Original Article

# A STUDY ON CLINICAL FEATURES AND COST INCURRED BY DENGUE SYNDROME PATIENTS ADMITTED TO A TERTIARY CARE HOSPITAL

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**Financial Support:** None declared

**Conflict of interest**: None declared



**How to cite this article**:
Chandra S, Ashwath Narayana DH, Manjunath M. A Study on Clinical Features and Cost Incurred by Dengue Syndrome Patients Admitted to a Tertiary Care Hospital. Natl J Community Med 2014: 5(3);293-5.

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**Date of Submission:** 28-02-14
**Date of Acceptance:** 24-05-14
**Date of Publication:** 30-9-14

## ABSTRACT

**Introduction:** Dengue infections are a significant cause of morbidity and mortality which leads to adverse economic effects in many developing tropical countries. The present study allows in better understanding of the clinical presentations and also helps in describing economic burden of the same. Objective of the study wasto describe the clinical features, case fatility and cost incurred of dengue syndrome admitted to tertiary care hospital.

**Methodology:**It was descriptive study done on patients admitted with clinical signs and symptoms of dengue during 2010-11 at KIMS Hospital & Research Center, Bangalore. The cost incurred by the patients in respect to hospital charges, laboratory investigations and drugs provided will be analyzed from the entries from the case records. These patients will be followed up through telephone contact provided in the case records.

**Results**: Out of 325 cases who had clinical signs and symptoms of dengue, 200 were found positive NS1 Ag/IgM/IgG for dengue. 62% among them were males. 35.5% were in the age group of 21-30 years. Majority (92.5%) had Classical Dengue followed by DHF (7%) and DSS (0.5%). Most common clinical symptom was fever (94%) followed by vomiting (45.5%) and abdominal pain (33%). Hemoglobin was >12gm% in 73.4% of cases. Case fatality was found to be 1.5%. Direct median cost was found to be Rs.12,611/- and indirect median cost was Rs.3109/-

**Conclusion:** Professionals and public should be made aware of common clinical manifestations of dengue syndrome for early reporting and seeking prompt treatment there by reducing the case fatality rate and the economic loss to the patients and country at large.

**Keywords:** dengue syndrome, direct cost, indirect cost

## INTRODUCTION

Dengue is a serious mosquito-borne viral disease which in recent years has become a major international public health concern. It is the most serious viral haemorrhagic fever in the world with an annual incidence of 100 million cases per year.[1]Dengue viruses cause symptomatic infections or asymptomatic seroconversion. It has a wide clinical spectrum that includes both severe and non-severe clinical manifestations.[2]

NS1 antigen is highly conserved glycoprotein that is present at high concentrations in the sera of dengue-infected patients during the early clinical phase of the disease. NS1 antigen is found from the first day and up to 9 days after onset of fever in blood sample of primary or secondary dengue infected patients.[5] Positive serology (anti dengue antibody) is the mainstay in the diagnosis of DF. Usually IgM does not become detectable until 5- 10 days[3,4] after the onset of illness in cases of primary dengue infection and until 4-5 days after onset of illness in secondary infections. In primary infections, IgG appear from 14th day and persist for life. Secondary infections show that IgG s rise 1-2 days after the onset of symptoms and induce IgM response after 20 days of infection.[5]

The need of this study is to know varied clinical presentations, estimating the economic burden due to the same in India where only few studies are available. The study may help in diagnosis the disease early and providing effective management of the patient with dengue infection and hence reducing the mortality rate. Objective of the study was to describe the clinical

features, case fatality and cost incurred of dengue syndrome admitted to tertiary care hospital.

## METHODOLOGY

It was a descriptive study done on patients admitted with signs and symptoms of dengue syndrome in KIMS Hospital & Research Center, Bangalore during 2010-11.

