ORIGINAL RESEARCH

STUDY OF CLINICAL OUTCOME IN PATIENTS WITH DENGUE SYNDROME AT A TERTIARY HOSPITAL

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ABSTRACT
Background: Dengue fever is an acute febrile illness, approximately 0.3-14.9% develops severe manifestations that result in ICU admission, and 1-5% dies without early recognition and proper treatment. Present study was aimed to study clinical outcome in patients with dengue syndrome at a tertiary hospital.
Material and Methods: In present study was hospital based, observational study, conducted patients > 18 years age, had acute fever of < 10 days duration, had positive dengue serology (IgM antibodies/ NS-1) after at least 5 days of onset of fever. Treatment details were noted & final outcomes were analysed.
Results: In present study, 130 patients satisfying study criteria were included. Majority patients were from 31-40 years (29.23 %) followed by 41-50 years (24.62 %) & 19-30 years (21.54 %). Male patients (63.85 %) outnumbered female patients (36.15 %). Majority of patients had DF with warning sign (59.23 %), Dengue without warning sign (26.15 %) & Severe Dengue fever (DHF) (14.62 %). 23.85 % patients required hospitalization for > 6 days. Common clinical features in present study were fever (96.92 %), headache (83.85 %), myalgia (63.85 %), body pain (53.85 %), vomiting (43.08 %) & joint pain (33.08 %). As per dengue serology majority were NS 1 positive (75.38 %) as compared to NS1 positive + antibody (IgM) (24.62 %). In cases of severe Dengue fever (DHF) (n= 19) crystalloids (100 %), colloids (78.95 %), PRBC (57.89 %), platelets (73.68 %) & FFP (31.58 %). Most of patients discharged uneventfully (68.42 %) while 5 deaths (26.32 %) were noted. Overall mortality in present study was 5.38 %.
Conclusion: Severe dengue disease, platelet count less than 50000, systemic involvement were common findings among patients died during course of treatment.
Keywords: Severe dengue disease, platelet count < 50000, systemic involvement serological diagnosis.

INTRODUCTION

Dengue is a mosquito- borne infection found in tropical and subtropical regions around the world. According to World Health Organization (WHO), it is estimated that over 2.5 billion people (40% of the total world population), in urban areas of tropical countries, are at a risk of developing dengue infection.[1]

Dengue fever is an acute febrile illness with frontal headache, retro‑ocular pain, muscle pain, joint pain, and rash, even though other signs and symptoms could also be present (such as lymphadenopathy, petechiae, nausea, hepatomegaly, and different types of hemorrhagic manifestations).[2] In majority of patients, dengue is manifested as a mild self-limiting disease, however, some of the patients may also require critical clinical management in intensive care unit (ICU) and the progression to severe clinical manifestations is usually unpredictable.[3]

A small percentage of persons who have previously been infected by one dengue serotype develop bleeding and endothelial leak upon infection with another dengue serotype. This syndrome is termed dengue hemorrhagic fever (DHF).[4] Increase in the number of dengue cases over the past few years has been attributed to rapid unplanned urbanization, unchecked construction activities, poor sanitation facilities contributing fertile breeding areas as well as availability of diagnostic tools.[5] Approximately 0.3-14.9% develop severe manifestations that result in ICU admission, and 1-5% die without early recognition and proper treatment.[6] Present study was aimed to study clinical outcome in patients with dengue syndrome at a tertiary hospital.

MATERIAL AND METHODS

In present study was hospital based, observational study, conducted in Department of Medicine, Al Ameen Medical College, Vijayapur, India. Study duration was of 2 years (July 2018 to June 2019). Study was approved by institutional ethical committee.

Inclusion criteria

- Patients > 18 years age, had acute fever of < 10 days duration, had positive dengue serology (IgM antibodies/ NS-1) after at least 5 days of onset of fever.

Exclusion criteria

- Pre-existing chronic kidney, liver or heart disease
- Patients with History of hematological disorders
- Patients not giving consent
- IgG positive but IgM/NS1 negative
- Patients with platelet function disorders

Study was explained & a written informed consent was taken for participation. Demographic details such as age, gender, symptomatology, past medical history & examination findings were noted in case record proforma. Their relevant laboratory investigations, including hemogram, urine analysis, LFT, KFT, RBS, Widal test, blood group and if needed, blood culture, X-ray chest, ultrasonography, CT scan and CSF analysis were done. Clinical syndromes were classified as per WHO guidelines into:

1. DF with warning sign
2. Dengue without warning sign

3. Severe Dengue fever(DHF)

Treatment details were noted & final outcomes were analysed. Data was collected and compiled using Microsoft Excel, analysed using SPSS 23.0 version. Statistical analysis was done using descriptive statistics.

RESULTS

In present study, 130 patients satisfying study criteria were included. Majority patients were from 31-40 years (29.23 %) followed by 41-50 years (24.62 %) & 19-30 years (21.54 %). Male patients (63.85 %) outnumbered female patients (36.15 %). Majority of patients had DF with warning sign (59.23 %), Dengue without warning sign (26.15 %) & Severe Dengue fever (DHF) (14.62 %). 23.85 % patients required hospitalization for > 6 days.

