Original Article

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Retrospective Analysis of USG Findings in Dengue Fever as a Screening Modality

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Abstract

Background: Dengue fever is a common public health issue in India, This study was conducted to asses value of ultrasound findings in sero positive dengue cases. **Subjects and Methods:** Retrospective study of 81 patients of various age groups of both male and female, serologically positive for dengue fever was conducted between April-2018 to Dec-2018. These patients were referred for ultrasound of abdomen .Abdominal sonography was performed with convex probe and high frequency variable linear probes after 4-6 hours fasting .Various ultrasound finding were analyzed. **Results:** Out of 81 Patients Edematous gall bladder wall thickening/ edema seen in 71 (87.6%), most common findings, followed by ascites in 41 (50.6%) and Splenomegaly 17(20.9%), Hepatomegaly 15(18.5%) and pleural effusion 26 (32%). Ultrasound abdomen findings were normal in 10 (12.3%).In these Patients the platelet count was more than 150,000..Patients with platelets count up to 80000 showed GB wall thickening / wall edema,ascites, pleural effusion ,hepatomegaly and splenomegaly. Pericardial effusion was not seen in our study. **Conclusion:** Ultrasound abdomen findings of GB wall thickenings, GB wall edema, Pleural effusion, Ascites, Splenomegaly & Hepatomegaly strongly indicates diagnosis of dengue fever. These USG findings suggestive of severity of DF, which requirs proper managmeent. Subsequate USG examination helps to monitor the response to the treatment.

Keywords: Dengue fever, Gall bladder wall thickess/ edema, USG Abdomen, Ascities, Hepatomegaly, Splenomegaly. Pleural effusion.

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Introduction

The dengue fever, DF, is a common cause of fever in tropics including India, during July to Nov, more during the rainy seasons. Dengue is transmitted by Aedes aegypti mosquito which is widely found in tropical countries. There is increased incidence of DF.in last few years.[1,4] There are four known serotypes of DV (DEN-1, DEN-2. DEN-3 and DEN-4) of dengue. However severity of DF is usually by more than one serotype.[2,3] Patients of DF presents with high fever with chills of sudden onset , severe headache, body and joint pain. Fever usually last for 5-7 days.[3] The purpose of this study was to describe various sonographic findings in the sero posative proven cases of dengue cases. This is a retrospective study of proven cases of DF from July 2018 to Dec 2018, conducted in the department of radiology.

Subjects and Methods

This is a retrospective study of proven 81 cases of DF from July 2018 to Dec 2018, conducted in the department of radiology. Other causes of fever eg malaria, typhoid etc were excluded from the study. All age groups patients from both sex were included, ranging from 4 years to 67 years. Most of the patients (80.3%) were in the age group of 11 to 40 years. These cases were referred for ultrasound examination of abdomen after adequate 4-6 hrs fasting.[12] Various ultrasound findings were documented and analyzed. The ultrasound examinations were conducted with available USG units using convex and linear probes of variable frequency after 4-6 hours of fasting.

Results

The study was conducted in radiology department of LN medical college Bhopal from July 2018 to Dec 2018. The total number of the cases included in this study were 81 which were seropositive for dengue fever. The usg findings shows gall bladder wall edema /thickening in 71 cases (87.6%), ascitis in 41 cases(50.6 %), pleural effusion in 26(32%), splenomegaly in 17 cases(20.9%) and hepatomegaly in 15(18.5%). USG findings were normal in 10 cases in our study. There was strong correlation with degree of thrombocytopenia and these sonographic findings. The most common finding was edematous GB wall and second most common finding was ascites in the all patients especially in children and young adult.

