DENGUE FEVER- ITS CLINICAL PROFILE, RADIOLOGICAL FINDINGS, HAEMATOLOGICAL AND BIOCHEMICAL PARAMETERS – STUDY FROM A TERTIARY CARE HOSPITAL

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ABSTRACT

BACKGROUND

Dengue is a rapidly progressing self-limiting systemic viral infection transmitted between humans by mosquitoes. About two-fifth of world's population, mostly those in tropical and sub-tropical countries are at a risk of dengue infection.

MATERIALS AND METHODS

A hospital-based cross-sectional descriptive study was conducted in Rajiv Gandhi Institute of Medical Sciences, Ongole. A total of 233 patients who were clinically diagnosed cases of Dengue with subsequent confirmation by Dengue NS1 Ag/ Dengue IgM were selected in the study. Data was collected using a semi-structured questionnaire, either by direct interview with patients or patient's relatives and by clinical examination and from relevant investigations.

RESULTS

Out of the 233 study population, majority (44.6%, n= 104) belonged to 40 - 59 years age group. Fever was the most common presenting symptom (99.6%) in the present study followed by myalgia in 60%, headache in 43.8%, joint pain in 35.6% and backache in 28.8%. Majority had low platelet count (68.2%). SGPT was altered in 65.2%, serum albumin in 33% and SGOT in 73.7% of the patients. 16.7% of patients had high random blood sugar level and 7.3% had high serum amylase levels. Dengue NS1 antigen was positive in 187 (80.3%) patients and 50 (21.5%) had dengue IgM positivity. The most common radiological finding in the present study was gall bladder wall oedema, which constituted 19.3% cases followed by ascites (9.4%), pleural effusion (9.5%), free fluid in Morrison pouch/ pelvis (2.6%) and pancreatitis (2.6%).

CONCLUSION

Ultrasonographic features like gall bladder wall oedema, pleural effusion and ascites should strongly favour diagnosis of dengue fever in a patient who presents with fever and thrombocytopenia, especially during an epidemic.

KEYWORDS

Dengue Fever, Clinical, Radiological, Haematological, Biochemical Parameters.

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BACKGROUND

Dengue is a rapidly progressing self-limiting systemic viral infection transmitted between humans by mosquitoes. Around two-fifth of world's population, mostly those in tropical and sub-tropical countries, are at a risk of dengue infection.^[1] Globally, about 390 million infections, of which 96 million symptomatic cases occur yearly.^[2] The region with the highest dengue incidence is in South East Asia, where cycles of epidemics occur every 3 - 5 years.^[3] About 1.8 billion of the population at risk for dengue worldwide live in South East Asia Region and Western Pacific Region. Of the 11 countries in South East Asia region, 10 are endemic for dengue and this includes India too. In India, unplanned urbanisation, migration of people from rural to urban areas with lack of proper sanitation are the main factors resulting in increased burden of dengue in recent times.^[4]

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Over the past 50 years global incidence of dengue has increased 30 times.^[5] In the past 2 decades, there has been a global increase in the frequency of dengue fever, dengue haemorrhagic fever and its epidemic due to rapid human population growth, uncontrolled urbanisation, inadequate waste and water management, and lack of effective mosquito control.^[6] About 85% of dengue infections are asymptomatic and rest 15% evolve to febrile illness, about 50,000 dengue cases progress to life-threatening disease causing 20,000 to 25,000 deaths annually.^[7] The acute illness experienced by dengue patients even though of short duration and not always life-threatening could have an important impact on daily activities, social function and emotional well-being.^[8]

In India, the disease is now epidemic in the entire country. As per the national programme, a total of 74,201 cases of dengue and 167 deaths in 2013 were reported. In 2015, Delhi, India, recorded its worst outbreak since 2006 with over 15,000 cases. The magnitude of the problem is much high, as the estimates are only on the reported cases.^[9,10]

According to National Vector-Borne Disease Control Programme, total dengue cases in India were 1,29,166 in 2016 and 1,57,220 in 2017. Total deaths in India were 245 and 250 in 2016 and 2017 respectively. In Andhra Pradesh, total cases were 3,417 in 2016 and 4,776 in 2017.

The present study has been done with an objective to determine the clinical profile among patients diagnosed with dengue fever and to assess the radiological findings, haematological and biochemical parameters from a tertiary care hospital.

MATERIALS AND METHODS

Study Design

Hospital-based cross-sectional study.

Study Setting

Rajiv Gandhi Institute of Medical Sciences, Ongole.

Study Period

January 2016 to December 2017.

