

A Study of Clinical and Laboratory Profile of Dengue Fever in a Tertiary Care Hospital, Nizamabad, Telangana State, India

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ABSTRACT

Introduction Dengue is a mosquito-borne viral disease that has rapidly spread in all regions. The global incidence of dengue has grown dramatically in recent decades. About half of the world's population is now at risk. So the present study was done to analyse varied clinical and laboratory profile of confirmed Dengue IgM antibody positive adult patients admitted at Government General Hospital, Nizamabad.

Materials and Methods: Prospective observational study was undertaken among 150 adult IgM Dengue Antibody positive cases admitted. All Patients were evaluated clinically and subjected for relevant laboratory investigations and were followed up daily till they were discharged.

Results: In our study, male to female ratio was 1.67:1. Most common symptom followed by headache 115 (76.77%). Bleeding manifestations occurred in 29 (19.33%) patients, of whom malena 13 (44.82%) was the most frequent. Skin rash mainly maculopapular and diffuse flushing were noted in 44 (29.33%). The tourniquet test was positive in 28 (18.66%) patients. Isolated hepatomegaly and splenomegaly was found in 19 (12.66%) and 23 (15.33%) respectively. Ascites and plural effusion was found in 22 (14.66%) and 17 (11.33%) patients respectively. There were 21 (14.00%) cases of dengue with DHF / DSS. 25 (16.66%) had complications of which most common was hepatic dysfunction 17 (11.33%) followed by hypotension 11 (7.33%) and renal failure 7 (4.66%). Raised haematocrit (>45%) was found in 35 (23.33%) and leukopenia (<4000/cmm) was found in 58 (38.66%) patients. Thrombocytopenia was observed in all the patients with varying severity, severe (<20000/cmm) was observed. Raised Serum bilirubin (>2mg%) was observed in 17 (11.33%).

Conclusion: Younger age group commonly presented with classical dengue fever promptly responded to conservative therapy as a result of an early confirmation of diagnosis and early institution of therapy.

Keywords: Flavivirus, Dengue fever, Dengue Haemorrhagic Fever, Clinical Profile.

may result in a nonspecific febrile illness or may produce the symptom complex of classic dengue fever (DF). Classic dengue fever is marked by a rapid onset of high fever, headache, retro-orbital pain, diffuse body pain (both muscle and bone), weakness, vomiting, sore throat, altered taste sensation and a centrifugal maculopapular rash. The illness caused by DENV infection manifest either as classical dengue fever or severe dengue (Dengue Haemorrhagic fever/Dengue shock syndrome) which includes severe plasma leakage with severe haemorrhage and severe organ impairment.

Globally 2.5 - 3 Billion individuals lives in approximately 112 countries that experience dengue transmission. Annually, approximately 50-100 million individuals are infected. Currently close to 70% of global population exposed to dengue are in Asia Pacific region.⁵ In India the incidence has increased due to deficient water management, unplanned urbanization and migration of population to urban areas. Although initially reported from urban areas, dengue is now being reported from urban and rural areas alike.

In India dengue virus was isolated for the first time in 1945, first evidence of occurrence of dengue fever was reported in 1956 from Vellore district of Tamil Nadu and the first dengue haemorrhagic fever outbreak occurred in Calcutta (WB) in 1963. Outbreaks are now reported quite frequently from different parts of our country. In last decades major outbreaks and deaths are occurred in Northern India (Haryana, Punjab, UP), Southern India (Andhra Pradesh, Tamil Nadu, Karnataka), Western India (Gujarat, Rajasthan) and Eastern India (West Bengal). The case fatality has increased to above 1% in last ten years.⁶ Dengue is endemic in 31 states/UTs. During 2013 about 74168 cases were reported with 168 deaths, the highest number of cases were reported from Punjab followed by Tamil Nadu, Gujarat, Kerala and Andhra Pradesh⁷

At present very few studies have been conducted in this part of our country. As also exact clinical and laboratory profile is important for diagnosis and successful management thus crucial for saving life, hence this study was undertaken to analyse varied clinical and laboratory profile of serologically confirmed

