# **Research Article**

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# Clinico-epidemiological profile of dengue fever cases admitted at tertiary care hospital, Rajkot, Gujarat, India

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# **ABSTRACT**

**Background:** Dengue fever (DF) and its severe forms - Dengue haemorrhagic fever (DHF) and Dengue shock syndrome (DSS) have emerged as a notable public health problem in recent decades in terms of the mortality and morbidity associated with it.

**Methods:** A cross-sectional prospective study was conducted at PDU Government Medical College, Rajkot during 1st January to 31st December, 2014. All confirmed Dengue cases were admitted in this institute during 2014 included in the study. The data entry was done in Microsoft Office Excel 2007 and analysis was done using the same software and appropriate tests were applied.

**Results:** This study included 145 patients who were admitted to the institute during the calendar year 2014. 62% were males. 69% were in the age group 15-44 yrs. 59% cases were from rural origin. During September to December, 2014, 80% cases were admitted. 74% cases were consulted by doctor before admission at PDU Government Medical College, Rajkot. Fever was present in all the cases i.e. (100%), followed by myalgia (99%), headache (96%), vomiting (78%) and epistaxis (63%). Majority of the cases presented with Classical Dengue fever i.e. (90%) followed by DHF (10%). Most common complication was bleeding from nose and mouth i.e. (66%). No any death due to Dengue was reported during study period. 93% cases were discharged and 7 % cases were DAMA from PDU Government Medical College, Rajkot.

**Conclusions:** The most common age group for Dengue fever was 15-44 yrs. Most of the patients were male and also from rural origin. Most of the cases occurred during the period of September to December, 2014. Fever was present in all the cases and bleeding from nose and mouth was the commonest complication of Dengue. No any death due to Dengue was reported during study period.

Keywords: Classical dengue fever, Dengue haemorrhagic fever, Tertiary care, Complications

# INTRODUCTION

Dengue is the most common disease among all the arthropod borne viral diseases. Dengue viruses (DV) belong to family Flaviviridae and there are four serotypes of the virus referred to as DV-1, DV-2, DV-3 and DV-4. Dengue Fever (DF) is caused by an arbovirus and spread by Aedes mosquitoes. Dengue is a self-limiting acute

mosquito transmitted disease characterized by fever, headache, muscle, joint pains, rash, nausea and vomiting.<sup>3</sup> These infections may be asymptomatic or may lead to (a) "classical" Dengue fever, or (b) Dengue Hemorrhagic fever without shock, or (c) Dengue hemorrhagic fever with shock.<sup>1</sup> Dengue fever (DF) and its severe forms - Dengue haemorrhagic fever (DHF) and Dengue shock syndrome (DSS) have emerged as a

notable public health problem in recent decades in terms of the mortality and morbidity associated with it.<sup>4</sup>

According to the World Health Organization (WHO), incidence of Dengue has shoot up 30 fold in the past 50 years. In fact, the problem has become hyper-endemic in many urban, peri-urban and rural areas, with frequent epidemics. Dengue and DHF is endemic in more than 100 countries in the WHO regions of Africa, the Americas, Eastern Mediterranean, South-East Asia and Western pacific. South-East Asia is one of the regions with highest risk of DF/DHF, accounting for 52% of the global risk. The case fatality rate in patients with Dengue hemorrhagic fever (DHF) and Dengue shock syndrome (DSS) can be as high as 40%.

In India, the risk of Dengue has shown an increase in recent years due to: (i) un-precedented human population growth; (ii) un-planned and un-controlled urbanization; (iii) inadequate waste management; (iv) water supply mismanagement; (v) increased distribution and densities of vector mosquitoes; (vi) lack of effective mosquito control has increased movement & spread of Dengue viruses and development of hyperendemicity and (vii) deterioration in public health infrastructure.<sup>3</sup>

In India, during 2013, about 74,168 cases were reported with 168 deaths. The fatality rate was 0.22 %. The highest numbers of cases were reported from Punjab followed by Tamil Nadu, Gujarat, Kerala and Andhra Pradesh. In Gujarat, during 2013, about 6,170 cases were reported with 15 deaths. During year 2013, about 370 cases were reported with 2 deaths in Rajkot district, 677 cases with 2 deaths in Rajkot Corporation and 1303 cases reported with 8 deaths at PDU Govt. Medical College, Rajkot. PDU Govt. Medical College, Rajkot is located centrally in Saurashtra region or Gujarat state and patients of surrounding districts are taking treatment at this institute.

The present study was carried out to know clinicoepidemiological profile of Dengue fever cases admitted at PDU Government Medical College, Rajkot during the calendar year 2014.

