General Medicine

STUDY OF CLINICAL AND LABORATORY PROFILE OF DENGUE FEVER WITH REFERENCE TO ACUTE COMPLICATION AND PROGNOSIS IN DR.B.R.AMBEDKAR MEDICAL COLLEGE, BANGALORE.

Shilpa.R *	Senior Resident in Dept of General Medicine, Dr.B.R.Ambedkar Medical College, Bangalore, India. *Corresponding Author
Vishnu N Haygreev	Professor in Dept of General Medicine, Dr.B.R.Ambedkar Medical College, Bangalore, India.
Sreenivasa Chowdary.J	Consultant Radiologist In American Institute of Oncology at Kanuru, Vijayawada, India.

ABSTRACT Dengue fever is an arthropod borne viral fever. It is acquiring epidemic proportion in this part of the world and it has become major public health problem with high mortality.

Earlier it was prevalent in those areas with humid atmosphere and plenty of rain, with changing monsoon pattern this disease is becoming prevalent in deccan land scape including Karnataka. It is vital to recognize at the earliest the signs and symptoms, alteration in biochemical parameters and multisystem involvement pattern in dengue to treat effectively.

This study is undertaken to evaluate common modes of clinical presentation and complications of dengue in our hospital and to correlate these features with laboratory findings which may help us in early diagnosis and better case management.

Out of total 100 cases studied 65 were classified as classical dengue fever, 20 as DHF and 15 as DSS

KEYWORDS : Dengue Haemorrhagic Fever(DHF), Dengue Shock Syndrome(DSS), Serosurvey, haemoconcentration

OBJECTIVES OF THE STUDY

- To study various clinical manifestations of Dengue fever.
- To study laboratory profile in dengue fever.
- To find acute complications and its prognosis.

MATERIALS AND METHODS

Source of data

Suspected cases of Dengue fever in Outpatients and admitted as Inpatient in DR B.R. AMBEDKAR MEDICAL COLLEGE & HOSPITAL, Bangalore.

Pre-test counselling will be given to patients. After taking written informed consent from patients/attenders, case will be enrolled, data will be collected in a predesigned semi-structured questionnaire. Patients evaluation was done by detailed history taking, clinical examination and relevant investigations.

Sample size:

100

Study design:

Prospective clinical study

Duration of study:

2 years

INCLUSION CRITERIA:

All the adult patients with clinical features suggestive of dengue infection, later on confirmed by serology were included in this study.

EXCLUSION CRITERIA:

Dengue fever with any other identified specific coinfection were excluded from the study.

METHODOLOGY:

100 patients, presented with clinical features such as fever, head ache, joint pain and bleeding manifestations admitted to DR B R Ambedkar Medical College and Hospital, Bangalore, were later on confirmed with dengue rapid test were included in study. A detailed demographic data, clinical history, physical examination and relevant baseline investigations were undertaken. Patients with an identified bacterial focus or any other identified specific infection were excluded from the study.

For all cases, the rapid IgM- capture ELISA test, which has become the standard routine test for the serological diagnosis of dengue fever was done.

Serum samples were obtained on an average of 5 to 7 days after DF symptoms had appeared. The cases were followed-up daily for the

clinical and laboratory parameters. The patients were treated with IV fluids, paracetamol, blood products and inotropes as per WHO guidelines for treatment of dengue. These cases were stratified based on the presence or absence of complications like shock and haemorrhage in to various dengue types. The frequency of various signs and symptoms and the values of laboratory tests were compared.

Investigations:

- Complete hemogram
- Serology for dengue IgG IgM and NS1 antigen
- Serum electrolytes, Urine routine, Random blood sugar
- Malarial parasite (QBC), WIDAL
- Blood urea, Serum creatinine, Liver function tests, BT, CT
- Serology for Chikungunya IgM
- Chest Xray, Ultrasound abdomen, ECG
- Following investigations will be done whenever necessary
- HBsAg, Anti HCV, Anti HAV
- Leptospira IgM Antibody
- CSF analysis
- CT brain, MRI brain.

STATISTICAL ANALYSIS:

The collective data as well as the proportions and percentages of variables are projected by appropriate charts, tables and graphs. As there is no comparative study involved, no significant statistical methods were applied.

