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 inapparent 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 Benjamin 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). Globally it has emerged as a serious life threatening public health burden. It affects more than 2.5 billion people annually and 975 million belonging to tropical and subtropical countries in the New Asia, the Pacific and the Americas with Africa bearing the major brunt of the disease amounting to 900 million cases annually. 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%. 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. 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. 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. 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 severe organ impairment. So early recognition of DENV infection is imperative. 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”. 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/mm³). Leucocytopenia (WBC <5000 cells/mm³). 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/mm³) 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).

| 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   | 52     | 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 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|

**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%), orbital pain (74.7%).15 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 /mm³, and leukocyte count ≥5000 /mm³ at admission were associated with severe dengue infection in children.20

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REFERENCES

1. Whitehead SS, Blaney JE, Durbin AP, Murphy BR. Prospects for a dengue virus vaccine. Nat Rev Microbiol. 2007;5:518–28.
2. Dengue in Kerala: A critical review. ICMR Bulletin. 2006;36:13–22.
3. Garg A, Garg J, Rao YK, Upadhyay GC, Sakhuja S. Prevalence of dengue among clinically suspected febrile episodes at a teaching hospital in North India. J Infect Dis Immun. 2011;3(5):85-9.
4. Gunasekaran P, Kaveri K, Mohana S, Arunagiri K, Babu BV, Priya PP, et al. Dengue disease status in Chennai (2006-2008): A retrospective analysis. Indian J Med Res. 2011;133:322-5.
5. Anoop M, Isaac A, Mathew T, Philip S, Kareem NA, Unnikrishnan R, et al. Genetic characterization of dengue virus serotypes causing concurrent infection in an outbreak in Ernakulam, Kerala, South India. Indian J Exp Biol. 2010;48:849-57.
6. Shepard DS, Halsa YA, Tyagi BK, Adhish SV, Nandan D, Karthiga KS et al. Economic and disease burden of dengue illness in India. Am J Trop Med Hyg. 2014;91(6):1235-42
7. TDR/WHO. Dengue guidelines for diagnosis, treatment, prevention and control: new edition. TDR/WHO: Geneva, Switzerland. 2009.
8. Garg A, Garg J, Rao YK, Upadhyay GC, Sakhuja S. Prevalence of dengue among clinically suspected febrile episodes at a teaching hospital in North India. J Infect Dis Immun. 2011;3(5):85-9.
9. Low SL, Lam S, Wong WY, Teo D, Ng LC, Tan LK. Dengue seroprevalence of healthy adults in Singapore: serosurvey among blood donors. Am J Trop Med Hyg. 2015;93(1):40-5.
10. World health Organization. Dengue and dengue haemorrhagic fever. Fact Sheet.No. 117, 2002. Available at: http://www.who.int/mediacentre/factsheet/fs117/en/. Accessed on 7 March 2017.
11. Sim S, Hibberd ML. Genomic approaches for understanding dengue: insights from the virus, vector, and host. Genome Biol. 2016;17(1):38.
12. Kalayanarooj S. Standardized clinical management: evidence of reduction of dengue hemorrhagic fever case fatality rate in Thailand. Dengue Bull. 1999:23:10–7.
13. Lan NT, Hung NT, Ha DQ, Phuong BT, Lien LB. Treatment of dengue hemorrhagic fever at Children’s Hospital No. 1, Ho Chi Minh City, Vietnam, 1991-1995. Dengue Bull. 1998:22:99–106.
14. Kittigul L, Pitakarnjanakul P, Sujeeradat D, Siripanichgon K. The differences of clinical manifestations and laboratory findings in children and adults with dengue virus infection. J Clin Virol 2007;39:76–81.
15. World Health Organization, Dengue: Guidelines for Diagnosis, Treatment, Prevention and Control: New Edition, World Health Organization, Geneva, Switzerland, 2009.
16. Low JG, Ong A, Tan LK, Chaterji S, Chow A, Lim EY, et al. The early clinical features of dengue in adults: challenges for early clinical diagnosis. PLoS Negl Trop Dis. 2011;5(5):e1191.
17. Anand AM, Sistla S, Dhodapkar R, Hamide A, Biswal N, Badrinathsrinivasan. Evaluation of NS1 Antigen Detection for Early Diagnosis of Dengue in a Tertiary Hospital in Southern India. J Clin Diagnostic Res. 2016;10(4):DC01-4.
18. Begum TM, Sumana MN, Gowdappa BH. Evaluation of Rapid ICT in comparison with MAC-ELISA in diagnosis of dengue fever at a tertiary care hospital, South India. Int J Pharm Sci Invention. 2014;3(12):11-6.
19. Kashinkunti M, Shiddappa, Dhananjaya MA. Study of Clinical Profile of Dengue Fever in a Tertiary Care Teaching Hospital. Sch J App Med Sci. 2013;1(4):280-2.
20. Ledika MA, Setiabudi D, Dhamayanti M. Association between Clinical Profiles and Severe Dengue Infection in Children in Developing Country. Am J Epidemiol Infectious Disease. 2015;3(3):45-9.

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