#### **METHODS**

A cross-sectional prospective study was conducted at PDU Government Medical College, Rajkot during the calendar year 2014. Suspected cases of Dengue were tested and confirmed for Dengue in the department of Microbiology. All confirmed Dengue cases admitted in this institute from 1<sup>st</sup> January, 2014 to 31<sup>st</sup> December, 2014 were included in this study.

The inclusion criteria for selection of cases were all those patients who gave oral consent for participating in the study and in case of children; interview of parents will be conducted to collect the data. The exclusion criteria for selection of cases were all those patients not willing to participate in the study and all those patients who were discharged before Dengue test confirmation report. Necessary approval of the Institutional Ethical Committee (human) was obtained prior to the beginning of the study.

A pre-tested semi-structured questionnaire was used for collection of data. At first the data was collected regarding Dengue confirmed cases from Microbiology Department of PDU Government Medical College, Rajkot then personal interview was conducted to collect information regarding clinico-epidemiological profile of Dengue fever cases admitted in this institute. All patients were visited daily for clinical condition and for other case details till discharge or death.

Data collected from the patients included demographic data like age, sex, religion, residence (rural/urban), clinical profile of Dengue patients, any coexisting conditions, complications and its outcome etc. The data entry was done in Microsoft Office Excel 2007 and analysis was done using the same software and appropriate tests were applied.

#### **RESULTS**

The present study was conducted among total of 145 confirmed Dengue fever cases admitted in PDU Government Medical College, Rajkot during Year 2014.

Table 1: Socio-demographic profile of Dengue patients (N=145).

Variable	Number	Percentage (%)		
Age group (In years	Age group (In years)			
<5 yrs	08	05.52		
5-14 yrs	24	16.55		
15-44 yrs	100	68.97		
45-60	08	05.52		
>60	05	03.45		
Sex				
Male	90	62.1		
Female	55	37.9		
Religion				
Hindu	122	84.14		
Muslim	23	15.86		
Residence				
Rural	86	59		
Urban	59	41		

 $\chi^2$  (Male: Female) = 8.448, df =1, p=0.004

Table 1 shows the socio-demographic profile of Dengue patients revealed that 100(69%) of 145 cases occurred in the age group 15-44 years. Mean age was 24.31 with range 3 months-70 yrs. Among 145 Dengue fever cases, 90(62.1%) were males while 55 (37.9%) were females. The difference between male and female cases was statistically highly significant ( $\chi^2$ = 8.448, df =1, p=0.004). 84.14% cases were Hindu. 59% patients from were rural areas.

Figure 1 shows that most of the cases occurred during the period of September to December 2014 i.e. 80% with peak in October (22%) and November (33%).

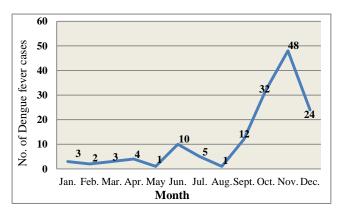


Figure 1: Month wise distribution of Dengue fever cases at PDU Govt. Medical College, Rajkot during Year 2014.

Table 2 revealed that 67(46%) cases consulted to AYUSH doctor, 30(20%) cases consulted to MBBS doctor and 37(25%) cases not consulted to any doctor before admission to these institute. 71 % rural cases consulted while 37 % urban cases consulted doctor before admission. The difference between doctor consulted and no doctor consulted among rural and urban cases was statistically significant.

Table 2: Dengue Fever cases according to type of doctor consultation before admission at PDU Govt.

Medical College, Rajkot.

Type of Doctor consult	Rural cases (N=86) n (%)	Urban cases (N=59) n (%)	Total (N=145) n (%)
Specialist	04 (04.65)	07 (11.86)	11 (07.59)
MBBS	20 (23.26)	10 (16.95)	30 (20.69)
AYUSH	47 (54.65)	20 (33.90)	67 (46.21)
No doctor consulted	15 (17.44)	22 (37.29)	37 (25.52)
Total	86 (100.0)	59 (100.0)	145 (100.0)

 $<sup>\</sup>chi^2$  (doctors consulted vs. no doctor consulted) = 7.252, df =1, p=0.007

Table 3: Dengue fever cases as per time interval between symptoms and admission.

Time interval (in days)	Rural cases (N=86) n (%)	Urban cases (N=59) n (%)	Total (N=145) n (%)
$\leq$ 3 days	42 (48.84)	27 (45.76)	69 (47.59)
4-5 days	28 (32.56)	25 (29.07)	53 (36.55)
> 5 days	16 (18.60)	07 (11.86)	23 (15.86)
Total	86 (100.0)	59 (100.0)	145 (100.0)
Mean	4.5	3.8	4.2
days			

Table 3 shows 69 (48%) cases were admitted at this institute within 3 days of symptoms, 53 (37%) cases admitted during  $4^{th}$  -5<sup>th</sup> days of symptoms and 23 (16%) cases admitted after more than 5 days of symptoms. Mean days of symptoms to admission at this institute was 4.2 days.

