Original Research Article

A hospital based observational study on clinical profile of dengue fever in adult patients at tertiary care hospital, Chengalpattu District

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Abstract

Background: Dengue Fever, known commonly as Break bone fever is the most common Arboviral mosquito-borne disease in the world. This dengue virus is spread by the bite of infected Aedes mosquito, most commonly Aedes aegypti. Many countries especially the countries of the Indian subcontinent have suffered at the hands of this disease Dengue have a varied and wide spectrum of clinical presentations, often with unpredictable clinical evolution and outcome**.**
Aim and objectives: To study the clinical profile of serologically proven Dengue fever.
Materials and methods: The present study was an observational study where we studied the clinical profile of 225 serologically proven dengue patients admitted in the Department of Medicine. The study was conducted in the Karpaga Vinayaka Institute of Medical Sciences in the year 2017-2019. Complete physical examination and blood analysis were done for all cases.
Results: Distribution of dengue in females was slightly higher at 51.40% when compared to males 48.60%. In this study, all patients had fever 100%. Followed by headache 61%, Myalgia 54.60%, chills 46.20%, abdominal pain 43.40%, vomiting 42.20%. The characteristic feature of dengue-like bone pain and retro-orbital pain was present in only 3.20% and 32.70% respectively. An atypical clinical feature like a seizure was present in 1.20%. Most common sign observed in this study was conjunctival congestion 23.90%, followed by Hepatomegaly 12%, Ascites 10%, Rashes 10%, Pleural effusion 9.60%, Puffiness of the face and Splenomegaly 8.40%. The most common bleeding

manifestation encountered was Malena 27.50% followed by petechiae 8.40% and gum bleeding in 4.80% less frequent was bleeding manifestation hemoptysis 0.40%. BP is the most important clinical monitor in the case of dengue for identifying the onset of complications like shock. Pulse pressure is more important than BP in identifying early-stage shock. Narrowed pulse pressure (< 20 mm of Hg) is the most sensitive sign. 87 cases showed enzyme abnormalities in 100% cases with LFT abnormality which was similar to our study.

Conclusion: The most common clinical presentation of Dengue fever is fever with or without myalgia and presence of hepatosplenomegaly. It is more common in immediate post-monsoon months and affects young adult males more commonly. The most common laboratory abnormalities are of an increase in hematocrit, low total leucocyte count and low platelet count.

Key words

Dengue, Dengue Hemorrhagic Fever, Dengue Shock Syndrome, LFT.

Introduction

Dengue Fever, known commonly as Break bone fever is the most common Arboviral mosquito-borne disease in the world. Many countries especially the countries of the Indian subcontinent have suffered at the hands of this disease. Epidemiology of Dengue Fever in the Indian subcontinent is very complex [1]. It has changed over the last few years with regard to the strains, affected regions, and disease severity [2]. Dengue has a varied and wide spectrum of clinical presentations, often with unpredictable clinical evolution and outcome. Most of the patients will recover following a self-limiting, less severe clinical course, whereas a small proportion of patients with dengue infection, progress to severe disease, characterized by plasma leakage, with or without hemorrhagic manifestations [3]. Intravenous rehydration of the patient is the treatment of choice. By this simple intervention, the case fatality rate is reduced to less than 1% even in severe cases [4]. The clinical profile of dengue fever may vary with each epidemic because of the numerous strains available, varied possibilities of co-infections according to the geography and also due to the vector density of the particular area of the outbreak [5]. This study was an attempt to derive the clinical profile of Dengue infection from Chengalpattu district. An effort is also made to identify some peculiar clinical features that may help us to identify those seemingly simple cases that worsen without any warning signs, so that we may reduce the serious morbidity and mortality associated with this disease [6].

Materials and methods

The present study was an observational study where we studied the clinical profile of 251 serologically proven dengue patients admitted in the Department of Medicine. The study was conducted in the Karpaga Vinayaka Institute of Medical Sciences in the year 2019 with retrospective data collected from medical records department from December 2017 - December 2019. Complete physical examination and blood analysis were done for all cases.

Inclusion criteria: Fever with thrombocytopenia with Dengue antigen (NS1) or antibody (IgG or IgM) positivity, Adults with age for more than 13 years.

Exclusion criteria: Fever with thrombocytopenia due to other causes. Investigations: The following investigations were performed in all the patients. **Blood:** TC, Platelet Count, Hematocrit, LFT, RFT, Electrolytes, **Radiology:** chest X-ray, USG Abdomen.

