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Original Research Article

Socio demographic and clinical profile of dengue fever cases at a tertiary care hospital, Hyderabad, Telangana

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ABSTRACT

Background: Dengue fever is caused by Dengue Virus, belonging to the family Flaviviridae, transmitted by Aedes aegypti and Aedes albopictus mosquito. There are four distinct dengue virus serotypes (DEN-1, DEN-2, DEN-3, and DEN-4). This viral disease of humans has become a major international public health concern in recent years. Differential diagnosis based on symptoms is challenging due to dengue's non-specific symptoms such as fever, aches and fatigue that are often overlap with other endemic infections. Dengue-associated mortality can be reduced from 20–30% in severe cases to less than 1% with appropriate fluid replacement and supportive care, which is greatly facilitated by early diagnosis. Aim and objective: To study the demographic factors and clinical features of dengue fever cases in urban areas of Hyderabad.
Methods: The present study was conducted by Department of Community Medicine in collaboration with Department of Microbiology, Kamineni academy of medical sciences and research center, Hyderabad. Study subjects: "Probable" dengue cases admitted in the various departments during July –December 2016. Data collection was done using a structured questionnaire. Serum samples were tested for NS1 antigen, IgM, IgG antibodies by rapid visual immunochromatography.
Results: Out of 137 samples of clinically suspected dengue cases, 119 were found positive for dengue infection. Fever was the most common symptom found in all the patients Majority of cases, 56.3% were males. Thrombocytopenia, leucopenia and bleeding manifestation were found in 84.0 %, 84.8% and 58.8% patients respectively.
Conclusions: Fever was the most common symptom found in all the patients. Majority of cases showed thrombocytopenia. Significant difference was found in the clinical signs and symptoms like fever, myalgia, hypotension, thrombocytopenia and leucopenia in dengue cases than controls.

Keywords: Clinically suspected cases, NS1 antigen, ELISA, Thrombocytopenia, Leucopenia

INTRODUCTION

Dengue fever is caused by Dengue virus, belonging to the family flaviviridae, transmitted by *Aedes aegypti* and *Aedes albopictus* mosquito. There are four distinct dengue virus serotypes (DEN-1, DEN-2, DEN-3, DEN-4). This viral disease of humans has become a major international public health concern in recent years. Dengue fever may be self - limiting, asymptomatic or may result in undifferentiated febrile illness. Infection causes a wide range of symptoms, ranging from in-apparent disease or mild non-specific fever to more severe and potentially lethal dengue hemorrhagic fever (DHF) and dengue shock syndrome (DSS).[1] Dengue was

first reported by Benhamin Rush in 1780 and described it as 'break bone fever'. The first confirmed report of dengue infection in India dates back to 1940s, and since then more and more new states have been reporting the disease in epidemic proportions often inflicting heavy morbidity and mortality Kolkata in India was the first to witness the epidemic (1963), but many more regions from the country reported the same in different time frames, Visakhapatnam (1964), Vellore (1968), Ajmer (1969), Kanpur (1969), Jalore (1985), Chandigarh (2002), Mumbai (2004), Ludhiana (2007), New Delhi (1996, 2003, 2006, 2010), Chennai (2006-2008) and Kerala (2008).[2-5] Globally it has emerged as a serious life threatening public health burden.[6] It affects more than 2.5 billion people annually and 975 million belonging to tropical and subtropical countries in Southeast Asia, the Pacific and the Americas with Africa bearing the major brunt of the disease amounting to 900 million cases annually.[7-9] It is estimated that worldwide nearly 2.5 billion people continue to live at risk of contracting the infection while 50 million cases and 24,000 deaths tend to occur in 100 endemic countries. Risk of mortality in treated cases of DHF/DSS is 1% while mortality rate among untreated cases escalates to 20%.[10] Vaccine development is major challenge due to the fact that DHF/DSS is associated with secondary infection and that the ideal vaccine should induce robust immune response against all four serotypes.[11] Differential diagnosis based on symptoms is challenging due to dengue's non-specific symptoms such as fever, aches and fatigue that often overlap with other endemic infections. Dengue associated mortality can be reduced from 20–30% in severe cases to less than one percent with appropriate fluid replacement and supportive care, which is greatly facilitated by early diagnosis.[12-14] Controlling dengue infections is challenging because it requires not only effective control of vectors responsible for transmitting the virus but also accurate and rapid diagnosis. To date, accurate and timely diagnosis of early detection with DENV remains a problem for management of dengue infected patients in many parts of the world, especially in countries with limited resources. A classification scheme for DENV, put forth by the World Health Organization (WHO) in 2009, includes criteria for probable dengue and severe dengue.[15] Most DENV infections are either asymptomatic or mild and self-limited, but there are "warning signs" that may suggest which patients may progress to severe disease and require strict medical management. Severe dengue may manifest as significant plasma leakage, hemorrhagic complications, and/or severe organ impairment. So early recognition of DENV infection is imperative.[15] Compromising the sensitivity of the WHO classification scheme is the fact that patient age influences the type and severity of symptoms; Low et al found that fewer older adults reported symptoms of myalgia and arthralgia, as well as mucosal bleeding, which is one of the primary "warning signs".[16] Early diagnosis and management of cases plays a crucial role in preventing the severity as well as fatality of dengue cases.

Aim and objective

To study the demographic factors and clinical features of dengue fever cases in urban areas of Hyderabad.

METHODS

The present study was conducted by Department of Community Medicine in collaboration with Department of Microbiology, Kamineni academy of medical sciences and research centre, LB Nagar, Hyderabad.

Study subjects

"Probable" dengue cases admitted in the various departments during July –December 2016.