Table 4 revealed that fever was present in all the cases i.e.(100%), followed by myalgia (99%), headache (96%), vomiting (78%), epistaxis (63%), abdominal pain (19%), hematemesis (12%), decreased urine frequency (9%) and skin rashes (8%) as symptoms of Dengue respectively. Among 145 Dengue fever cases, 95 (65.52%) cases reported bleeding from nose and mouth, 16 (11.03%) cases reported hemetemesis, 9 (6.21%) cases reported pleural effusion, 4 (2.76%) reported ascites after admission.

Table 4: Dengue cases according to symptoms and complications (N=145).

Symptoms	Number	Percentage (%)
Fever	145	100.0
Myalgia/Arthralgia	143	98.62
Headache	139	95.86
Vomiting	113	77.93
Retro orbital pain	101	69.66
Epistaxis	92	63.45
Abdominal pain	28	19.31
Decreased urine frequency	13	08.97
Skin Rashes	12	08.28
Complications		
Bleeding from nose & mouth	95	65.52
Hemetemesis	16	11.03
Pleural effusion	09	06.21
Ascites	04	02.76
Melana	02	01.38
Neurological symptoms	02	01.38

Table 5: Mean haemoglobin and mean platelet count at different time (N=145).

Mean count	Mean Hb (gm%)	Mean platelet count (cells/cumm)
Mean on First day	10.69	88752
Mean of Lowest	9.7	68879
Mean at the time of discharge	11.2	113869

t test (lowest Hb vs. Hb on discharge) =14.316, df =144, p<0.01 t test (lowest Platelet Count vs. Platelet Count on discharge) =15.756, df =144, p<0.01

Table 5 shows that after admission at this institute, on the first day mean Haemoglobin was 10.69gm%. Mean lowest Haemoglobin while in hospital it was 9.7gm% and at the time of discharge it was 11.2gm%. As compared to first

day Haemoglobin of 10.69gm%, it reduced to i.e. 9.7gm%, that shows mean Haemoglobin reduced to 0.99gm% (9.26%). But at the time of discharge, it increased from mean of lowest Haemoglobin of 9.7gm% to 11.2gm%, showing increase in 15.46%. The difference of lowest Haemoglobin during admission and Haemoglobin at the time of discharge among rural and urban cases was statistically highly significant. After admission at this institute, mean platelet count on 1<sup>st</sup> day was 88752/cumm, lowest mean was 68879/cumm and at the time of discharge it was 113869/cumm. The difference of lowest platelet count and platelet count at the time of discharge among rural and urban cases was statistically highly significant.

Table 6 revealed that 91 (62.76%) of 145 cases improved and discharged. As high as 44 (30.34%) cases were discharged on requested (DOR) but 10 (6.9%) cases were discharged against medical advice (DAMA). No death due to Dengue fever reported.

Table 6: Dengue fever cases according to final outcome.

Final outcome	Rural area (N=86) n (%)	Urban area (N=59) n (%)	Total (N=145) n (%)
Discharge	55 (63.95)	36 (61.02)	91 (62.76)
Discharge on request(DOR)	28 (32.56)	16 (27.12)	44 (30.34)
Discharge against medical advice (DAMA)	03 (03.49)	07 (11.86)	10 (06.90)
Death	00 (00.00)	00 (00.00)	00 (00.00)
Total	86 (100.0)	59 (100.0)	145 (100.0)

#### **DISCUSSION**

Of the 145 cases admitted at PDU Govt. Medical College, Rajkot, large majority of cases i.e. 69% were in the age group of 15-44 years. These findings are similar to the study by Ashwini Kumar et al. in Karnataka and Saini et al. in Western Maharashtra, India. Similarly, study by Ahmed N et al. in Delhi, North India reported 70% cases in the age group 11 to 40 years. Male patients were more in this study which was similar to the study by Ashwini Kumar et al. in Karnataka but more compared to the study by Karoli et al. in North India. Most cases (80%) in this study admitted during September-December. Similarly 90% cases reported during July-December in the study of Kale AV et al. in Maharashtra, India. 14

In this study, number of DF cases (90%) were more but less DHF (10%) compared to study by Karoli et al. in North India in which DF (70%) and DHF (30%) cases. In this study, the commonest symptoms of DF was fever

(100%) which was similar to the study by Dr. Mohan D kushinkunti et al. and Ashwini Kumar et al. in Karnataka while headache was the commonest symptoms in the study by Karoli et al. in North India. 10,13,15 Most commonest complication in this study was bleeding from nose and mouth (65%) followed by hematemesis (11%) and pleural effusion (6%), while petechiae (67%) and ARDS (33%) was commonest complication in study by Ashwini Kumar et al. 10