Statistical analysis

The data was entered in the Microsoft Excel, spreadsheet and analyzed statistically using standard statistical software, SPSS for windows. Chi-Square test used for categorical variables.

Significance was considered if the p‘ value was below 0.05.

Results

Out of 251 cases, 149 patients (59.40%) belonged to DCF, DHF in 76 patients (30.30%), whereas 26 patients (10.40%) belonged to a more severe variety of DSS (**Table – 1**).

Table – 1: Clinical Spectrum of Cases.

Clinical spectrum of cases	No. of cases	Percent
DSS	26	10.4
DHF	80	30.3
DCF	149	59.4
Total	225	100

Table – 2: Distribution of Age.

Age (Years)	Frequency	Percent
< 20	101	40.2
20 - 29	77	30.7
30 - 39	27	10.8
40 - 49	22	8.8
50 - 59	19	7.6
> 60	5	2.0
Total	251	100

The majority of cases 40.20% occurred in young adults <20 years of age. The incidence appeared to reduce with advancing age with the least number of cases seen in the age group >60 years of age (**Table – 2**).

DCF (44.30%) and DSS (42.30%) was more common in the younger age group <20 years. DHF (39.50%) was more common in the age group of 20- 29 years whereas DSS is not observed in patients >60 years in this study. Distribution of dengue in females was slightly higher at 51.40% when compared to males 48.60% (**Table – 3**).

In this study all patients had fever 100%. Followed by headache 61%, Myalgia 54.60%, chills 46.20%, abdominal pain 43.40%, vomiting 42.20%. The characteristic feature of dengue-like bone pain and retro-orbital pain was present in only 3.20% and 32.70% respectively. An atypical clinical feature like a seizure was present in1.20% (**Table – 4**).

Even though the bone pain was present in 3.20% it has got a statistically significant correlation with Dengue classical fever (**Table – 5**).

Table – 3: Associations between Dengue type and age.

Age	Dengue Clinical Type		
	DSS	DHF	DCF
< 20 yrs	42.30%	31.60%	44.30%
20 - 29	26.90%	39.50%	26.80%
30 - 39	3.80%	13.20%	10.70%
40 - 49	15.40%	5.30%	9.40%
50 - 59	11.50%	6.60%	7.40%
> 60 yrs	-	3.90%	1.30%

Most common sign observed in this study was conjunctival congestion 23.90%, followed by Hepatomegaly 12%, Ascites 10%, Rashes 10%, Pleural effusion 9.60%, Puffiness of the face and Splenomegaly 8.40% (**Table – 6**).

Most common bleeding manifestation encountered was Malena 27.50% followed by petechiae 8.40% and gum bleeding in 4.80% less frequent was bleeding manifestation hemoptysis 0.40% (**Table – 7**). Malena has got a statistically significant association with DHF (**Table – 8**).

Blood pressure was normal in 76.50%, even though 21.50% of the patient presented with hypotension, DSS had occurred in 10.40% (**Table – 9**). CBC, thrombocytopenia was seen in 66.50%, leucopenia in 33.10% hematocrit

increased and decreased in 29.10% and 23.10% respectively (**Table – 10**). Increased hematocrit has got a statistical correlation with DSS (**Table – 11**). Serum bilirubin was elevated in 10.70%, whereas it was normal at 89.30% (**Table – 12**).

Table – 4: Analysis of symptoms.

Symptoms	Frequency	Percent
Fever	251	100
Chills	116	46.2
Headache	153	61.0
Retro-orbital Pain	82	32.7
Arthralgia	97	38.6
Bone Pain	8	3.2
Muscle Pain	137	54.6
Nausea	37	14.7
Vomiting	106	42.2
Sore Throat	38	15.1
Seizures	3	1.2
Abdominal Pain	109	43.4

Table – 5: Association between Dengue type and Bone Pain.

Bone Pain	Dengue Type			Total
	DSS	PDF	DCF	
Yes	3	1	4	8
	11.50%	1.30%	2.70%	3.20%
No	23	75	145	243
	88.50%	98.70%	97.30%	96.80%
Total	26	76	149	251
Chi Square: 6.861; P < 0.05				

In LFT, All the three enzymes ALT, AST and ALP were elevated in 47.10%.SGOT more than SGPT in 36.80%; SGPT more than SGOT; both AST and ALP were almost equally elevated in 5.70% whereas SGOT only in 2.30% (**Table – 13**).