Table 1: Age Distribution

Patient	Age wise distribution (In Years)		percentage
1	<10	2	2.4
2	11-20	21	25.9
3	21-30	33	40.7
4	31-40	11	13.5
5	41-50	6	7.4
6	51-60	5	6.1
	>60	1	1.2

Table 2: Sex Distribution

Sex wise			
Male		**Female**	
41	50.6%	40	49.4%

Table 3: USG Findings

USG Findings		
GB Wall Edema/Thickness	71/81	87.6%
Splenomegaly	17 /81	20.9%
Hepatomegaly	15/81	18.5%
Ascites	41/81	50.6%
Pl Effusion	26/81	32%
Normal	10/81	12.3%

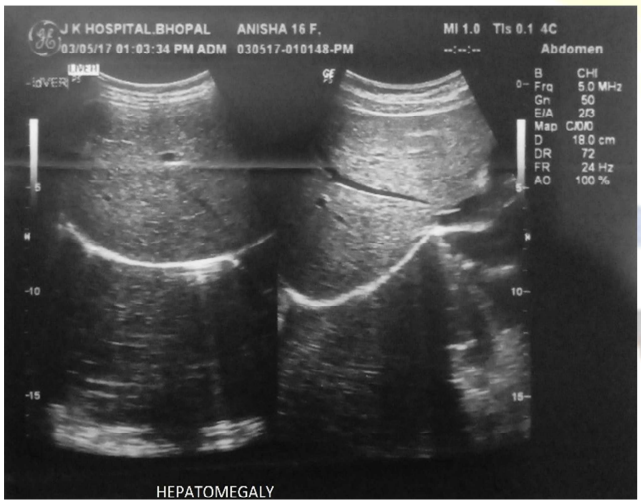

Figure 1: Hepatomegaly

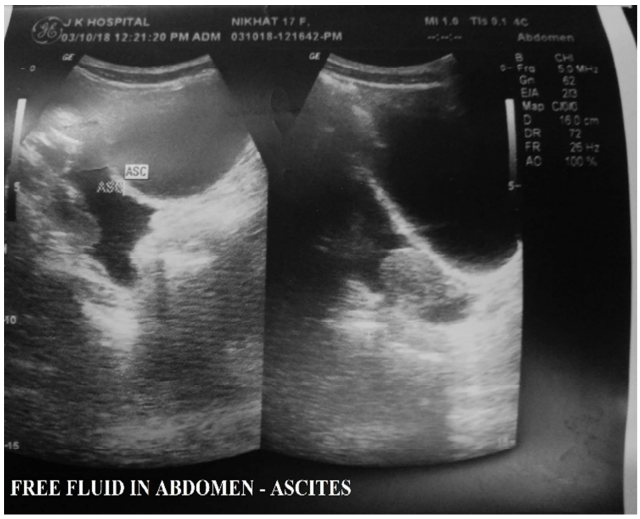

Figure 2: Free Fluid in Abdomen – Ascites.