Study design

Hospital based descriptive study

Study variables

Details of the study subjects were recorded using structural predesigned and pretested questionnaire. It includes Socio-demographic variables (age, sex, address) and clinical details, platelet count and lymphocyte count. Thrombocytopenia (Platelet count < 1,50,000 cells/mm^3), leucopenia (WBC <5000 cells/mm^3).Hypotension defined as systolic pressure <80 mmHg for those aged <5 years, 80 to 90 mmHg for older children and adults).

Data compilation and analysis

All the data collected was entered and analyzed with MS excel software 2007 and Epi info 3.5.3. All tests were considered significant at p <0.05 level

Inclusion criteria

Subjects with classical features of dengue –fever with chills, body ache, headache, rash, bleeding manifestation and thrombocytopenia (Platelet count <1,50,000 cells/mm^3) and with positive test result of any of the laboratory test (NS1 antigen and IgM &IgG antibodies positive for dengue)

Exclusion criteria

Patients who had malaria, Urinary tract infection, typhoid fever were excluded.

Ethical clearance

Taken from institutional ethical committee.

Consent

Study subjects were informed about the purpose of the study and have been explained in their language. Consent has been taken.

All the serum samples obtained from clinically suspected cases of dengue infection were tested in laboratory of Microbiology department for NS1 antigen, IgG and IgM antibodies by rapid visual immunochromatography based test (Dengue Day 1 test, J. Mitra & Co. Pvt, LTD. A 180-181, Okhla Ind. Area ph-1, New Delhi, India).

Limitations

Further follow up of the cases has not been done

RESULTS

Table 1 shows out of 137 samples of clinically suspected dengue cases, 119 were found positive for Dengue NS1 antigen, 78 were found to be positive by IgG and IgM was positive for 76 cases. Most commonly affected age group is 11- 40 years of age (68%). Majority of cases, 56.3% were males and 43.7 were females (Table 2).

Table 1: Results of samples tested by antigen NS1, IgG and IgM (n= 137).

Result of the test	NS1	IgG	IgM
Positive	119 (86.8)	78 (57.0)	89 (64.9)
Negative	18 (13.2)	59 (43.0)	48 (35.1)

Table 2: Age and sex wise distribution of the study subjects.

Age (in years)	Male	Female	Total (%)
1-10	3	8	11 (9.2)
11-20	13	13	26 (21.8)
21-30	19	10	29 (24.4)
31-40	15	11	26 (21.8)
41-50	8	6	14 (11.8)
>50	9	4	13 (10.9)
Total	67 (56.3)	52 (43.7)	119 (100)

Most of the cases have been reported during the periods of August – October.

Fever was the most common symptom found in all the patients followed by headache (83.1%), myalgia (77.3%), orbital pain (74.7%), bleeding manifestations (31.9%), like petechiae, malena, epistaxis and gum bleeding. Hypotension was found in 86.5% of the patients.

Thrombocytopenia, leucopenia and bleeding manifestation were found in 84.0%, 84.8% and 58.8% patients respectively (Table 3).

Table 4 significant higher difference was found in the patients who had fever, myalgia and hypotension (p<0.000) in dengue cases than controls. Thrombocytopenia and leucopenia was found statistically significant in dengue cases than controls (p <0.005).

Table 3: Clinical signs and symptoms of dengue fever.

Clinical manifestations (n=119)	No.	%
Fever	119	100
Headache	99	83.1
Myalgia	92	77.3
Abdominal pain	34	28.5
Breathlessness	36	30.2
Skin rash	51	42.8
Retro-orbital pain	89	74.7
Bleeding manifestation	38	31.9
Hypotension	103	86.5
Laboratory findings:		
Thrombocytopenia	100	84.0
Leucopenia	101	84.8

Table 4: Comparison of clinical features between dengue cases and controls.

Signs & symptoms	Dengue cases	Controls	p value
Fever ,myalgia, and hypotension	92	27	0.000
Thrombocytopenia	24	13	0.000
Headache	96	03	0.000

DISCUSSION

Out of 137 samples of clinically suspected dengue cases, 119 (86.9%) were found to be positive dengue cases by laboratory confirmed cases (positive by one or more of the following tests NS1, antigen, IgM, IgG antibody). Study conducted by Anand et al found 83.3% positive cases.[17]

In the present study commonly affected age group is 11-40 years of age (68%). Majority of cases, 56.3% were males and 43.7 were females. Tabassum, Dr. Sumana, Dr. Basavana, in their study found that there was more number of males in the age group of 15-35 years.[18]

Most of the cases have been reported during the periods of August – October. Most of the cases occurred during the month of June to September depicts the role of rainy season in the study conducted by Kashinkunti et al, Fever was the most common symptom found in all the patients followed by headache (83.1%), Myalgia (77.3%), retro-orbital pain (74.7%).[19] Hypotension was found in 86.5% of the patients. Thrombocytopenia, leucopenia and bleeding manifestation were found in 84.0 %, 84.8% and 58.8% patients respectively. Study conducted by Kashinkunti et al, found the most common presentation was fever 100 (100%), followed by headache (90%), myalgia (81%), vomiting (56%) and abdominal pain (48%).[19]

Significant higher difference was found in the patients who had fever, myalgia and hypotension (p <0.000) in dengue cases than controls. Study subjects who were

found to be negative for all NS1 antigen, IgM and IgG antibody were considered as controls. Thrombocytopenia and leucopenia were found statistically significant in dengue cases than controls ($p < 0.005$). A study shows persistent vomiting, hepatomegaly, platelet count <50.000 /mm^3, and leukocyte count ≥5000 /mm^3 at admission were associated with severe dengue infection in children.[20]

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Conflict of interest: None declared
Ethical approval: The study was approved by the Institutional Ethics Committee

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