The elevation of liver enzymes has no statistical correlation with any particular type of dengue (**Table – 14**). Renal function test was normal in 97.60%, elevated in 2.40% but it has no statistical correlation (**Table – 15**).

ECG was normal in 51.40%. The most frequent ECG sign was sinus Tachycardia 33.40%, whereas sinus bradycardia in 11.60%, First degrees AV block in 2.0%, Second degrees AV block 0.80% (**Table – 16**).

USG Abdomen was normal in 104 patients. GB wall edema was present in 23.90%, Ascites was present in 19.20%, and Pleural effusion was seen in 16.70%, Hepatomegaly15.50%, and Splenomegaly 15.10% (**Table – 17**).
In USG Right side Pleural Effusion was seen in 33.30% whereas bilateral effusion was more common and it was present in 66.70% (**Table – 18**).

X-ray chest P/A view was normal in 91.60%, here right-sided pleural was more common 5.20% when compared with bilateral pleural effusion 2.40% (**Table – 19**).

Table – 6: Analysis of clinical signs.

Signs	Frequency	Percent
Icterus	16	6.4
Pallor	13	5.2
Conjunctival Congestion	60	23.9
Hepatomegaly	30	12
Splenomegaly	21	8.4
Myocarditis	4	1.6
Pleural Effusion	24	9.6
Ascites	25	10.0
Encephalopathy	4	1.6
Rashes	25	10.0
Exfoliative Dermatitis	1	0.4
Diarrhea	16	6.4
Neck Stiffness	1	0.4
Puffiness of Face	21	8.4
Breathlessness	1	0.4
Pneumonia	4	1.6
Loss of Appetite	1	0.4
Pelvic Abscess	1	0.4
Herpes Labialis	1	0.4

Table – 7: Analysis of bleeding manifestation.

Bleeding	Frequency	Percent
Gum Bleeding	12	4.8
Epistaxis	9	3.6
Petechiae	21	8.4
Hemetemesis	5	2.0
Melena	69	27.5
Hematuria	4	1.6
Bleeding PR	2	0.8
Bleeding PV	9	3.6
Hemoptysis	1	0.4
Subconjunctival hemorrhage	14	5.6

Table – 8: Associations between Dengue type and Bleeding.

Melena	Dengue Type			Total
	DSS	DHF	DCF	
Yes	5	28	36	69
	19.20%	36.80%	24.20%	27.50%
No	21	48	113	182
	80.80%	63.20%	75.80%	72.50%
Total	26	76	149	251
Chi Square: 5.987; $P < 0.05$				

Table – 9: Analysis of blood pressure in dengue.

Blood Pressure	Frequency	Percent
Normal	192	76.5
Low	54	21.5
High	5	2.0
Total	251	100

Table – 10: Analysis of blood count.

CBC	Frequency	Percent
Leucopenia	83	33.1
Thrombocytopenia	167	66.5
HCT Increased	73	29.1
HCT Decreased	58	23.1

Table – 11: Associations between Dengue types and hematocrit.

Hematocrit	Dengue Type			Total
	DSS	DHF	DCF	
Normal	4	28	88	120
	15.40%	36.80%	59.10%	47.80%
Increased	10	20	43	73
	38.50%	26.30%	28.90%	29.10%
Decreased	12	28	18	58
	46.20%	36.80%	12.10%	23.10%
Total	26	76	149	251
Chi Square: 32.585; P < 0.001				

Table – 12: Analysis of Elevation of Bilirubin.

LFT: Bilirubin	Frequency	Percent
Elevated	27	10.7
Normal	224	89.3
Total	251	100

Table – 13: Analyses of Liver Enzymes.

LFT: Liver Enzymes	Frequency	Percent
Elevated SGOT, SGPT, Alk. Phosphate	41	47.1
SGOT > SGPT	32	36.8
SGPT = SGOT	5	5.7
SGPT > SGOT	7	8.0
SGOT Only	2	2.3
Total	87	100

CT brain was taken for 4 patients presented with encephalopathy. It was normal in 2 patients, 1 patient with Seizure had Intracerebral bleed (**Table – 20**).

