56%) and 16(50%) of patients.

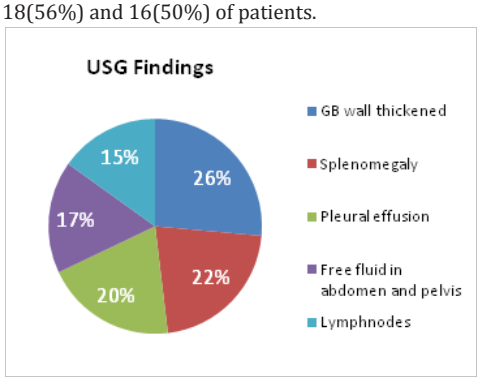

Figure-1 USG Findings

Figure-2 Gall bladder wall thickening in USG

Pleural effusion was found to be common in Dengue fever. Unilateral rights and left sided pleural effusion was found in 7 and 2 cases respectively. Bilateral pleural effusion was found in 14 cases.

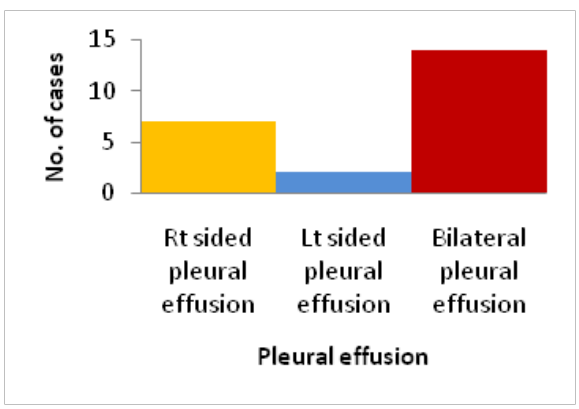

Figure-3 Pleural effusion

Figure-4 Pleural effusion seen in USG

The diagnosis of dengue fever was subsequently confirmed by serology in 25 patients out of 32 patients (78%). Laboratory findings commonly associated with DF include neutropenia, lymphocytosis, increased concentration of liver enzymes, and thrombocytopenia.

DISCUSSION

Dengue fever (DF) is an acute mosquito-transmitted viral infection caused by 1 of 4 virus serotypes (DEN-1, DEN-2, DEN-3, and DEN-4) of the genus Flavivirus.[1]

It is the most common arboviral disease in the world and in recent years has become a major international public health problem[1].The dengue epidemics in India are cyclical and are more frequent, expanding geographically into the rural areas and all forms of serotypes are circulating in the community[2]. Clinically dengue manifests with acute onset of fever, severe headache, retro-ocular pain and pain involving the muscles and joints. Haemorrhagic diasthesis and thrombocytopenia with concurrent haemoconcentration is a constant finding.

Since there is no single test that can be used to diagnose the condition with a reasonable degree of accuracy and reliability, the diagnosis is based on clinical appearance in combination with serology. Serology might not be always available and may take 1-2 days to give a positive result[3,4].

The main pathophysiologic change in DF is an increased vascular permeability, causing plasma leakage and serous effusion with a high protein content (mostly albumin). It occurs subsequent to an increase in chemotaxic factors released by inflammatory cells and endothelial damage caused by the dengue virus.[5]

Ultrasound allows a clinician to detect capillary leakage in form of the gallbladder wall thickening, ascites and pleural effusion as well as inflammation of liver and spleen as hepatomegaly and splenomegaly in patients with dengue.[6,7]

CONCLUSIONS

Abdominal sonography can be used as a major first-line imaging modality in patients with suspected acute dengue fever, to detect early signs suggestive of the disease before obtaining serologic confirmation test results.

In an area a recurrent Acute Dengue Fever (DF) epidemics like Ahmedabad, when sonography shows a thickened gallbladder wall, ascites, splenomegaly, and pleural effusion, in an acute febrile patient with thrombocytopenia, DF should be considered as the diagnosis until it is proved otherwise.

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REFERENCE

[ ] Venkata Sai PM, Dev B, Krishnan R. Role of ultrasound in dengue fever. Br J Radiol. 2005;78:416–8. | [ ] Setiawan MW, Samsi TK, Wulur H, Sugianto D, Pool TN. Dengue hemorrhagic fever: Ultrasound as an aid to predict the severity of the disease. Pediatr Radiol 1998;28:1-4. | [ ] Balasubramanian S, Janakiraman L, Kumar SS, Muralinath S, Shivbalan S. A reappraisal of the criteria to diagnose plasma leakage in dengue hemorrhagic fever. Indian Pediatr. 2006;43:334–9 | [ ] Guzman MG, Kouri G: Dengue: an update. Lancet Infect Dis 2002, 2:33-42. | [ ] Gubler D. Dengue and Dengue Haemorrhagic Fever. Clin Microbiol Rev 1998; 11:480-96. | [ ] Joshi P, Rathnam VG, Sharma S. USG findings in dengue haemorrhagic fever – our experience in the recent epidemic. Ind J Radiol Imag1997;7:189–92. | [ ] Kumar P, Clark M. Clinical Medicine. Fourth Ed. WB Saunders, 2002. |