

Ultrasound findings in dengue fever

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Abstract

Dengue is prevalent in countries like India. Abdominal USG can be used as a first-line imaging modality and also prognostic marker in patients with suspected DHF. **Methods:** We performed Retrospective study, In 78 serologically positive pediatric patients who were admitted with us from January 2013 to January 2015. **Results:** gall bladder wall thickening and edema was found in 82% of USG done within three days of illness and in all patients after 3 days of illness. Followed by right sided pleural effusion and ascitis. **Conclusion:** Abdominal ultrasonography should be made a routine investigation in cases of dengue fever as it helps in the clinical diagnosis as well as early detection of complications.

Key Word: Dengue, ultrasound.

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INTRODUCTION

Dengue is an acute viral infection with potential fatal complications. The word “dengue” is derived from the Swahili phrase Ka-dinga pepo, meaning “cramp-like seizure”. The first clinically recognized dengue epidemics occurred almost simultaneously in Asia, Africa, and North America in the 1780s. Dengue viruses (DV) belong to family Flaviviridae and there are four serotypes of the virus referred to as DV-1, DV-2, DV-3 and DV-4. DV is a positive-stranded encapsulated RNA virus and is composed of three structural protein genes, which encode the nucleocapsid or core (C) protein, a membrane-associated (M) protein, an enveloped (E) glycoprotein and seven non-structural (NS) proteins. It is transmitted mainly by Aedes aegypti mosquito and also by Ae. albopictus. All four serotypes can cause the full spectrum of disease from a subclinical infection to a mild self-limiting disease, the dengue fever (DF) and a severe disease that may be fatal, the dengue haemorrhagic

fever/dengue shock syndrome (DHF/DSS). The WHO 2009 classification divides dengue fever into two groups: uncomplicated and severe¹, though the 1997 WHO classification is still widely used.² Abdominal USG can be used as a first-line imaging modality in patients with suspected DHF to detect early signs that are suggestive of the disease prior to obtaining serologic confirmation test results, especially in a dengue fever epidemic area. Also, reducing GB wall thickness can be used as a prognostic sign in cases of DHF.³ Sachar *et al* 2013 suggested a specific change – “Honeycomb” pattern in the thickened gallbladder (GB) wall (mostly in the fundal area) – on USG suggested the diagnosis of DHF. And they also mentioned that treatment can be started on the basis of this sign before serological workup comes positive also labeled it as Sachar and Sunder’s sign.³

METHODOLOGY

Our study is Retrospective study, conducted at tertiary care hospital. In 78 pediatric patients who were admitted with us from January 2013 to January 2015.

Inclusion Criteria: 130 patients who were having suspected dengue like illness were underwent sonography out of them 52 patients were turned out to be serologically negative those were excluded from our study. Only 78 patients who were of confirmed Dengue were included in our study. All ultrasound examinations were performed with Aloka Prosound SSD3500SV model using 3.5 MHz and 5-10 MHz probes. Abdominal scanning was done after 6 hr of fasting to allow better

distension of gall bladder(GB)⁴ GB wall thickening, which was the consistent finding in all the serologically positive cases, was measured by placing the calipers between the two layers of anterior wall⁵ Thoracic scanning was done in either sitting or supine posture. Both the pleural spaces were evaluated through an intercostal approach. Pericardial space was also evaluated for effusion subcostally. The 78 serologically positive patients were then sorted into two groups based on the days of study. Group I(n=34) included patients who had symptoms and signs consistent with DF and in whom ultrasound was performed on the second to third day after onset of fever. These patients also had a follow up scan on fifth to seventh day. Group II(n=44) included patients who underwent ultrasound only on fifth to seventh day after onset of fever.

RESULTS

Out of total 130 patients who were clinically dengue suspects only 78 were confirmed to have dengue serologically. In Group I in 34 patients where First USG was done early in course of illness (i.e. on second or third day of illness only) and in same group follow up USG was done during fifth to seventh day of illness. In Group II in 44 patients where First USG was done only on fifth to seventh day after onset of fever.