Out of 325 cases admitted with clinical signs and symptoms suggestive of dengue syndrome 200 (61.5%) cases were found positive for NS1 antigen\IgM\IgG positivity for dengue using SD BioLine kit. The medical records were perused for collecting data about these cases using a pre-designed proforma. Data was analyzed for the clinical presentations, direct cost incurred in respect to hospital charges and laboratory investigations. Cost of the drugs provided was analyzed from the entries from the case records. Information regarding the indirect cost (loss of daily wages of patients & attendants incurred) was collected through telephonic contact.

## RESULTS

Out of 325 suspect case of dengue 200 (61.5%) cases were found positive for NS1 antigen\ IgM\ IgG. Among 200 positive cases, males were 124 (62%) and females 76 (38%). 35.5% of the cases were in the age group of 21-30 years followed by 20.5% in 11-20 years. Median age group was 26 years; Range was 1-70 years (Table-1).

Majority 92.5% of cases presented as Classical dengue, 7% with dengue hemorrhagic fever and 0.5% with dengue shock syndrome (Table -3). 94% of cases had fever, 45.5% had vomiting and 33% had abdominal pain. 56.6% had moderate fever, associated chills and rigors in 51.3% of cases (Table- 2). Hemorrhagic manifestations were seen in about 4.5% of cases of which majority presented with haematemesis followed by epistaxis. Rashes were seen in 2% and joint pain in 13% of cases. Hepatomegaly was seen in 19%, splenomegaly in 10.5% and Pleural effusion in 5% of cases.

Hemoglobin level of > 12gm% was found in 73.4%, 9-12 gm% in 23.4%, 6-9gm% in 2.1% and < 6 gm% in 1.1% of cases. Platelet count of < 20,000 was found in 21.5% of cases, 20-50 thousand in 39.5% , 50,000 to 1.5 lakh in 36% of cases and >1.5 lakh was found in 3% of cases. Increased levels of Urea and Creatinine were found in 7.4% of cases.

Majority (58%) of cases were IgM & IgG positive, 16% were positive for IgG and 8% were positive for IgM, IgG& Ag (Table 5).

Transfusion was done in about 96 (48%) cases of which 95 (99%) received platelet transfusion (Average 3.24 units). 6 (6.3%) cases received fresh frozen plasma and 1 (1%) received whole blood transfusion in addition to platelet transfusion.

**Table 1: Age and sex wise distribution of cases**

| Age | Males (%) | Females (%) | Total |
|---|---|---|---|
| **1-10** | 9 (4.50) | 7 (3.50) | 16 (8.00) |
| **11-20** | 25 (12.50) | 16 (8.00) | 41 (20.50) |
| **21-30** | 52 (26.00) | 19 (9.50) | 71 (35.50) |
| **31-40** | 22 (11.00) | 14 (7.00) | 36 (18.00) |
| **41-50** | 9 (4.50) | 14 (7.00) | 23 (11.50) |
| **51-60** | 5 (2.50) | 6 (3.00) | 11 (5.50) |
| **61-70** | 2 (1.00) | - | 2 (1.00) |
| **Total** | 124 (62.00) | 76 (38.00) | 200 (100.00) |

**Table 2: Presenting complaints among patinets**

| Presenting Complaints | Number (%) |
|---|---|
| Fever | 188 (94) |
| Myalgia | 39 (19.5) |
| Hemorrhagic manifestations | 9 (4.5) |
| Vomiting | 91 (45.5) |
| Abdominal pain | 66 (33) |
| Headache | 53 (26.5) |
| Arthralgia | 11 (5.5) |
| Diarrhea | 21 (10.5) |
| Others | 32 (16) |

**Table 3: Presenting pattern of dengue cases**

| Dengue presentations | Male | Female | Total |
|---|---|---|---|
| Classical Dengue | 114 (57) | 71 (35.5) | 185 (92.5) |
| Dengue Hemorrhagic Fever | 9 (4.5) | 5 (2.5) | 14 (7.0) |
| Dengue Shock Syndrome | 1 (0.5) | 0 | 1 (0.5) |

