



Radio-Diagnosis

ROLE OF ULTRASONOGRAPHY IN EVALUATION OF DENGUE PATIENTS

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KEYWORDS :

INTRODUCTION

Dengue fever is the most common and clinically significant arthropod-borne viral illness affecting humans worldwide and represents one of the most important emerging tropical viral diseases today. It is caused by the dengue virus, a single-stranded positive-sense RNA virus belonging to the genus *Flavivirus* of the *Flaviviridae* family. The virus exists as four antigenically distinct serotypes (DENV-1 to DENV-4). Transmission occurs primarily through the bite of infected *Aedes aegypti* mosquitoes, although other species such as *Aedes albopictus* may also act as vectors.

Globally, dengue poses a major public health challenge, with an estimated 50–100 million cases of dengue fever (DF) and approximately 500,000 cases of dengue hemorrhagic fever (DHF) requiring hospitalization annually. Over the past few decades, the incidence of dengue has increased dramatically, particularly in tropical and subtropical regions. This rise has been attributed to rapid urbanisation, population growth, increased international travel, and inadequate water management systems that promote mosquito breeding. In the South-East Asia region, dengue has become a leading cause of hospitalization and mortality among children, following diarrhoeal diseases and acute respiratory infections. Although traditionally associated with humid and high-rainfall regions, changing monsoon patterns have contributed to its spread into newer geographical areas, including the Deccan plateau and regions such as Karnataka [1].

In addition to clinical and imaging features, correlation with laboratory parameters is essential for comprehensive assessment and prognostication. Studies evaluating pediatric populations have shown that dengue can present with varied clinical manifestations including fever of acute onset, abdominal pain, vomiting, rash, flushed appearance, and bleeding tendencies. In a study conducted at General Hospital Jayanagar, Bangalore, involving 100 children with suspected dengue infection, cases were classified according to WHO criteria into dengue fever (36%), dengue hemorrhagic fever (33%), dengue shock syndrome (15%), and dengue-like illness (16%). The study highlighted that the clinical presentation, laboratory parameters, and radiological findings were consistent with other Indian studies, reinforcing the importance of integrated clinical, laboratory, and imaging evaluation for early diagnosis and better case management [1]. The present study is therefore undertaken to assess the various clinical manifestations of dengue fever, describe atypical presentations and complications, establish diagnosis based on serological markers (NS1 antigen, IgM, IgG antibodies), and evaluate the association between clinical findings, laboratory parameters, and radiological features. Such an integrated approach may help in early diagnosis, risk stratification, and improved management, thereby reducing morbidity and mortality associated with dengue infection.

Radiological imaging, particularly ultrasonography, plays a crucial role in the early detection and assessment of disease severity in dengue. Ultrasonography is a non-invasive, readily available, and cost-effective modality that can identify early plasma leakage even before clinical deterioration becomes evident. Common ultrasonographic findings associated with severe dengue include gall bladder wall thickening, ascites, pleural effusion, pericardial effusion, pericholecystic fluid, hepatomegaly, and splenomegaly. Among these, gall bladder wall thickening is considered one of the earliest and most

sensitive indicators of plasma leakage and correlates well with disease severity [1].

OBJECTIVES OF THE STUDY

- To diagnose dengue using ultrasonography.
- To evaluate sonographic features of dengue serology positive patients.

METHODOLOGY:

After obtaining approval and clearance from the Institutional Ethics Committee, subjects fulfilling the inclusion criteria will be recruited. Written informed consent will be obtained from all the study subjects, after fully explaining the study procedure to their satisfaction.

USG of abdomen and chest performed using MIND RAY with C6-2 curvilinear probe in both grey scale. Gallbladder wall thickening is measured between the two layers of the anterior wall by placing the calipers. Liver is scanned in both intercostal and subcostal approach. Spleen is scanned in intercostal view. Thoracic scanning is done in either sitting or supine posture.

Both the pleural spaces are evaluated through an intercostal approach

(a) STUDY DESIGN:

- Descriptive observational study

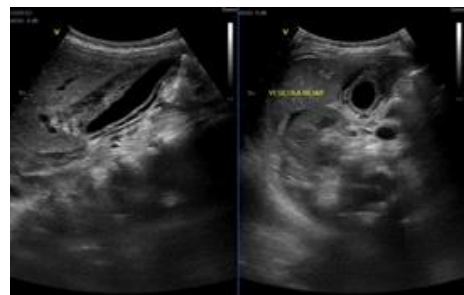
(a) STUDY PERIOD:

- 03 months

RESULTS:

There is no sex distribution, common age group was between 15-24 years. Capillary leak syndrome was found in 41 patients out of 50 patients (80.7%). Majority of them were between 15-24 years 34 patients (57.6%). Gall bladder wall thickening and pericholecystic fluid was found in majority 41 patient's (82%) followed by ascites in 24 (48%), whereas bilateral pleural effusion was observed in 6 (12%) cases only. Splenomegaly was present in 24 (48%) subjects.

FEATURES	NO. OF CASES	PERCENTAGE
GALL BLADDER WALL EDEMA	41	82%
ASCITES	24	48%
BILATERAL PLEURAL EFFUSION	06	12%
SPLENOMEGALY	24	48%



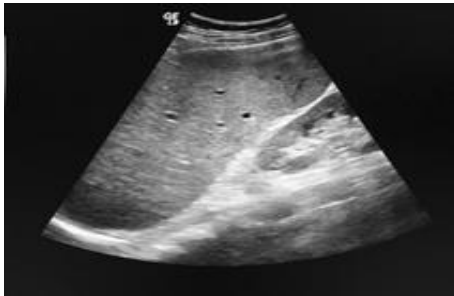
Case no.1 showing Gall bladder wall edema.



Case no 2 showing peritoneal ascites.



Case no 3 showing pleural effusion.

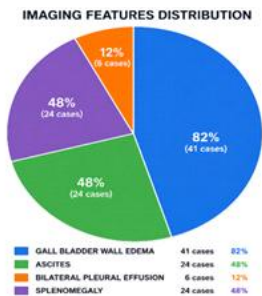


Case no 4 showing splenomegaly.

DISCUSSION :

In our study, commonly recognized abdominal sonological abnormalities include thickening of gall bladder wall, ascites, pleural effusion and Splenomegaly. Edematous thickened gall bladder wall was the most common finding in our study. Sensitivity of GB wall thickening with pericholecystic free fluid, ascites and pleural effusion were 76%, 46% and 42.5% with specificity of 91%, 93% and 100% respectively. Thus, the sonographic features had an increased specificity, but low sensitivity, Thus ultrasonography has a vital role in diagnosis of dengue and prevention of dreadful complications.

Piechart 1 representing imaging features of dengue:



CONCLUSION:

Ultrasound plays a crucial role in dengue evaluation and diagnosis with gall bladder wall edema being the most frequent and specific finding (82%), followed by ascites and splenomegaly (48% each). Pleural effusion is less common (12%). These imaging features aid early diagnosis, severity assessment, and timely management of dengue fever.

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