Figure 3: Spleenomegaly with Ascites

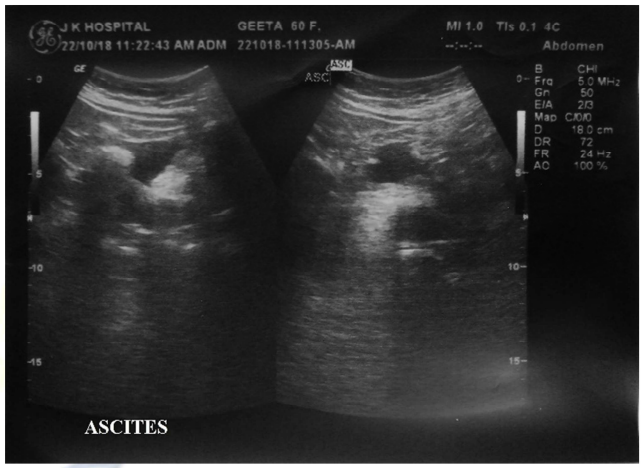

Figure 4: Ascites

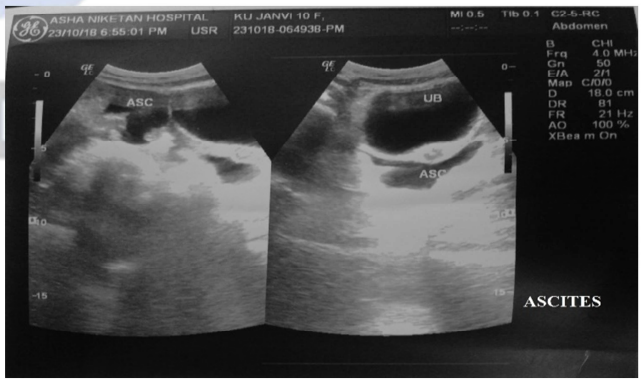

Figure 5: Ascites

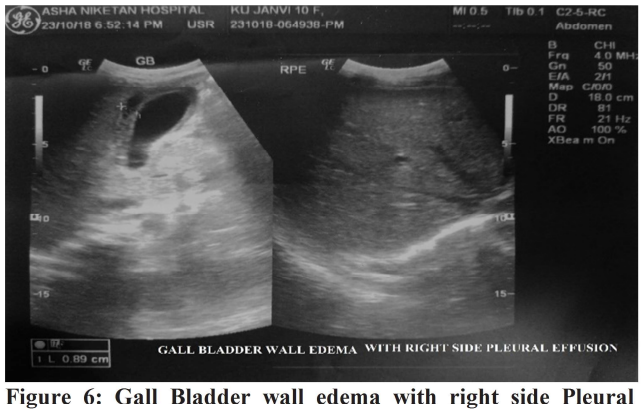

Figure 6: Gall Bladder wall edema with right side Pleural Effusion

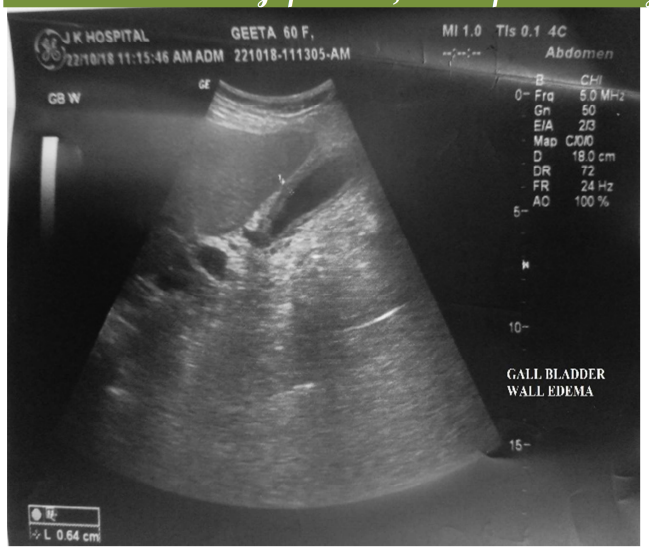

Figure 7: Gall Bladder wall Edema

Figure 8: Gall Bladder wall Edema

Figure 9: Gall Bladder wall Edema

Figure 10: Right Sided Pleural Effusion with gall bladder wall edema

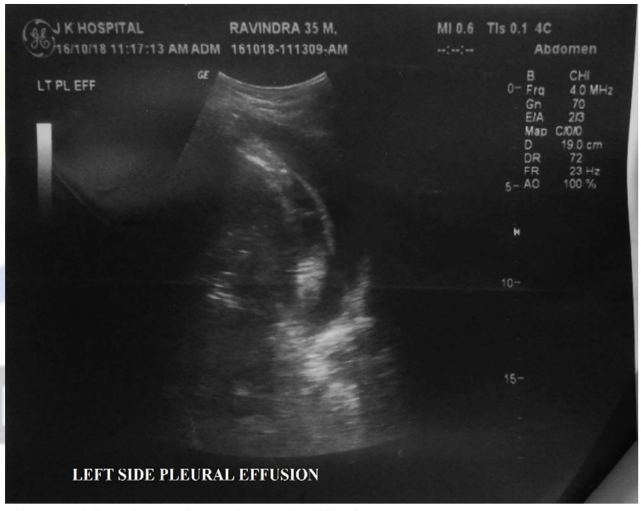

Figure 11: Right side pleural Effusion

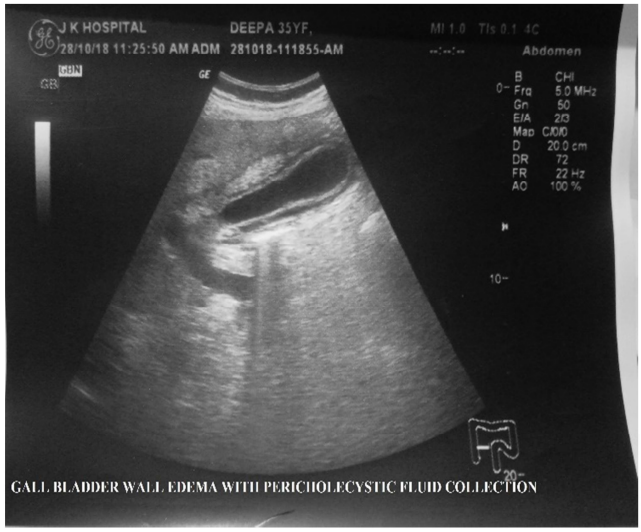

Figure 12: Gall Bladder wall Edema with pericholecystic fluid collection

Figure 13: Right side Pleural Effusion

Figure 14: Right side pleural effusion with gall bladder wall edema