In serology NSI antigen was positive in 61.80%, IgM in 44.60%, IgG in 1.60% (**Table – 21**).

Table – 14: Association of Dengue type and Liver Enzymes.

Liver Enzymes	Dengue Type			Total
	DSS	DHF	DCF	
Elevated SGOT, SGPT, Alk. Phosphatase	4	13	24	41
	57.10%	56.50%	42.10%	47.10%
SGOT > SGPT	2	10	20	32
	28.60%	43.50%	35.10%	36.80%
SGPT = SGOT	1	--	4	5
	14.30%	--	7.00%	5.70%
SGPT > SGOT	--	--	7	7
	--	--	12.30%	8.00%
SGOT Only	--	--	2	2
	--	--	3.50%	2.30%
Total	7	23	57	87
Chi Square: 8.445; P > 0.05				

Table – 15: Analysis of Renal function test.

	Frequency	Percent
Normal	245	97.6
Compromised	6	2.4
Total	251	100

Table – 16: Analysis of ECG.

ECG	Frequency	Percent
Sinus Bradycardia	29	11.6
Sinus Tachycardia	84	33.4
Brady with I degree AV Block	5	2.0
Brady with II degree AV Block	2	0.8
LVH	1	0.4
T Wave Inversion V1 to V4	1	0.4
Normal	129	51.4
Total	251	100

Table – 17: Analysis of USG.

USG	Frequency	Percent
Normal	104	41.4
Hepatomegaly	39	15.5
Splenomegaly	38	15.1
GB Wall Edema	60	23.9
Pleural Effusion	42	16.7
Ascites	48	19.2
Others	13	5.2

Regarding the Outcome, the patient‘s recovery rate achieved was 99.20%. We lost 2 cases (0.80%) among the 251 cases studied (**Table – 22**).

Table – 18: Analyses of USG Pleural effusion.

USG: Pleural Effusion	Frequency	Percent
Right Only	14	33.3
Bilateral	28	66.7
Total	42	100

Table – 19: Analysis of Chest X-Ray PA View.

Chest X-Ray P/A	Frequency	Percent
Normal	230	91.6
Right Pleural Effusion	13	5.2
Bilateral Pleural Effusion	6	2.4
Cardiomegaly	1	0.4
Right Lower Lobe Consolidation	1	0.4
Total	251	100

Table – 20: Analyses of CT Brain.

CT Brain	Frequency	Percent
Normal	2	50
Minimal White Matter Hypodensity	1	25
Intracerebral Bleed	1	25
Total	4	100

Table – 21: Analysis of Serology.

Serology	Frequency	Percent
NS 1	155	61.8
IgM	112	44.6
IgG	4	1.6

Table – 22: Analyses of Outcome.

Outcome	Frequency	Percent
Recovered	249	99.2
Dead	2	0.8
Total	251	100

Discussion

Physical examination in Dengue was done with utmost seriousness so that no critical signs that aid in prompt diagnosis of the disease and its complications was not missed. The signs were analyzed in detail in the present study. Conjunctival congestion due to dilatation of the superficial capillaries was the most common sign (23.90%) noted and was most striking too. If present, it was used as a sign for clinical suspicion of Dengue.

Rashes: Transient erythematous morbilliform rash (Exanthem) was associated with 10% of the cases (25 cases). The spectrum of rash varied from erythematous flush that blanched on the pressure to exfoliative dermatitis in 1 case. The rash was associated with itching in 11 cases.

Hepatomegaly and Splenomegaly: Clinically hepatomegaly was present in 30 cases (12%) and splenomegaly in 21 cases (8.40%). No significance was present in statistical analysis and hence these findings could not be specifically attributed to DCF, DHF, and DSS.

Ascites: Free fluid abdomen (ascites) was clinically apparent in 30 cases (10%) [7]. Ascites was a part of third space volume loss due to increased capillary leakage more during the later phase of the disease. However, ascitic fluid analysis was not attempted in these cases for proving the etiology and ascites reduced and disappeared with the clinical recovery of the patient. Ascites were observed in DCF, DHF, and DSS.

Pleural effusion: Clinically apparent pleural effusion was present in 24 cases (9.6%). Clinically right-sided pleural effusion was detected more frequently followed by bilateral pleural effusion. The pleural fluid analysis was not performed in these cases and hence could not be classified as exudative or transitive type [8]. With recovery from the disease, pleural effusion subsided and cleared completely.