Study Subjects

Include all adult patients aged 14 years and above who were admitted in medical wards of the Department of Medicine.

Inclusion Criteria

Clinically diagnosed cases of Dengue with subsequent confirmation by Dengue NS1 Ag/ Dengue IgM.

Sample Size and Sampling Technique

A total of 233 patients were selected for the study by consecutive sampling technique.

Study Procedure

The patients were selected as per inclusion criteria. An informed consent was taken. Detailed case history was taken, and relevant investigations were done for all patients at the time of admission itself.

Data was collected using a semi-structured questionnaire, either by direct interview with patients or patient's relatives and by clinical examination and from relevant investigations.

Investigations

- Complete haemogram.
- Biochemical parameters including liver function test, renal function test, serum amylase, urine routine examination.
- Serology- Dengue NS1 Ag and IgM ELISA dengue.
- Radiological investigations- Chest x-ray, USG abdomen, ECG, ECHO scan. Neuroimaging (CT/ MRI Brain) done in selected patients only.

Statistical Analysis

Statistical analysis was done using Microsoft Excel 2010 version. Descriptive statistics was carried out by mean and standard deviation for quantitative variables, frequency and proportion for categorical variables.

RESULTS

The mean age of the study population was 44.09 years with a standard deviation of 15.72 with majority (44.6%) subjects belonging to 40 - 59 years' age group. The proportion of males and females was 51.9% and 48.1% with a male-to-female ratio of 1.08: 1.

Majority of the subjects were admitted in the month of October (53.2%) followed by November (24.9%), September (13.7%) and December (6%).

The duration of admission ranged from 1 to 22 days with mean duration of 6.44 ± 2.87 days with maximum proportion of patients admitted for less than 10 days.

Fever was the most common presenting symptom (99.6%) in the present study followed by myalgia in 60%, headache in 43.8%, joint pain in 35.6% and backache in 28.8%. Other symptoms in decreasing order are vomiting in 27%, retro-orbital pain in 16%, pruritus in 14%, abdominal pain in 10.3%, cough in 8.6%, loose stool in 6.9%, rash in 6% and dysuria in 5% patients.

Among bleeding manifestations, menorrhagia (4%) was the most common followed by melena in 2.1%, haemoptysis in 1.7%, epistaxis in 1.3% and haematemesis in 0.9% of the study population.

Categories	Number	Percentage
Anaemia	54	23.2%
Low total leukocyte count	121	51.9%
Low platelet count	159	68.2%
High urea	04	1.7%
High creatinine	15	6.4%
Urine albumin +ve	08	3.4%
High SGPT	152	65.2%
Low S. albumin	77	33%
High SGOT	172	73.7%
High S. amylase	17	7.3%
High RBS	39	16.7%

Table 1. Summary of the Laboratory Parameters

Anaemia was seen in 23.2% of dengue fever patients in the study. Majority (51.9%) had TLC less than 4000. Majority had low platelet count (68.2%). Out of the 233 cases of dengue fever, 13.7% patients had a platelet count less than 29,000.

Blood urea and serum creatinine were high in 1.7% and 6.4% of the patients respectively.

Among the Liver function tests SGPT was altered in 65.2%, serum albumin in 33%, SGOT in 73.7% of the patients. 16.7% of patients had high random blood sugar level and 7.3% had high serum amylase levels.

Dengue NS1 antigen was positive in 187 (80.3%) of patients and 50 (21.5%) had dengue IgM positivity.

Figure 1. Bar Chart of Serology in Study Group

Categories	Number	Percentage
ECG Sinus Bradycardia	56	24%
Chest X-ray		
Left lower lobe consolidation	06	2.6%
Pleural effusion	06	2.6%
Echocardiogram		
Pericardial effusion	03	1.3%
Other Radiological Findings		
Gall bladder oedema	48	19.3%
Ascites	22	9.4%
Pleural effusion	22	9.4%
Free fluid Morrison pouch/ pelvis	06	2.6%
Pancreatitis	06	2.6%
Table 2. Radiological and Other Investigations		

In the present study, sinus bradycardia as an ECG finding was seen in 24% cases. Chest x-ray was normal in 221 (94.8%) patients, 6 (2.6%) patients each had left lower lobe consolidation and pleural effusion. Pericardial effusion on echocardiogram was seen in 1.3% patients.

The most common radiological finding in the present study was gall bladder wall oedema which constituted 19.3% cases followed by ascites (9.4%), pleural effusion (9.5%), free fluid in Morrison pouch/ pelvis (2.6%) and pancreatitis (2.6%).