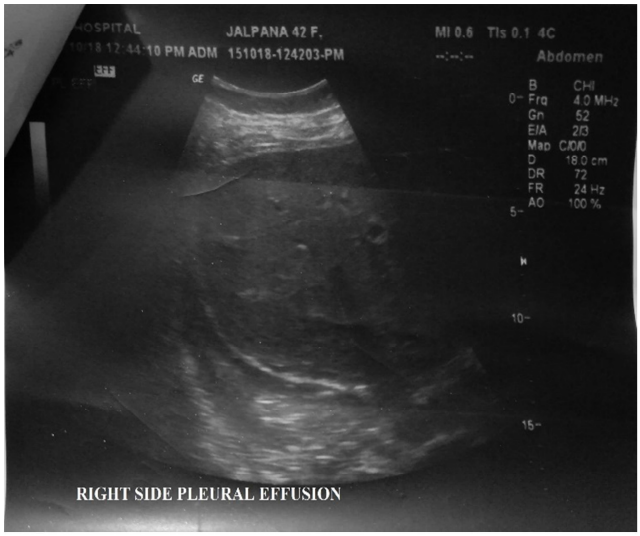

Figure 15: Right side Pleural Effusion

Figure 16: Right side Pleural Effusion

Figure 17: Right side pleural effusion with gall Bladder wall edema

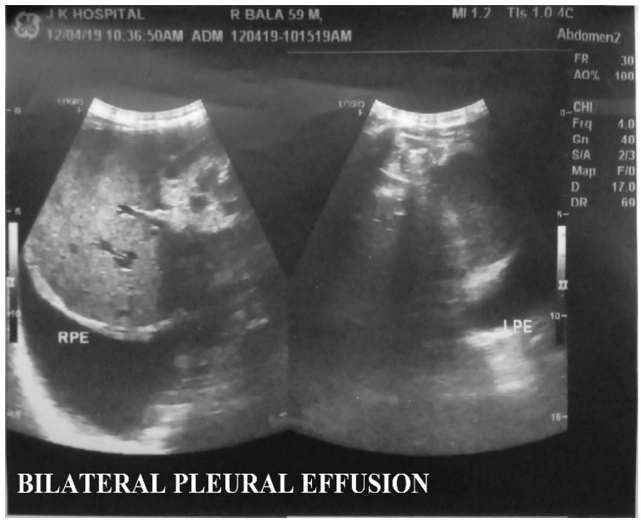

Figure 18: Bilateral Pleural Effusion

Figure 19: Right side pleural effusion

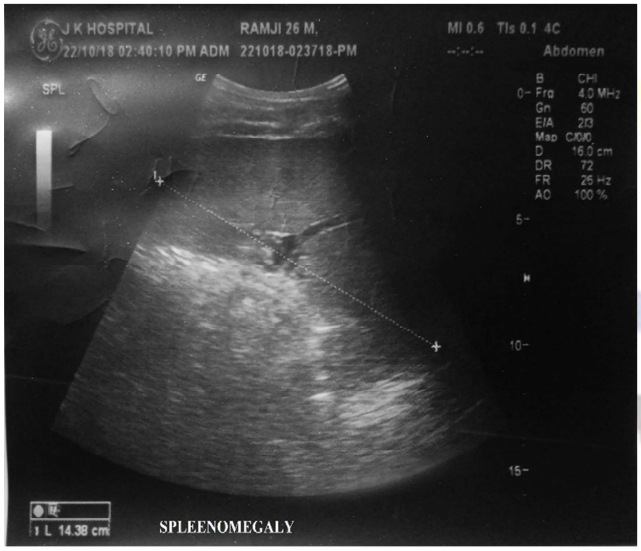

Figure 20: Spleenomegaly

Figure 21: Spleenomegaly

Figure 22: Spleenomegaly

Figure 23: Mild Spleenomegaly

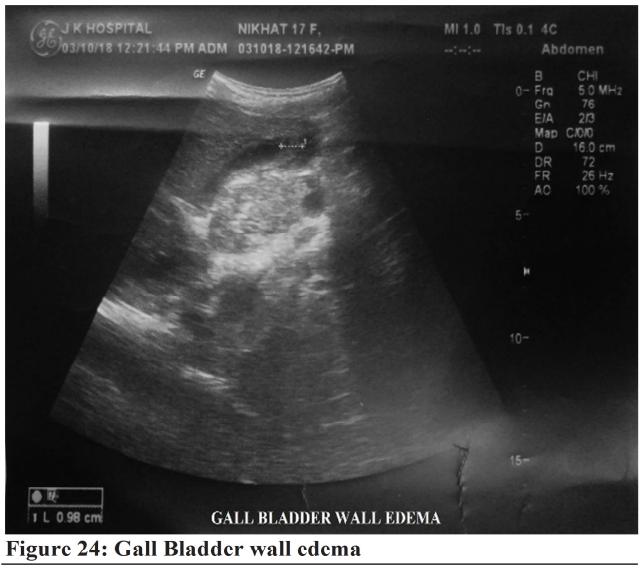

Figure 24: Gall Bladder wall edema

Discussion

Dengue is an acute febrile viral disease and a common health issue in tropical and subtropical countries including India. South East Asia and Western Pacific accounted for 70% of global incidence of DF with very high incidence reported from Indonesia, Thailand, Myanmar, Sri Lanka, Bangladesh and India.[1,3,13,14] Dengue fever is due to an arbovirus and if not diagnosed and treated in time than result's in life threatening situations.[2,9,10] Dengue fever is known since more than centuries affecting in South East Asia and Western Pacific regions. Estimated 50-100 millions population is annually affected in 100 endemic coutrics.[11] It has becomc a major intcrnational public health issue in recent years.[2,4] There are four serotypes of dengue virus namely DEN1, DEN2, DEN3 and DEN4 arbovirus belonging to Falviviridae family.[3.15] Virus is transmitted by Aedes aegypti mosquito from human to human with wide clinical presentation from asymptomatic to sever and life -threatening condition.[1,2,7,9]