Table-1: Epidemiological profile of dengue patients

Parameter Variables	No. of cases (n=130)	Percentage
Age distribution (in years)		
19-30	28	21.54%
31-40	38	29.23%
41-50	32	24.62%
51-60	19	14.62%
>60	13	10.00%
Gender		
Male	83	63.85%
Female	47	36.15%
Duration of hospitalization (in days)		
0-6	99	76.15%
>6	31	23.85%
Classification		
DF with warning sign	77	59.23%
Dengue without warning sign	34	26.15%
Severe Dengue fever(DHF)	19	14.62%

Common clinical features in present study were fever (96.92 %), headache (83.85 %), myalgia (63.85 %), body pain (53.85 %), vomiting (43.08 %) & joint pain (33.08 %). Less common clinical features were dry cough (23.85 %), nausea (20.77 %), abdominal pain (10.77 %), diarrhoea (8.46 %), retro‑orbital pain (5.38 %), burning micturition (3.08 %) & rashes (0.77 %).

Table 2: Clinical features of dengue‑positive cases

Clinical features	No. of cases (n=130)	Percentage
Fever	126	96.92%
Headache	109	83.85%
Myalgia	83	63.85%

Body pain	70	53.85%
Vomiting	56	43.08%
Joint pain	43	33.08%
Dry cough	31	23.85%
Nausea	27	20.77%
Abdominal pain	14	10.77%
Diarrheal	11	8.46%
Retro‑orbital pain	7	5.38%
Burning micturition	4	3.08%
Rashes	1	0.77%

In present study, as per dengue serology majority were NS 1 positive (75.38 %) as compared to NS1 positive + antibody (IgM) (24.62 %). In study cases, common hematological findings were mild anemia (34.62 %), moderate anemia (8.46 %), severe anemia (3.08 %), leukocytosis (>11000) (16.15 %), leukopenia (<4000) (12.31 %), PCV (Packed cell volume) < 38.5 (87.69 %), raised SGOT (> 250) (80 %), raised SGPT (> 250) (76.15 %), Platelet count 1-1.5 lakh (28.46 %), Platelet count 50000- 1 lakh (25.38 %) & Platelet count <50000 (9.23 %).

Table 3: Laboratory parameters

Dengue serology		No. of cases	Percentage
NS 1 Positive		98	75.38%
NS1 Positive + Antibody (IgM, IgG)		32	24.62%
Hb (Hemoglobin)	Normal	70	53.85%
	Mild Anemia	45	34.62%
	Moderate Anemia	11	8.46%
	Severe Anemia	4	3.08%
TLC (Total leukocyte count)	Leukocytosis (>11000)	21	16.15%
	4000-11000	93	71.54%
	Leukopenia (<4000)	16	12.31%
PCV (Packed cell volume)	>38.5	16	12.31%
	<38.5	114	87.69%
SGOT	50-250	26	20.00%
	>250	104	80.00%
SGPT	50-250	31	23.85%
	>250	99	76.15%
Platelet count	>1.5 lakh	48	36.92%
	1-1.5 lakh	37	28.46%
	50000- 1 lakh	33	25.38%
	<50000	12	9.23%

In present study, all patients received antipyretics. In patients of DF with warning sign (n= 77) 61.04 % patients received crystalloids. No deaths noted, while 3 patients (3.9 %) were discharged against medical advise, rest all recovered & discharged uneventfully (96.1 %).

In patient of dengue without warning sign (n= 34), 61.04 % patients received crystalloids (85.29 %), colloids (38.24 %), PRBC (32.35 %), platelets (38.24 %) & FFP (23.53 %). Majority patients discharged (88.24 %), while 2 patients took discharge against medical advise (5.88 %) & 2 Deaths (5.88 %) were noted.

In cases of severe Dengue fever (DHF) (n= 19) crystalloids (100 %), colloids (78.95 %), PRBC (57.89 %), platelets (73.68 %) & FFP (31.58 %). Most of patients discharged uneventfully (68.42 %) while 5 deaths (26.32 %) were noted. Overall mortality in present study was 5.38 %.

Table 4: Management and outcome of dengue cases in the study

Outcome	DF with warning sign (n= 77)	Dengue without warning sign (n= 34)	Severe Dengue fever (DHF) (n= 19)	Total (n=130)
Management				
Crystalloids	47 (61.04 %)	29 (85.29 %)	19 (100 %)	95 (73.08 %)
Colloids	0	13 (38.24 %)	15 (78.95 %)	27 (20.77 %)
PRBC	0	11 (32.35 %)	11 (57.89 %)	22 (16.92 %)
Platelets	0	13 (38.24 %)	14 (73.68 %)	27 (20.77 %)
FFP	0	8 (23.53 %)	6 (31.58 %)	14 (10.77 %)
Outcome				
Discharged	74 (96.10 %)	30 (88.24 %)	13 (68.42 %)	117 (90 %)
Discharged against medical advise	3 (3.9 %)	2 (5.88 %)	1 (5.26 %)	6 (4.62 %)
Death	0	2 (5.88 %)	5 (26.32 %)	7 (5.38 %)