INTRODUCTION

Dengue fever is caused by Infection with one of the four serotypes of Dengue virus (DENV) which is an arthropod born single stranded RNA virus of genus Flavivirus.¹ It is comprised of four closely related but antigenically distinct serotypes, DENV1, DENV2, DENV3, and DENV4. Infection with one dengue serotype confers lifelong homotypic immunity to that serotype and a very brief period of partial heterotypic immunity to other serotypes, but a person can eventually be infected by all four serotypes.² All 4 serotypes have been isolated in India, DENV1, DENV2 serotypes are widespread.³ Dengue is transmitted by mosquitoes of the genus Aedes, principally Aedes aegypti. The seasonal transmission of dengue is common in monsoon and post monsoon period. Initially dengue infection may be asymptomatic (50-90%)⁴,

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(Dengue IgM antibody positive) adult patients admitted at Government General Hospital, Nizamabad during the period of August to December 2015.

MATERIAL AND METHODS

This hospital based prospective study was performed at Govt. General Hospital, Nizamabad (Tertiary Care Hospital) in Telangana State, over a period of 5 months from August - December 2015. 150 Adult IgM Dengue antibody positive cases were enrolled for this study who are admitted in hospital for treatment. Ethical clearance was obtained from institute and also informed consent was taken from patient.

Inclusion criteria

1. Patients of both sexes of age more than or equal to 12 years, who were willing for admissions and who were positive for Dengue IgM antibody by ELISA.

Exclusion criteria

1. Patients of less than 12 years of age, tested negative for dengue IgM antibody by ELISA or who were not willing for admission.

2. Patient with concomitant malaria, typhoid, leptospirosis. The diagnosis of dengue fever, dengue haemorrhagic fever and dengue shock syndrome was based on WHO criteria.

Dengue haemorrhagic fever (DHF) is defined as an acute febrile illness with minor, major bleeding, thrombocytopenia (platelet count <1lac/cmm), and evidence of plasma leakage documented by haemoconcentration (Haematocrit increased by at least one-fifth or decreased by the same amount after intravenous fluid therapy), plural or other effusions, or hypoalbuminaemia or hypoproteinaemia. Dengue Shock Syndrome (DSS) is defined as DHF with signs of circulatory failure, including narrow pulse pressure (20mm Hg), hypotension, or Frank shock.⁸

All patients were evaluated clinically by taking history and thorough physical examination. Laboratory investigation done were haemoglobin%, TLC, DLC, Platelet count, Haematocrit, Liver function test, Blood urea, serum creatinine, blood sugars, ECG, Chest X-ray and USG Abdomen. Blood counts were monitored periodically as and when required. Other differential diagnosis were excluded by appropriate tests. IgM dengue antibody was estimated using dengue IgM capture ELISA, a solid phase immunoassay based on an immunocapture principle. Data collected was analysed and compared with available studies.

STATISTICAL ANALYSIS

Statistical analysis was done with the data with the help of the descriptive statistics. SPSS version 21 was used for statistical analysis.

RESULTS

Total number of the patients were 150, of whom 94(62.66%) were male and 56 (37.33%) were female (Table-1).

150 Adult dengue IgM antibody positive dengue fever patients admitted to medical wards over 5 months period from August – December 2015 were selected for this study. Most of the dengue cases were admitted during the month of September to November indicating clustering of cases during monsoon and post-monsoon period.

Of total 150, 94 (62.66%) were male and 56 (37.33%) were

female, the maximum number of patients belong to the age group 21-40 years, 89 (59.33%) followed by 12-20 years, 33 (22%) (Table-1).

Clinical Features

The mean duration of the symptoms was 5 days. The average duration of stay of the patient in the hospital was 7-10 days.

Fever was documented in all 150 (100%) patients, the most common symptom followed by headache 115 (76.77%), myalgia 108 (72%), abdominal pain 63 (42%), vomiting 35 (23.33%), sore throat 32 (21.33%), Retro-orbital pain 30 (20%) and Pruritus 19 (12.66%) (Table-2). Bleeding manifestations occurred in 29 (19.33%) patients, of whom malena 13 (44.82%) was the most frequent followed by venae Puncture bleed 9 (31.03%), epistaxis 5 (17.24%) and gum bleeding 5 (17.24%). Petechiae 4 (13.79%), Ecchymosis 3 (10.34%), haematuria 3 (10.34%) and hematemesis 2 (6.89%) were less common (Table-2). Bleeding manifestations were more likely with lower platelet counts, 12 patients has more than one bleeding manifestations. Skin rash mainly maculopapular and diffuse flushing were noted in 44 (29.33%), Jaundice was observed in 14 (9.33%) and bradycardia (Heart rate <60/min) was noted in 17 (11.33%) (Table-2). Most of the patients have sinus bradycardia. Tourniquet test