It's reported about 50 million dengue cases occur every year with 5 Lakh cases of DSS and at least 12000 deaths per year.[10] The high incidence of DF is due to high growth of population, poor santitation ,global travel and poor control of vector borne diseases. Since 1963 more than 50 out breaks have been reported from India.[10] Dengue viruses are transitted to humans through the bites of infective female Aedes maosquito. Incubation period of DF is 3-14 days with sudden onset of high fever, retro-orbital pain, thrombocytopenia and haemorrahagic manifestations. Pancytopenia, neutropenia, increased haemoconcentration, thrombocytopenia and prolonged bleeding time are common findings seen in DF. The onset of DF is due to increased capillary permeability with leakage of albumin out of the vascular space results in effusion and collection of fluids-polyserositis.[9] Secondary hypotension usually occurs in 48 hours after defervescence.[5,9]

Serological test for DF is positive by 5-6 days of illness. The purpose of our study to corellate the findings of USG in DF in adjunt to clinical and serological findings in diagnosis and follow up the response.[9]

Usual presentation is as nonspecific onset of fever and with dengue hamorrhagic fever present with capillary extravasation this may leads to bleeding and results in shock- dengue shock syndrome (DSS) which may be fatal if not treated in time.[1,9,10]

More than 95% cases of DSS occurs in children <15 years of age and >_ 5 % of infants.[1,3,5] In our study also most of the cases(>80%) were in the age group of 11 years to 40 years with alomst same sex distribution. Similar findings have been found in the previous study.[5,8] There were few previously conducted studies for corelation of USG findings in DF reported GB wall thickening.[10] GB wall thickness more than 3 mm, pleural effusion and ascites in cases of DF. Santosh et al[8] reported that the USG findings of thickened GB wall, pleural effusion, ascites and hepatosplenomegaly should definitely support the diagnosis of DF in pateints presenting with fever and associated symptons particularly during an epidemic.[5]

Ultasonography of abdomen is useful for early diagnosis in dengue fever, although the USG findings are nonspecific.[2,4,6] In early mild form of DF there is GB wall thickening, pericholecystic fluid, minimal ascites, pleural effusion, pericardial effusion, hepatomegaly and splenomegaly. Thickened GB wall on USG was first reported as finding of DF by Pramuljo et al.[11] Subsequent studies were also consistent with GB wall thickening in DF. Venkata Sai et al,[10] reported this as most common initial USG findings. This was also consistent in our study.

The commonest USG finding in our study was GB wall thickening followed by ascites and pleural effusion.[9,12] Then splenomegaly and hepatomegaly. These USG findings were reported earlier also by.[2-6] Parmar J noticed a " Honeycomb pattern" of GB wall thickness.[2] In severe cases of DF, fluid collection seen in peri and para renal, hepatic and splenic sub capsular region., hepatomegaly and splenomegaly. These findings were earlier documented.[2,9,10] Joshi et al reported change in echotexture of liver due to intraparenchymal and subcapsular haemorrhages.[10] Such findings were not seen in our series. Gb wall thickening and oedma was the initial to be seen on USG may be due to decrease intravascular osmotic pressure. Subsequently pleual effusion and asites. These USG findings can occur in other viral infections, entric fever and leptospirosis. As all our cases were seroposative for DF. Therefore the possibility of other conditions casuing these USG findings were ruled out. DF has catastrophic effects in pregnancy with oligohydydramnioous and intra uterine demise.[5] USG Abdoman is valuable investigation in cases of DF, as its easy availability, low cost and repeatable even at bed side and without use of any radiation. Particularly during an outbreak of DF, GB wall thicking / oedematos with or without polyserosities in cases of fever should suggest possibility of DF/ DHF.

Conclusion

GB wall thickening /edema, ascitis, pleural effusion - Uni/Bilateral, hepatopslenomegaly are important sonography findings in patients with features of fever and diagnosis of dengue. These imaging features are more consistently seen in the children and young adults. These sonographic findings are helpful in monitoring the clinical status and response to the treatment.

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