

Original Research Article

Retrospective analysis of ultrasound features of dengue infection

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ABSTRACT

Background: Dengue infection is an extremely common infection in tropical countries. It is considered to be prevalent all-round the year. The aim of the study was to analyse the ultrasound features of serologically proven dengue cases. To correlate the platelet count with ultrasound features of dengue.

Methods: Study included dengue patients admitted from January 2011 to December 2012. Dengue was diagnosed by IgM antibody test. All patients underwent ultrasound evaluation and platelet count testing.

Results: most common finding was ascites in 43 cases (39.8%), splenomegaly in 41 cases (37.9%), right sided pleural effusion in 25 cases (23.4%), gall bladder wall thickening was present in 30 cases (27.7%) and hepatomegaly was present in 20 cases (18.5%). Presence of most of the features of ultrasound evaluation correlated with a platelet count of less than 40000 cells/mm³.

Conclusions: The commonest sonographic findings were ascites and splenomegaly followed by pleural effusion and gall bladder wall thickening. Thus, presence of these ultrasound features in a febrile patient may be suggestive of dengue fever and presence of all the sonographic features may suggest a low platelet count.

Keywords: Ascites, Gall bladder wall thickening, Sonography, Splenomegaly

INTRODUCTION

Dengue is an extremely common Arboviral infection seen worldwide and highly prevalent in tropical countries. There are approximately 50 million new dengue infections occurring each year. There are about 2.5 billion people living in dengue endemic areas worldwide.¹ The incidence of dengue has been steadily increasing in the last 5 decades.

The spectrum of dengue infections includes classical dengue fever, dengue hemorrhagic fever and dengue shock syndrome. Epidemic dengue is an emerging health problem in South East Asian countries where the vector of dengue infection *Aedes Egypti* is widely prevalent and is leading to increasing hospitalisation of both children and adults.² Our present study is a retrospective analysis of ultrasound findings in serologically proven dengue

cases. It also correlates the ultrasound findings with platelet levels.

METHODS

This study was done at PSG Hospital, Coimbatore. The study consisted of a retrospective analysis of 108 serologically proven dengue cases (IgM ELISA positive) admitted between January 2011 and December 2012.

Inclusion criteria included patients above 15 years and other tropical infections including malaria, typhoid scrub typhus and hepatitis were excluded from this study. These patients had undergone platelet count testing by coulter. Ultrasound evaluation of abdomen and thorax was done using Siemens Accuson S3000 and Philips IU 22 machines with 3-5 MHz transducers. Dengue serology was done by Elisa method.

RESULTS

The spectrum of findings in our study included gall bladder wall thickening, pleural effusion, ascites, hepatomegaly and splenomegaly. Out of 108 patients, 30 had gall bladder wall thickening (27.7%), 13 had bilateral pleural effusion (12.03%), 25 had right sided pleural effusion (23.4%). There were no cases of isolated left pleural effusion. 43 patients had ascites (39.8%), 20 had sided hepatomegaly (18.5%), 41 had splenomegaly (37.9%). 40 patients had normal ultrasound studies (37.4%).

Correlation of platelet count with imaging findings

- Gall bladder wall thickening was seen in 19.4% of patients with platelet count less than 40000 and in 5.5% of patients with less than 1 lakh,
- Other common findings in cases with platelet less than 40000 included ascites (28.7%) and pleural effusion (25.8%),

- The commonest finding in our study was ascites followed by pleural effusion and gall bladder wall thickening,
- Out of 41 cases of splenomegaly 14.8% were seen in cases with platelet count less than 40000 cells/mm³ and in 11.85% of cases with platelet counts between 40000 to 1 lakh cells/mm³.

Table1: Incidence of different sonographic findings in dengue fever.

Ultrasound findings	Cases	Percentage
Gall bladder wall thickening	30	27.7
Bilateral pleural effusion	13	12.03
Right sided pleural effusion	25	25
Ascites	43	39.8
Splenomegaly	41	37.9
Hepatomegaly	20	18.5
Hepatosplenomegaly	8	7.4
Normal study	40	37.4

Table 2: Correlation of ultrasound findings with platelet count.

USG findings	<40000 cells/mm ³	40000-1 lakh Cells/mm ³	1-1.5 lakhs cells/mm ³	>1.5 lakhs cells/m ³
Gall bladder wall thickening	21 (19.4)	6 (5.5)	3 (2.7)	0
Pleural effusion	28 (25.9)	8 (7.4)	1 (.9)	1 (.9)
Ascites	31 (28.7)	10 (9.2)	1 (.9)	1 (.9)
Hepatomegaly	12 (11.1)	3 (2.7)	4 (2.8)	1 (.9)
Splenomegaly	16 (14.8)	2 (1.8)	9 (8.3)	4 (3.7)

DISCUSSION

Dengue is considered to be one of the most important tropical infections in the world. Dengue infection has increased by thirty-fold worldwide in the last five decades. It is considered to be endemic in at least 100 countries. Severe dengue is an important cause for morbidity and death in adults and children in Asian countries.

Dengue in India has been endemic in 16 states since the beginning. India contributes about 34% of the global burden of dengue infection.³ From 2011-2012 dengue has spread to the remaining states.⁴

There has been a steady increase in dengue cases in India from 2010 onwards. The principal vector of dengue fever is the *Aedes aegypti* mosquito. The other species which can transmit dengue is the *Aedes albopictus* mosquito. This virus can undergo transovarian transmission.⁵

Ultrasound findings in dengue infection include gallbladder wall thickening, ascites, pleural effusion and hepatosplenomegaly. In very severe cases subcapsular

collection of fluid in liver, spleen and fluid accumulation around the kidney can happen. Pericardial effusion can also occur.⁶ Our study had gallbladder wall thickening in 27.7% of cases. The differential diagnosis of gallbladder wall thickening includes acute cholecystitis, pancreatitis, hepatitis and diverticular disease.⁷ Hence it is considered to be a very nonspecific finding.

In a study by KS Vedaraju et al the incidence of gall bladder wall thickening was 83.3%, ascites was 53.9%.⁸ These values were much higher compared to the results obtained in our study. In another study by Sunita Bajaj et al hepatomegaly was the most common finding in 74.5%. This was in contrast to our study which had an incidence of hepatomegaly of 18.5%.⁹

In a study by Dayanand et al, 17.9% of patients had isolated left sided pleural effusion which was absent in our study.¹⁰ Majority of the ultrasound findings in our study was associated with a platelet count of less than 40000 cells/mm³. This may suggest that patients with all the ultrasound findings may eventually go on to develop low platelet counts. This was similar to the study by Santosh VK et al.⁶

CONCLUSION

The most common ultrasound findings in dengue cases in our study were ascites followed by splenomegaly. Other findings included gall bladder wall thickening, pleural effusion and hepatomegaly. Presence of these ultrasound findings in a febrile patient supports the diagnosis of dengue infection. Also, a significant proportion of the ultrasound findings correlated with a platelet count of less than 40000cells/mm³. Limitations of this study are that the ultrasound findings were not correlated with age.

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Conflict of interest: None declared

Ethical approval: The study was approved by the Institutional Ethics Committee

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