Age (yrs)	Male	Female	Total	%
12-20	21	12	33	22
21-40	56	33	89	59.33
41-60	13	8	21	14
>60	4	3	7	4.66
Total	94(62.66%)	56(37.33%)	150	100

Table-1: Age and sex distribution(n = 150)

Clinical Features	No Of Patients (%)
Fever	150(100%)
Headache	115(76.77%)
Retro-Orbital Pain	30(20%)
Myalgia	108(72%)
Arthralgia	31(20.66%)
Nausea/Vomiting	35(23.33%)
Abdominal Pain	63(42%)
Diarrhoea	15(10%)
Coryza/Sore Throat	32(21.33%)
Breathlessness	15(10%)
Pruritus	19(12.66%)
Insomnia/Lethargy	9(6%)
Bleeding Manifestations:	29(19.33%)
Gum Bleeding	5(17.24%)
Epistaxis	5(17.24%)
Haemoptysis	1(3.44%)
Hematemesis	2(6.89%)
Malena	13(44.82%)
Haematuria	3(10.34%)
Venae Puncture Bleed	9(31.03%)
P/V Bleed	3(10.34%)
Petechiae	4(13.79%)
Ecchymosis	3(10.34%)
Skin Rash	44(29.33%)
Bradycardia	17(11.33%)
Jaundice	14(9.33%)
Positive Tourniquet Test	28(18.66%)

Table-2: Distribution of clinical features of dengue fever cases

was positive in 28 (18.66%) (Table-2), test was positive more commonly among young male patients. Isolated hepatomegaly and splenomegaly was found in 19 (12.66%) and 23 (15.33%) respectively while hepatosplenomegaly was found in 12 (8%). Ascites and Plural effusion was found in 22 (14.66%) and 17 (11.33%) patients respectively. While both pleural effusion and ascites were found in 7 (4.66%) patients, 10 (6.66%) patient had gall bladder oedema (Table-3).

There were 21 (14.00%) cases of dengue with DHF / DSS among 150 (100%) as per WHO case definition. 25 (16.66%) had complications of which most common was hepatic dysfunction 17 (11.33%) followed by hypotension 11 (7.33%) and renal failure 7 (4.66%) (Table-4), 14 patient had more than one complications.

Laboratory Parameters

Among haematological parameters, raised haematocrit (>45%) was found in 35 (23.33%) and leukopenia (<4000/cmm) was found in 58 (38.66%) patients. Thrombocytopenia was observed in all the patients with varying severity, severe (<20000/cmm) was observed in 23 (15.33%) patients while moderate (20000-50000/cmm) in 62 (41.33) patients (Table-2). Platelet count at presentation was <50000 in about 56.66% of the patients though it kept falling further during hospitalisation. Minimum platelet count noted was 9000/cmm. Among biochemical parameters, raised serum bilirubin (>2mg%) was observed in 17 (11.33%) while raised SGOT (>45 IU/L), raised SGPT (>45 IU/L) were observed in 61 (40.66%) and 42 (28%) respectively, 7 (4.66%) patients had raised serum creatinine (>1.5mg/dl) (Table-5).

All patients were managed conservatively with IV fluids, antibiotics and antipyretics. Platelet transfusion was reserved for patients with active bleeding or prophylactically at a count of <10000/cmm.

DISCUSSION

Dengue is emerging as a major health problem in India, regular outbreaks of dengue infection have been occurring throughout India with more number of deaths.