Figure 1



Figure 2



Figure 3

Legend

Figure 1: Shows GB wall thickening with Odema

Figure 2: Showing GB Odema with Pericholecystic fluid with, Splenomegaly with Lt Pleural reffusion

Figure 3: showing Ascites and Rt Pleural effusion

DISCUSSION

Dengue is an acute febrile viral disease caused by flavivirus. It occurs in two forms: DF, a milder form of the disease and DHF, the most severe form. Dengue has become a major international public health concern in recent years (6,7).

The onset of the disease is recognized by the sudden onset of high fever, retro-orbital pain, thrombocytopenia and haemorrhagic manifestations. Common laboratory findings include pancytopenia, neutropenia, increased

Table 1: Profile of total 78 seropositive cases of dengue

Day of examination	Number of cases
2 nd -3 rd day	34
5 th -7 th day	44+34(follow up of Group I)

Table 2: USG findings in Group I

Days of examination	2 nd 3 rd day	5 th to 7 th day
Only Gall bladder wall thickening	28(82.3%)	34(100%)
Gall bladder wall thickening with pericholecystic fluid	6(17.6%)	34(100%)
Hepatomegaly	0(0%)	4(11.7%)
Splenomegaly	8(23.5%)	3(8.8%)
Right sided pleural effusion	10(29.4%)	27(79.4%)
Left sided pleural effusion	0(0%)	18(52.9%)
Ascites	8 (23.5%)	26(76.4%)
Pericardial Effusion	0(0%)	15(44.1%)

Table 3: USG findings in Group II

Days of examination	5 th to 7 th day
Gall bladder wall thickening with pericholecystic fluid	44(100%)
Hepatomegaly	03(6.8%)
Splenomegaly	26(59%)
Right sided pleural effusion	43(97.72%)
Left sided pleural effusion	31(70.45)
Ascites	38(86.36%)
Pericardial Effusion	16(36.6 %)

evaluate the ultrasound findings in DF, to find whether ultrasound of the abdomen is an important adjunct to clinical and laboratory profile in diagnosing DF and further if ultrasound is useful in predicting the severity of the disease. The ultrasound findings in early milder form of DF include GB wall thickening, pericholecystic fluid, minimal ascites, pleural effusion, pericardial effusion and hepato-splenomegaly. Severe forms of the disease are characterized by fluid collection in the perirenal and pararenal region, hepatic and splenic subcapsular fluid, pericardial effusion, pancreatic enlargement and hepatosplenomegaly. These findings have been demonstrated in studies carried out by the Department of Child Health in Indonesia^{6,8} and by Joshi *et al*^{6,9} in Army Hospital, Delhi Cantt. They had also found abnormal liver parenchyma, which has been attributed to intraparenchymal and subcapsular haemorrhages. None of these studies suggested GB wall thickening as the initial finding in DF (100%) as observed in our study, followed and pleural effusion. GB wall thickening in DF may be due to decrease in intravascular osmotic pressure. These findings may also occur in other. Viral infections, enteric fever and leptospirosis, but in other viral infections the historical profile, symptom complex evolution and physical findings do not mimic those of DF. Ultrasound features of enteric fever include splenomegaly, intra-abdominal lymphadenopathy, bowel abnormalities in the form of intramural thickening of the terminal ileum and caecum, renal abnormalities like arteriectasis and perinephric fluid collection in addition to GB wall thickening and polyserositis. Leptospirosis also shows gross abnormalities involving hepatic and renal parenchyma. GB wall thickening also occurs in association with other conditions such as ascites,

hypalbuminaemia, congestive cholecystopathy and in patients with cirrhosis of liver and portal hypertension. It is a very non-specific finding when considered in isolation and is therefore a major limitation of this study.

CONCLUSION

Abdominal ultrasonography should be made a routine investigation in cases of dengue fever as it helps in the clinical diagnosis as well as early detection of complications.

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