Research Article

RESURGENCE OF DENGUE INFECTION IN A TERRITIARY CARE HOSPITAL IN SOUTH INDIA

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A R T I C L E I N F O	A B S T R A C T
	Objective: Dengue fever is one of the most common arboviral mediated outbreaks reported with increased prevalence year after year with considerable morbidity and mortality. This study was designed to assess the clinical and biochemical parameters of dengue fever patients. **Methods:** Prospective observational study was undertaken among adult patients in a territory hospital. Two hundred patients were studied and analysed. All patients who were NS1 antigen/IgM dengue positive were included in the study. Clinical features, haematological and biochemical parameters were noted. **Results**: Out of 200 patients admitted in Dr. PSIMS & RF, fever is the main constitutional symptom followed by headache, myalgias, pain abdomen, vomiting, rash and bleeding manifestations. About 92 patients presented with complications. Haematological and biochemical derangements were seen in about 80% of patients. **Conclusion:** Dengue disease continues to involve newer areas, newer population and is increasing in magnitude, epidemic after epidemic. Dengvaxia(R) is a live attenuated tetravalent vaccine that is currently under evaluation and the vector control measures are also inadequate. Though clinical studies have reported on dengue disease in India, but these are largely based on diagnosis made by kits of doubtful specificity and sensitivity. A lot more remains to be achieved for creating an impact.

INTRODUCTION

Dengue is a vector-borne disease that is a major public health threat globally. It is caused by the dengue virus (DENV, 1–4 serotypes), which is one of the most important arboviruses in tropical and subtropical regions. Since the mid-1990s, epidemics of dengue in India have become more frequent, especially in urban zones[1].

The epidemiology of dengue in India was first reported in Madras (now Chennai) in 1780, and the first outbreak occurred in Calcutta (now Kolkata) in 1963; subsequent outbreaks have been reported in different parts of India, cases has significantly increased in India since 2001. Dengue had been restricted to urban areas, but it has now spread to rural regions[2] [3].

The Expansion of dengue in India has been related to unplanned urbanization, changes in environmental factors, host–pathogen interactions and population immunological factors. Inadequate vector control measures have also created favourable conditions for dengue virus transmission and its mosquito vectors.

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Both Aedes aegypti and Aedes albopictus are the main competent vectors for dengue virus in India.

The number of dengue cases has increased 30-fold globally over the past five decades. Dengue is endemic in more than 100 countries and causes an estimated 50 million infections annually. Individuals infected with dengue exhibit a wide spectrum of clinical symptoms ranging from asymptomatic to severe clinical manifestations, such as dengue shock syndrome.

A dengue vaccine, Dengvaxia(R), has been registered in several countries. Dengvaxia(R) is a live attenuated tetravalent vaccine that is currently under evaluation in phase 3 clinical trials in Asia. Dengvaxia(R) has not yet been approved by the Ministry of Health and Family Welfare, Government of India, because more clinical trials are thought to be necessary.

The common signs and symptoms observed were fever, headache, myalgia, arthralgia and bleeding manifestations have also been observed.

The exact clinical profile is important for patient management and crucial for saving life. The present study is an attempt to describe the salient clinical as well as laboratory findings of serologically confirmed hospitalized cases of dengue fever during the study period.

MATERIALS AND METHODS

The study was undertaken as a hospital based descriptive study with prospective data collection. Two hundred patients with confirmed dengue fever admitted to tertiary care hospital during a period from June 2016 – January 2018 were selected for this study.

NS1Ag, IgM and IgG, dengue antibodies were estimated using Rapid strip test. The diagnosis of dengue fever, dengue hemorrhagic fever and dengue shock syndrome was based on the WHO criteria.

Only those patients were included in the study with classical features of dengue – fever with chills, body ache, headache, rash, bleeding manifestations and thrombocytopenia and had a positive strip test.

Patients who had malaria and enteric fever were excluded from the study. Detailed history and clinical examinations were done. A complete blood count, liver function tests, renal function tests, chest X-ray and USG abdomen were also done.

RESULTS

A total of 200 cases admitted to the hospital in June 2016 to Jan 2018 were statistically analysed. Most of dengue cases occurred during the month of July to October depicts the role of rainy season on clustering of cases.

Majority of the cases 60% were male and 40% were females. Maximum number of cases 68% was in the age group of 15 – 40 years.

As seen in table 1 fever was present in all cases and is the most common symptom followed by headache (80%), myalgia (77%), vomiting(50%), abdominal pain (28%), skin rash (30%); haemorrhagic manifestations (25%) included petechiae, ecchymosis, gum bleeding, haematuria, melena, hematemesis and epistaxis; conjunctival congestion (34%).

Complications have been found in 92 patients (46%) which include serositis, hypotension, dengue shock syndrome, renal failure, ARDS.