In our study, male to female ratio was 1.67:1, similar pattern of male preponderance was found in previous studies conducted by Seema Avasthi et al⁹; Karolie et al¹⁰ Malavige et al, Sri Lanka¹¹ and G Lepakshi et al.¹² Fever was the most common presentation (100%) which is in unison with most of the studies from India¹²⁻¹⁷ and South East Asia.¹⁸⁻²⁰ Headache was found in 76.77% of the patients which is similar to the most of the previous studies^{10,12,14,20}; however study conducted by Munde D et al¹⁷ showed lower incidence of 25%. Myalgia was noted in 72% of the patients which is comparable with previous studies conducted^{15,24}, however study conducted by Mohamed Murtuza Kauser et al¹⁴ showed lower incidence (32.87%). Abdominal pain was found in 63% of the patients which correlates with the previous studies^{10,20}; however Studies conducted by Ragini Singh et al²¹ and Munde et al¹⁷ showed slightly lower incidence of 3.6% and 15% respectively. In our study, 23.33% of the patients presented with vomiting comparable to 25% in study conducted by Munde et al¹⁷; however Rajesh Deshwal et al¹³ and Ragini Singh et al²¹ reported only 5.4% and 11.4% respectively. Sore-throat was noted in 21.33% of the patients in our study comparable to the studies of Ragini Singh et al²¹ (18.6%); however study done by G Lepakshi et al¹² has noticed

Criteria	No of Patients (%)
Hepatomegaly	19(12.66%)
Splenomegaly	23(15.33%)
Ascites	22(14.66%)
Pleural Effusion	17(11.33%)
Gall Bladder Oedema	10(6.66%)
Both Pleural effusion and ascites	07(4.66%)
Hepato splenomegaly	12(18%)

Table-3: Ultrasonography Findings in dengue fever cases

Complication	No of Patients (%)
Renal Failure	7(4.66%)
Hypotension	11(7.33%)
Cholecystitis	0(0.00%)
ARDS	0(0.00%)
Encephalopathy	0(0.00%)
Multi-Organ Failure	01(0.66%)
Pneumonia	03(2.00%)
Hepatic dysfunction (14 Patient had more than one complications)	17(11.33%)

Table-4: Complications of dengue fever cases

Laboratory Parameters	No of Patients(%)
Haematocrit > 45%	35(23.33%)
Leukopenia <4000/cmm	58(38.66%)
Platelet Count	
<20000/cmm	23(15.33%)
20000-50000/cmm	62(41.33%)
50000-1 lakh/cmm	42(28%)
1-1.5Lakh/cmm	23(15.33%)
Serum Bilirubin >2mg%	17(11.33%)
SGOT(>45IU/L)	61(40.66%)
SGPT(>45 IU/L)	42(28%)
Serum Creatinine >1.5mg/dl	7(4.66%)

Table-5: Laboratory parameters of dengue fever cases (n=150)

in 50% and Rachel Daniel et al²⁰ has noted in only 5.2% of the patient. Retro-orbital pain was noticed in 20% of the patients in present study comparable to Rajesh Deshwal et al¹³ (18.3%) and G Lepakshi et al¹⁵ (14%); however study done by Nandini Chatterjee et al²² had 90%. Pruritus was noticed in 12.66% similar to the previous studies^{13,21}; however Mohamed Murtuza Kauser et al¹⁴ has noticed in 2.73% only.

In present study bleeding manifestations occurred in 29 (19.33%) of whom malena was the most common symptom noticed in 44.82% of the patient, similar to the previous studies^{12,22}; however studies done by Mohamed Murtuza Kauser et al¹⁴ and Ashwin Kumar et al²³ has noticed only in 1.36 and 4.7% respectively, however our findings are in contrast to the findings of Horvath R et al²⁴ from Australia and Sharma et al²⁵ from India who had noticed in 63% and 69% respectively. Venaepuncture bleed was found in 31.03% comparable with G Lepakshi et al¹² (57.14%). Epistaxis was found in 17.24% similar to study G Lepakshi et al¹² (14.28%) and NP Singh et al²⁶ (14%); however studies of Mohamed Murtuza Kauser et al¹⁴ and Ashwin Kumar et al²³ has noticed in only 2.73% and 2.6%. In present study gum bleeding was found in 17.24% similar to Malavige et al¹¹ from SriLanka (17%); however study done by G Lepakshi et al¹¹ showed higher (33.33%) and study by Mohamed Murtuza