Puffiness of face: A typical dengue facies resulted from facial puffiness especially eyelid edema associated with erythema of the surrounding areas. This kind of facial puffiness was present in 21 cases (8.4%).

Jaundice: 16 cases (6.4%) had icterus associated with dark yellow discoloration of urine. However, no features suggestive of obstruction of the biliary tree were noticed like clay-colored stool and pruritis. LFT was done, the details of which will be discussed in a later section.

Pneumonia: 4 cases of dengue also had developed pneumonia. This pneumonia would have been caused by either a co-infection or nosocomial infection [9].

Analysis of Bleeding Manifestations: Studying the bleeding manifestation among the cases admitted was undertaken separately. A detailed analysis of various bleeding manifestations is as follows.

Melena: 69 cases (27.50%) presented with melena. This was the most common bleeding manifestation encountered. DHF and melena were linked statistically with the significant p-value. The severity of melena ranged from mild to severe. Narrowed pulse pressure (< 20 mm of Hg) is the most sensitive sign [10]. In this study, hypotension was noted at presentation among 54 cases and the majority was stabilized using IV fluid support [11]. Hypotension was persistent in cases of DSS (26 cases). Eosinophilia was observed among many cases mostly in patients who had associated dermatological manifestations as rash and itching may be an effect of some allergic response [12]. Hematocrit was elevated in 73 cases studied and they had to be treated with IV fluid therapy in addition to oral fluids. Hematocrit was followed up every 6 hours and fluids were titrated accordingly. Hematocrit was persistently elevated in 27 cases where the duration of fluid therapy was extended to > 48 hours and even 72 hours to normalize the hematocrit [13]. WHO recommends fluid therapy only for 48 hours but we had to give IVF for an average of 72 hours according to hematocrit. This was a significant change in the fluid management strategy that we followed in this epidemic and was found to be more effective in treating our population with dengue. Further studies dealing with fluid therapy in our population with dengue is needed to validate our finding [14]. Low hematocrit was noticed among 58 cases but was significantly low in cases who presented with significant bleeding. However, a low hematocrit was also noted among the cases without bleeding manifestations. All three enzymes AST, ALT, and ALP were elevated in 41 cases (47.10%). AST was more elevated than ALT in 32 cases and in 5 cases both AST and ALT were elevated in almost the same proportion. ALT was elevated more than AST in 7 cases. Isolated elevation on AST was noticed only in 2 cases [15]. Normal recordings were seen in 169 cases. Sinus tachycardia was seen in 84 cases mostly due to fever itself and many of them in hypotension or shock and tachycardia seemed to resolve with normalization of BP. Sinus bradycardia was observed in 29 cases. First degree AV block was seen in 5cases and second degree in 2 cases. No case studied had a third-degree AV block. Compromised renal function was observed only in 6 cases out of the

251 cases studied [16]. They belonged to the age group < 20 years. However, this finding was not statistically significant. USG abdomen was essentially normal in 104 cases (41.40%) of the cases. Gall bladder wall edema was the most common USG finding (60 cases, 23.90% cases). Hepatomegaly and ascites were present in 39 cases and 48 cases respectively. Splenomegaly was observed in 38 % of cases [17]. Pleural effusion was detected in 42 cases (16.70%). Chest X-ray PA View was normal in 230 cases. Right-sided pleural effusion was detected in 13 cases and bilateral pleural effusion noted in 6 cases [18]. Cardiomegaly was noted only in 1 case. Consolidation was present in 1 case whereas pneumonitis with infiltration was reported in 3 cases. On comparing USG and X-ray in diagnosing pleural effusion, USG proved to be more sensitive than X-ray. Cases with even mild pleural effusion were picked up using USG whereas X-ray revealed the normal study. Bilateral pleural effusion was common in USG whereas right-sided pleural effusion was commonly reported in X-rays [19, 20].

Conclusion

Although these manifestations are rare, clinicians should always have a high index of suspicion and knowledge of these atypical manifestations, particularly in view of the increasing burden of dengue in recent years. Blood pressure and hematocrit should be monitored for evaluating the progress of the disease. The bleeding tendency should be closely watched. Management of patients with dengue is mainly supportive simple inexpensive and very effective in saving lives prophylactic FFP and platelets are not necessary for treating DHF, DSS, but early and meticulous monitoring are the cornerstone for a positive outcome.

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