Figure in parenthesis indicate percentage

**Table 4: Average cost incurred among dengue syndrome patients**

| Type of cost | Inclusion | Cost (INR) |
|---|---|---|
| **Direct** | Transportation of patient, diagnostic & laboratory investigations, medications, hospitalization & food | 12,611.00 |
| **Indirect** | Loss of wages of patient and attendants | 3,109.00 |
| **Other** | Treating co-morbid conditions | 2,275.00 |
| **Total Cost** | | **17,995.00** |

**Table 5: Laboratory confirmation of cases NS1 Ag/ IgM/ IgG positivity**

| Antigen/ antibody | Number (%) |
|---|---|
| IgM | 7 (3.5%) |
| IgG | 33 (16.5%) |
| Ag | 15 (7.5%) |
| IgM/IgG/ Ag | 15 (7.5%) |
| IgM/IgG | 116 (58%) |
| IgM/Ag | 11 (5.5%) |
| Ag/ IgG | 3 (1.5%) |

Case fatality rate (% of deaths among dengue syndrome patients) was found to be 1.5%. Previous history of dengue infection was seen in 4% of cases.

Cost incurred which includes direct median cost (transporting patient to the hospital, diagnostic testing and lab investigations, medications, hospitalization, food) was found to be Rs. 12,611=00. The indirect median cost (loss of wages of patient & attendants) was

found to be an average of Rs.3,109=00. The hidden cost (out of pocket expenses) was Rs.50=00. The cost of treatment of other co-morbid conditions was found to be Rs.2,275=00. The total cost of treating dengue syndrome was approximately Rs.17,995=00.(Table- 4)

## DISCUSSION

In the present study, it was found that males were commonly affected and most common age group was between 21-30 yrs of age which is similar to the findings by Deepinder Kaur Chhinaetal which was 21-30yrs.[6]

In the present study, the most common presenting symptoms was fever followed by vomiting and abdominal pain which is similar to study done by Kumar A et al showed fever in 99.2% followed by myalgia (64.6%), vomiting (47.6%), headache (47.6%) and abdominal pain (37.5%).[7]

In the present study, the most common bleeding manifestation was hematemesis and epistaxis similar to findings done by Aggarwal A et al[8] and Pushpa V et al[9]whereas during 2006 outbreak of dengue in North India, malena (50%) and hematemesis (38%) were the common bleeding manifestation.[10]

In the present study rashes were seen in 2% whereas study done by Ahmed FU et al[11] where rashes were found in 12% of children.

In the present study, Sera positivity rate of 58% for IgM and IgG and Hemoglobin > 12gm% was seen in 73.4% of cases which may be due to haemoconcentration.

In the present study, Case fatality rate was found to be 1.5% which is similar to findings of Ahmed et al[11] and Itha S etal.[12]

There is lack of data in our country on the cost incurred by dengue syndrome patients. However, in the present study, the total cost of treating dengue syndrome was approximately Rs. Rs.17,995=00 per patient was significantly higher for vast majority of patients who cannot afford to pay.

## CONCLUSION

The sero positivity for dengue was 61.5% with NS1 antigen\ IgM\ IgG. Males were commonly affected and 35.5% of the cases were in the age group of 21-30 years. Median age group was 26 years. Majority 92.5% of cases presented as Classical dengue, 7% with dengue hemorrhagic fever and 0.5% with dengue shock syndrome.

The estimated direct median cost was Rs. 12,611=00, indirect median cost was Rs.3,109=00, hidden cost was Rs.50=00 and cost of treating other co-morbid conditions was Rs.2,275=00. The total cost of treating dengue syndrome cases in tertiary care hospital was approximately Rs.17,995=00 per patient.

Professionals and public should be made aware of common clinical manifestations of dengue syndrome for early reporting and seeking prompt treatment there by reducing the case fatality rate and the economic loss to the patients and country at large.

**Acknowledgement:** Authors like to acknowledge Indian Council Medical Research for sponsoring the study**.** (STS- REFERENCE ID: 2011-03503)

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