Kauser et al¹⁴ and Ashwin Kumar et al²³ showed lower 1.36% and 5.2% incidence respectively. Petechiae was found in 13.79% comparable to study done by Ashwin Kumar et al²³ (18%). Ecchymosis was found in 10.34%; however study done by Ashwin Kumar et al²³ showed 6.2%. Haematuria was noticed in 10.34%. Hematemesis was found in 6.87%; however study done by G Lepakshi et al¹² showed higher incidence (38.09%) and studies of Mohamed Murtuza Kauser et al¹⁴ and Ashwin Kumar et al²³ showed lower incidence of 2.05% and 3.00% respectively. Skin rash was found in 29.33% similar to previous studies^{13,25,28}; however studies done by Rajesh Deshwal et al¹³ showed 66% and Basavaraj Raju et al¹⁶ showed 69.5% however Ragini Singh et al²¹ showed 15% and Rachel Daniel et al²⁰ showed 13.2% only.

In our study jaundice was observed in 9.33%; however Ragini Singh et al²¹ noticed in 17.1%. Bradycardia was found in 11.33%; however Rachel Daniel et al²⁰ found in 16.8%. Tourniquet test was positive in 18.66% similar to study done by Rajesh Deshwal et al¹³ (16.5%) and Vanamali D R et al²⁷ (20%); however slightly higher in Nandini Chatterjee et al²² (31%) and Rachel Daniel et al²⁰ (33.7%).

In present study hepatomegaly was found in 12.66% comparable to the previous studies^{13,23,25} in India, Thailand^{28,29,30} and Australia²⁵, while splenomegaly was found in 15.32% comparable to Rajesh Deshwal et al¹³ (13.2%) and G Lepakshi et al¹² (18%). Combined hepatosplenomegaly was found in 12.8%.

In present study ascites was found in 14.66% similar to studies by Rajesh Deshwal et al¹³ (16.33%), Nandini Chatterjee et al²² (17.7%) and Rachel Daniel et al²⁰ (12%); however study conducted by Ragini Singh et al²¹, G Lepakshi et al¹², Sanjay Kumar Mandal et al¹⁵ noticed in 38.6%, 22% and 8.1% respectively. Pleural effusion was found in 11.33% similar to Mohamed Murtuza Kauser et al¹⁴ (13.69%) and Rachel Daniel et al²⁰ (13.2%); however studies done by G Lepakshi et al¹² (18.91%), Sanjay Kumar Mandal et al¹⁵ (18.9%), Rajesh Deshwal et al¹³ (20%) showed slightly higher incidence. Both ascites and Pleural effusion was noticed in 4.66%.

DHF/DSS found in 14% similar to Vanamali D R et al²⁷ (12.6%) and Sharma et al²⁵ (13.5%). The most common complication noticed was hepatic dysfunction found in 17(11, 33%)

Raised haematocrit(>45%) was found in 23.33% comparable to previous studies.^{12,13,15,20} Leukopenia (<4000/cmm) was noticed in 38.66% comparable to previous studies^{16,23,25}; however studies done by Munde et al¹⁷ and Ritu Karolis et al¹⁰ noticed in 50% and 89% respectively. Platelet Count <50000/cmm noticed in 56.66% similar to previous studies^{13,20}, however Munde et al¹⁷ found in 75% and Karolie et al¹⁰ found in 89%.

Raised bilirubin (>2mg/dl) was seen in 11.3%, Raised SGOT(>45 IU/L) was found in 40.66% comparable with previous study Vanamali D R et al²⁷; however Rajesh Deshwal et al¹³, Nandini Chatterjee et al²², Ragini Singh et al¹⁸ found in 88.54%, 72% and 50% respectively, similarly Ritu Karoli et al¹⁰ and Rachel Daniel et al²⁰ found in 92% and 83.9% respectively. Raised SGPT(>45IU/L) was found in 28% similar to the previous studies Vanamali D R et al²⁷ (23%). Raised serum creatinine(>1.5mg/dl) was found in 4.66% similar to Mohamed Murtuza Kauser et al¹⁴ (1.36%).

No deaths were present in our study which indicates prompt

diagnosis and early management, creating significant changes in prognosis.

CONCLUSION

The current outbreak of dengue fever was predominantly affecting the male younger age group people mostly a febrile illness with headache and myalgia, GIT Symptoms and mild to moderate bleeding tendencies. Proper confirmation of diagnosis, early institution of therapy lead to prompt response to conservative treatment with no fatality rate.

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