After admission at this institute, on the first day mean Haemoglobin was 10.69gm%. Mean lowest Haemoglobin while in hospital it was 9.7gm% and at the time of discharge it was 11.2gm%. Mean platelet count on 1<sup>st</sup> day after admission was 88752/cumm, lowest mean was 68879/cumm and at the time of discharge it was 113869/cumm. The overall outcome of patient care was good, with 63% cases improved & discharged from PDU Govt. Medical College, Rajkot while 99.33% cases improved & discharged in a study of Kale AV et al.<sup>14</sup>

#### **CONCLUSION**

The most common age group for Dengue fever was 15-44 yrs. Male preponderance was seen. More rural patients were admitted as compared to urban areas. Large majority of cases were occurred during September-December. About one fifth cases were not consulted to any doctor after having symptoms of Dengue. 50% cases were admitted at PDU Govt. Medical College, Rajkot after 4 days of symptoms. Fever was present in all the cases and bleeding from nose and mouth was the commonest complication of Dengue. No any death due to Dengue was reported during study period. Among 145 cases, 93% cases were discharged but 7 % cases were Discharged again medical advice.

### Recommendations

Vector control measures, larva control measure and health education to the community should be strengthened during monsoon period. All suspected dengue cases should be encouraged to visit physician for early diagnosis and treatment. Tertiary care institute should be strengthening to manage complications efficiently and to prevent unnecessary mortality.

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#### REFERENCES

- Thongchroen P. Monography on Dengue/Dengue haemorrhagic fever, regional publication, WHO, SEARO no.22. 1993.
- 2. Gupta N, Srivastava S, Jain A. Dengue in India, Indian J Med Res. 2012; 136:373-90.
- Directorate General of Health Services. Guidelines for Clinical Management of Dengue Fever, Dengue Haemorrhagic and Dengue shock syndrome, Ministry of Health and Family Welfare, New Delhi. 2008:1-8.
- 4. World Health Organization. Dengue hemorrhagic fever: Diagnosis, Treatment, Prevention and Control. 2 ed. Geneva. 1997:12-3.
- 5. The Hindu. India leads the world in Dengue burden (cited September 12, 2013). Available at http://www.thehindu.com/scitech/health/policy-and-issues/india-leads-the-world-in-Dengueburden-nature/article4592098.ece. Accessed 08April 2013.
- 6. Monath TP. Dengue: The risk to developed and developing countries. Proc Natl Acad Sci USA. 1994;91:2395-400.
- 7. Rigau-Pérez JG, Clark GG, Gubler DJ, Reiter P, Sanders EJ, Vorndam AV. Dengue and Dengue hemorrhagic fever. Lancet. 1998;352:971-6.
- 8. Directorate General of Health Services, National Health Profile, Ministry of Health and Family Welfare, New Delhi, Govt. of India, 2014.
- Disease alerts/outbreaks Report (2012-13) of India, IDSP, NCDC, New Delhi. Available at http://www.idsp.nic.in/idsp/IDSP/DOB2014/.pdf. Accessed on September 15, 2015.
- 10. Kumar A, Rao CR, Pandit V, Sheety S, Bammigatti

- C, Samarasinghe CM. Clinical Manifestations and Trend of Dengue Cases Admitted in a Tertiary Care Hospital, Udupi District, Karnataka. Indian J Community Med. 2010;35(3):386-90.
- Saini S, Kinikar AG. Epidemiology and sero positivity of dengue fever cases in a rural tertiary care hospital of western Maharashtra, India. International Journal of Biomedical and Advance Research. 2013;04(07):743-9.
- 12. Ahmed NH, Broor S. Dengue Fever outbreak in Delhi, North India: A Clinico-Epidemiological study, Indian J Community Med. 2015;40:135-8.
- 13. Karoli R, Fatima J, Siddiqi Z. Clinical profile of dengue infection at a teaching hospital in North India. J Infect Dev Ctries. 2012;6(7):551-4.
- 14. Kale AV, Haseeb M, Reddy S, Khan S, GolwalkarA, Badaam KM. Clinical Profile and Outcome of Dengue Fever from a Tertiary Care Centre at Aurangabad Maharashtra India, Journal of Dental and Medical Sciences. 2014:14-9.
- 15. Kashinkunti MD, Shiddappa, Dhananjaya M. A Study of Clinical Profile of Dengue Fever in a Tertiary Care Teaching Hospital, Sch. J. App. Med. Sci. 2013;1(4):280-2.
- 16. Daniel R, Rajamohanan, Zachariah AP. A Study of Clinical Profile of Dengue Fever in Kollam, Kerala, India. Dengue Bulletin. 2005;29:197-205.

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