DISCUSSION

Dengue is one of the major causes of undifferentiated fever with diverse clinical presentation of DF in the same region even in the same period of time has been observed worldwide in the recent few years, where some recognized characteristics are still manifesting, and a small number of atypical characteristics are also noted. Dengue virus infection produces a spectrum of clinical illness ranging through undifferentiated fever, DF and self-limiting febrile illness associated with headache, myalgia and thrombocytopenia. DHF and dengue shock syndrome (DSS) are more serious and can be fatal.[6]

Rapid and accurate diagnosis of dengue in the acute phase of illness is important for initiation of therapy as well as for early enhancement of epidemic control measures especially in low endemic areas.[7] Diagnosis is done by detection of specific IgM antibody by ELISA which rise after 4-5 days of fever. Tests to detect NS1 antigen can also be performed but are less reliable.[8,9]

In study by Agrawal VK etal,[10] out of 334 patients, there were 186(55.6%) males with mean age 30.3±14.3 years, severe dengue was seen in 117(35%) and non-severe dengue in

217(65%). Clinical symptoms of diabetes, low platelet count (<50,000mm3), melena, skin rash, delayed admission (>5days after onset) elevated haematocrit, lymphadenopathy, hepatomegaly, splenomegaly, convulsions and mortality were significantly associated with severe dengue. After multivariate analysis, diabetes (<0.0001), elevated haematocrit (<0.0001), skin rashes (<0.0001), melena (<0.0001), low platelet count (<0.0001), lymphadenopathy (<0.0001) and delayed admission (<0.0001) were significantly associated with severe dengue disease

In study by Thaher MA etal,[11] out of 80 seropositive dengue patients, 25% were female and 75% were male patients, 24% patients were <15 years of age, and 9% patients were above 45 years, while majority (67%) belonged to age group of 15–45 years, with the majority in that being students. Mean hospital duration stay was 4.76 ± 1.53 days; 45% of patients showed DF, 21% DHF stage me, 19% DHF stage II, 9% DHF stage III, and 6% DHF stage IV. All 45% patients of DF revealed platelet count more than 100,000; remaining 55% patients of DHF and DSS showed platelet count less than 100,000. All 85% patients up to DHF stage II were normotensive patients, while 15% patients belonging to DHF stages III and IV showed hypotensive condition.

Mishra S etal,[12] studied 350 lab confirmed adult dengue patients, majority were from age group of 18-45 years and males. Majority had length of stay of less than a week and as age increases the length of stay also increases (statistically significant). The nil case fatality and lesser number of mean days of symptoms before admission possibly indicate that early arrival of patients to hospital can lead to very low fatality rates. Further research required to find out the other predictors of length of stay.

Tiwari M etal,[13] studied 75 dengue patients with fever <1 week confirmed based on NS-1 antigen and/or IgM antibody positivity. Gender was not significantly associated with the outcomes. The duration of fever was significantly higher among those with ICU use (median: 6 versus 4 days; p=0.005), ventilator use (median: 5.5 versus 4.0 days; p=0.049] and blood transfusion (median: 6 versus 4 days; p=0.013). Dengue patients with co-morbidities (diabetes, hypertension, or chronic obstructive pulmonary disease) or co-infection had significantly higher odds of the outcomes. The platelet level was significantly lower while liver enzymes were significantly higher among those with the outcomes.

Padyana M etal,[14] studied 98 patients, majority (58.4%) belonged to 21–40 year age group. Hepatic (96.8%) followed by hematological (79.2%) involvement were the most common findings. CNS involvement observed among 27%. Survival to hospital discharge was 78.9%. Respiratory and gastrointestinal system involvement was associated with increased mortality. Acute respiratory distress syndrome (ARDS), acute kidney injury (AKI) and shock were the clinical syndromes associated with mortality. Serum lactate, aspartate transaminase (AST) and alanine transaminase (ALT) were significantly elevated among non survivors. Significant difference in sequential organ failure assessment (SOFA) and acute physiology and chronic health evaluation (APACHE) scores was also observed among survivors and non survivors.

The provision of adequate care to patients with suspected dengue in primary care settings requires effective clinical evaluation, laboratory testing, and qualified professionals who know how to recognize warning signs and give appropriate guidance to prevent expended dengue.[15]

Rapid urbanization, globalization, increasing population, poor solid waste, and water management have given rise to new habitats for mosquito breeding thereby increasing the number of cases and deaths.[16] As dengue infection is a vector-borne disease affecting mainly young adult population, vector control measures should be applied in work places and in schools with enhanced community participation and health education.

CONCLUSION

Severe dengue disease, platelet count less than 50000, systemic involvement were common findings among patients died during course of treatment. Constant seroepidemiological examination, early clinical suspicion and diagnosis with prompt management accompanied by preventive measures can prevent morbidity and the mortality associated with dengue.

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