Other laboratory investigations were illustrated in table 3 and 120 patients (60%) showed haematocrit more than 40, 70 patients (35%) showed leucopenia, thrombocytopenia platelet count less than 1 lakh is seen in 140 patients (70%), SGOT>40 seen in 100 patients (50%), SGPT>40 seen in 44 patients (22%), deranged RFT seen in 16 patients (8%), hyperbilirubinemia seen in 42 patients (21%).

Out of 200 cases,144 patients (72%) were NS1Ag positive,20 patients (10%) were Ig M positive,20 patients (10%) were Ig G+ Ig M positive,16 patients(8%) were NS1Ag+Ig M +IgG positive.

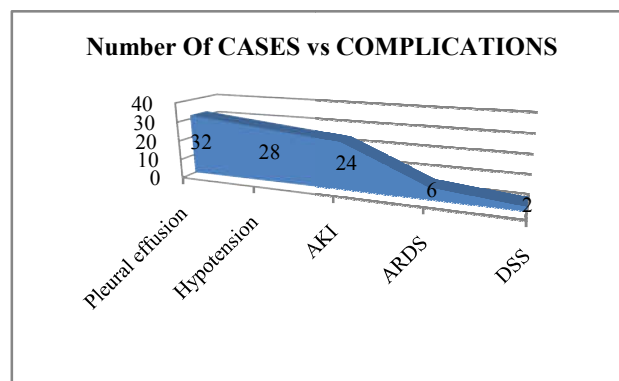**Table 1** Symptoms vs number of cases

Symptoms	Number of cases
Fever	200
Headache	160
Myalgias	154
Conjunctival congestion	68
Vomiting	60
Rash	60
Pain abdomen	56
Bleeding manifestations	50
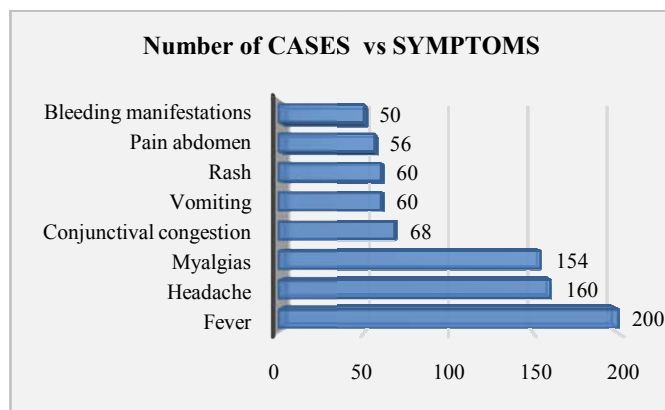
Graph 1 Number of Cases V/S Symptoms

Table 2 Complications Vs Cases

Complications	Number of cases
Pleural effusion	32
Hypotension	28
AKI	24
ARDS	6
DSS	2

Graph 2 Number of Cases V/S Complications

Table3 Number of Cases vs Lab Investigations

Lab investigations	Number of cases
Hematocrit(>40)	120
Leukopenia	70
Thrombocytopenia	140
SGOT(>40)	100
SGPT(>40)	44
Hyperbilirubinemia	42
Deranged RFT	16
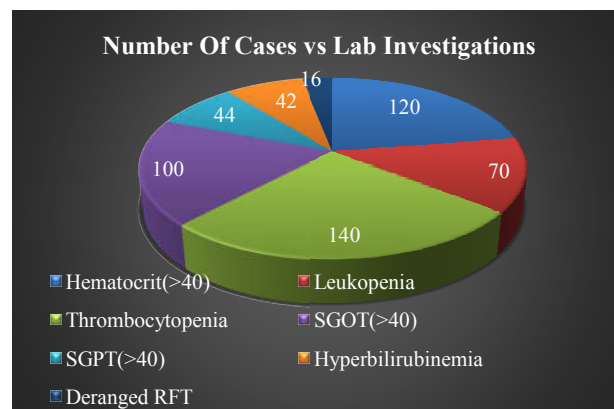
Graph 3 Number of Cases vs Lab Investigations

Table 4 Number of Cases vs Diagnosis

Diagnosis	Number of cases
NS1Ag positive	144
Ig M positive	20
Ig G+ Ig M positive	20
NS1Ag+IgM+Ig G positive	16

Number Of Cases vs Diagnosis
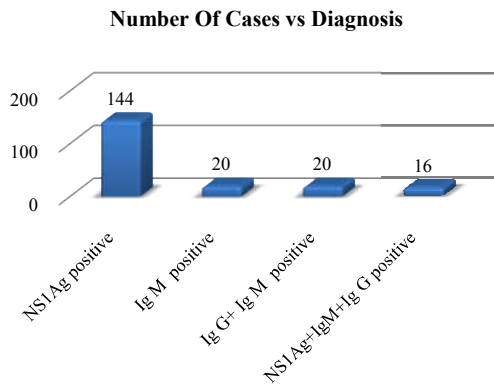
Graph 4 Number of Cases vs Diagnosis

Complications like large Gluteal hematoma due to IM injection in a patient of dengue with thrombocytopenia and severe post-operative bleeding in cystolithotripsy patient due to thrombocytopenia were also reported.