DISCUSSION

In the present study of 233 patients of dengue fever, males were affected more than females. 121 were males and 112 were females, which constitute to 51.9% and 48.1% respectively and the ratio being 1.08: 1.

Study	Present Study	Mohan D Study ¹¹	Rachel Study ¹²	P M Venkata Sai Study ¹³	Patel PM Study ¹⁴	Singh R Study ¹⁵	Rashmi MV Study ¹⁶
Males	121	54	130	80	152	80	62
Females	112	46	120	48	98	60	38
Male: Female	1.08:1	1.17	1.08	1.67	1.55	1.33	1.63
Table 3. In Study of Dengue Fever Male-to-Female Ratio in Different Studies							

The results of Rachel Daniel^[12] was similar to present study. The patient's age ranged from 14 years to 90 years with mean age of 44.09 ± 15.72 yrs.

The maximum prevalence of dengue fever was noted in age group of 40 - 59 yrs. of about 44.6%. The least number were in > 80 years' age group with 1.3% accounting for it.

The duration of admission ranged from 1 to 22 days with mean duration of 6.44 ± 2.87 days.

The maximum number of patients got admitted in October (53.2%) followed by November (24.9%), September (13.7%), December (6%) in the present study, whereas the maximum number of admissions are in September (27.1%) in Singh R study^[15] followed by October (25%), November (20%) and August (19%).

Almost all patients in the study presented with fever. Other than fever, myalgia was the most common symptom in 60.9% followed by headache (43.8%), joint pain (35.6%), backache (28.8%), vomiting (27%), retro-orbital pain (16%), pruritus (14%), abdominal pain (10.3%), cough (8.6%), loose stool (6.9%), rash (6%) and dysuria (5%). Similar findings were seen in other studies- Mohan D Kashinkunti^[11] study, Rachel study,^[12] Singh R study^[15] and Ashwini Kumar study.^[17]

The bleeding manifestations constituted 10% of the present study, whereas 15.2% of cases in Rachel study,^[12] 21% in Mohan D study^[11] and 11.4% in Singh R study.^[15]

In present study patients with platelet counts > 1,50,000/cumm in 31.3%, 32.2% in 90,000 - 1,50,000/cumm, 15% in 60,000 - 89,000, 7.7% in 30,000 - 59,000/cumm, 13.7% in < 29,000/cumm.

Study	Present Study	Patel PM Study ¹⁴	Rachel Daniel Study ¹²	Singh R Study ¹⁵	Shaista Choudhary Study ¹⁸
< 1,00,000	39.5%	59%	90%	41.4%	90%
< 50,000	19.31%	-	47.4%	27.1%	60%
Table 4. Comparison of Platelet Count in Present Study with Other Studies					

The results of Singh R study^[15] is similar to present study.

Study	Present Study	Patel PM Study ¹⁴	Rachel Daniel Study ¹²	Singh R Study ¹⁵	Shaista Choudhary Study ¹⁸
SGPT	65.2%	40%	-	41.4%	64%
SGOT	73.7%	-	83.9%	80%	64%
S. albumin	33.05%	-	-	-	-
Table 5. Comparison of Alterations in Liver Function Test in Present Study with Other Studies					

The result of Patel PM study^[14] and Singh R study^[15] are similar to that of the present study.

Sinus bradycardia as an ECG finding constituted 25% cases in present study, whereas 15% in Rachel study.^[12]

Ultrasound Finding	Present Study	VR Santhosh Study ¹⁹	Venkata Sai Study ¹³	Singh R Study ¹⁵	Basawaraj NG Study ²⁰
Gall bladder wall oedema	19.3%	66.7%	100%	12.9%	92.8%
Ascites	9.4%	64.5%	-	38.6%	93.3%
Pleural effusion	9.4%	48%	6.25%	12.9%	29.5%
Hepatomegaly	-	17%	21.8%	43.6%	66%
Splenomegaly	-	16%	6.25%	30%	50%
Pancreatitis	2.6%	-	-	-	-
Free fluid in pelvis	2.6%	-	-	-	-
Table 6. Comparison of Ultrasound Findings in Present Study with Other Studies					

CONCLUSION

Strong possibility of dengue fever should be kept in mind in any patient presenting with fever, myalgia, joint pain, headache and backache. Ultrasonographic features like Gall bladder wall oedema, pleural effusion and ascites should strongly favour diagnosis of dengue fever in a patient who

presents with fever and thrombocytopenia, especially during an epidemic. It helps in making the diagnosis of dengue fever in patients awaiting their serological reports.

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