DISCUSSION

Dengue is a self-limited, systemic viral infection transmitted between humans by mosquitoes. The rapidly expanding global footprint of dengue is a public health challenge with an economic burden that is currently unmet by licensed vaccines, specific therapeutic agents, or efficient vector control strategies.

In the present study maximum number of patients was admitted in the rainy season (August to October) that is related to favourable conditions for growth of vector Aedes aegypti. Majority of cases were reported during monsoon & post monsoon seasons, in accordance with the reported patterns of dengue transmission. [4] The correlation between occurrence of dengue and monsoon is clearly evident in this study and previous studies conducted [5] [6].

In the present study maximum number of patients who suffered was in the age group between 15-40 years, our findings were related with Rajesh Deshwal *et al*[6]. maximum number of patients occurred in age group 15-40 years with male preponderance.[4] The male to female ratio is found to 1.7:1, in the study conducted by Ashwini Kumar *et al* ,where as another study showed slightly higher ratio of 2.67:1 [6]. Almost all the studies had male preponderance among affected individuals.

The clinical profile of dengue shows that fever was the most common presenting symptom in 200 (100%) patients. Abdominal symptoms/signs such as abdominal pain, nausea/vomiting, anorexia, abdominal tenderness were found to be present 38% of study population which shows identical result statistically where as another study was conducted by Satya Sudhish Nimmagadda which shows less number of patients are affected with abdominal symptoms [7].

Mavilla Anuradha *et al*, shows frequently affected symptoms in their study population are myalgia followed by headache, vomiting etc. which is reported similar frequency of all symptoms related to our study[8]

Bleeding manifestations were revealed in 25% of patients while Ashwini Kumar *et al*, reported in 26.6% and Tejashree. A *et al*, were reported in 3.84% of patients[9]

Conjunctival injection was found in 34% of patients where in other study it is about 39.4%

This study shows pleural effusion was found in 30% patients where other study displayed ARDS (33.33%) as a significant complication [4][5] but our study revealed that ARDS was found to be least. Other complications such as AKI   were observed in 20% patients in our study whereas other study shows 40.6% were effected with AKI[10] [11]. In our study, Hypotension was observed in 40 (20%) of patients but no death was found whereas other study was reported 3 deaths due to hypotension in seropositive patients [12] [13]

Increased haematocrit was observed in 60% of patients whereas Mavilla Anuradha *et al*, were reported in 30% of patients[14]. 140 (70%) patients had platelet count < 100000 cells/cumm but Rashmi K.S *et al* reported 72.77% of patients had platelet count < 100000 cells/cumm [15] [16]. Soor study reflected that more patients are encountered with thrombocytopenia. Leukopenia was observed in 35% of patients whereas Prafulla Dutta *et al*, were reported 30% of patients presented with Leukopenia[17] [18].

Liver enzymes like AST was found in 1/3rd of study population, Prafulla Dutta *et al*, also reported in 1/3rd of study population[17] and ALT were in 1/4th of study population whereas other study shows half of the patients[19][12]

The various factors were responsible for thrombocytopenia such as Platelet dysfunction, consumption coagulopathy and endothelial dysfunction which are not related to severity of bleeding. The patients were also investigated for other causes of fever endemic in our region such as malaria, typhoid and leptospirosis which causes the thrombocytopenia and often lead to delay in diagnosis of dengue. No death was found in our prospective study.

CONCLUSION

In conclusion, the results of this study show that out of 200 population, 144 new cases of NS1Ag positive were reported, 20 cases with IgG positive, 20 cases with IgM positive were reported; this indicates the resurgence of dengue in the background of NS1Ag positivity.

Complications have been found in 92 patients (46%) which include serositis (17%), hypotension (14%), AKI (12%), ARDS (3%), dengue shock syndrome (1%).

Dengue disease continues to involve newer areas, newer populations and is increasing in magnitude, epidemic after epidemic. In a bid to arrest the upsurge of dengue in India in recent times rather than to focus primarily on patient-centred, curative and medicine-intensive disease management, approaches to improve environmental health and to manage vector habitats should be prioritized.

Future Directions

The field of dengue research has been invigorated over the past decade, fuelled by the growing recognition of the burden of disease coupled with the prospect of a dengue vaccine.

However, no vaccine can be an immediate global panacea, and efforts to improve treatment through application of existing best practices in triage and fluid management, along with efforts to develop new antiviral or other therapeutic drugs, must continue.

Similarly, innovative approaches to preventing transmission of the virus, such as through modification of mosquito populations, should be fostered.

An improved understanding of the current epidemiology of the disease and the potential for its future spread would also assist policymakers in allocating resources to combat this global public health challenge.

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