RESULTS

In the present study highest number of cases were found in age group of 21-30 years (41%), followed by age group of 31-40 years (20%). In the study it was noted that most of the cases were found in the month of August (23%), followed by September (22%), July (15%), October (10%). Out of total 100 cases 64 were male and 36 were female. Out of total 100 cases 82 cases were classified as dengue fever, 15 cases as DHF, and 3 cases of DSS. Majority of the cases from urban area (64%), than from rural area

Table 1: Frequency Of Presenting Symptoms

CLINICAL FEATURES	N	%
FEVER	100	100
HEADACHE	81	81
MYALGIA	77	77
ARTHRALGIA	71	71
LOW BACK ACHE	62	62
RETROORBITAL PAIN	66	66
RASHES	51	51
VOMITING	23	23

DIARRHOEA	11	11
PAIN ABDOMEN	8	8
COUGH	7	7
YELLOWISH DISCOLOURATION	22	22
BREATHLESSNESS	12	12
SORETHROAT	11	11
BLEEDING	13	13

Most common presenting complaint was fever (100%), followed by headache (81%), myalgia (77%), arthralgia (71%) and retroorbital pain (66%). Most of cases presented with fever of duration 3-7 days (81%). Most of the cases presented with moderate fever (60%), followed by high grade (29%) fever. Out of total 100 cases 61 cases presented with remittent fever while 23 cases presented with intermittent fever. Out of 81 cases who presented with headache, majority had headache of duration 3-7 days (55%), while 23% cases presented with headache for <3 days. Both small and large joints were involved in 56.3% cases, and 22.5% cases had involvement of large joints and 21.1% cases had involvement of small joints. Icterus was present in 22 patients, pallor was present in 10 patients, lymphadenopathy in 3 patients. Of total 41 patients who had skin rashes on examination, about 27 patients developed them on central part of body such as chest and abdomen. Majority of patients had haemorrhagic spots over conjunctiva (15%), followed by skin in (10%) of patients. About 22 patients were tested positive for tourniquet test. On abdominal examination, about 25 patients had tenderness on palpation and 6 patients had splenomegaly. Respiratory system examination revealed pleural effusion in 18 patients and crepitations in 10 patients.

Table 2: Haemoglobin Concentration

Hb	N	%
<10	7	7
10-12	44	44
12-14	29	29
14-16	17	17
>16	3	3
Total	100	100

Out of 100 cases 44 cases had haemoglobin concentration of 10-12gm/dl and 3 cases had haemoglobin concentration >16gm/dl. 54 cases had total leucocyte count <4000/cumm.

Graph 1: Paltelet Count

About 5 cases had platelet count <10000/cumm, 22 cases had in the range of 10000-20000/cumm and 49 cases had in the range of 20000-50000/cumm.

Table 3: Analysis Of Various Symptoms:

SI NO	STUDY	FEVER	JOINT PAINS	MYALGIA	HEADACHE	RASHES	BLEEDING	OTHERS
1	Aggarwal et al ⁽⁴⁾ 1998	93						19
2	Dash PK et al ⁽¹⁾ 2005	100	55	70	86	56		10
3	Neerja M et al ⁽²⁾ 2006	100	15	53	74	41	7	12
4	Khan E et al ⁽⁵⁾ 2006	98.3		23.8	7.5	37.8		8.3
5	Nandini et al ⁽⁶⁾ 2014	97.8		90	86	28	2	17
6	Farah fazal et al ⁽⁷⁾ 2015	100	54	61	66	41	21	20
7	Present study 2016	100	71	77	81	51	13	

Fever is the presenting complaint in all cases in my study. In the study conducted by Agarwal et al ⁽⁴⁾, Dash PK et al ⁽¹⁾, Neerja et al ⁽²⁾, Khan et al ⁽⁵⁾, fever was present in 93%, 100%, 100%, 98.3% respectively. The findings in the present study correlated with studies done by Dash P K et al, Neerja et al and Khan et al.

Most common presenting clinical feature was fever (100%) followed by headache (81%), myalgia (77%), arthralgia (71%), retroorbital pain

Graph 2: Dengue Serology

Of all the patients about 35 cases had both IgG and IgM positive on serological investigation.

On investigation for renal function test, serum creatinine was found to be elevated (>1.4mg/dl) in 16 cases. 7 patients had total bilirubin >2mg/dl.

33 cases had bradycardia during their stay in the hospital. About 12 cases had pleural effusion, it was bilateral in majority of cases and bronchopneumonia in 10 cases. About 18 cases had gall bladder wall thickening, 11 cases had ascites 13 patients had both.

Graph 3: Descriptive Statistics Of Different Parameters

DISCUSSION

Our present study included 100 cases of serologically confirmed dengue fever who were admitted to DR B RAMBEDKAR MEDICAL COLLEGE AND HOSPITAL, Bengaluru, between 2015-2017. Mean age of the patients was 30 years. Maximum number of patients were in the age group of 21-30 years (43%) followed by in the age group 31-40 years (20%) and minimum were in the age group of 41-50yrs(11%). The present study included 36 females and 64 male patients. Male to female ratio was 1.8:1. This was corresponding to the other studies by Dash PK et al ⁽¹⁾ and Neerja M et al ⁽²⁾ i.e., 1.28:1, 2:1 respectively.

Highest number of cases were seen in the months of August(23%), September (22%) and July(15%) that corresponds to post monsoon season. This pattern of incidence of dengue fever is seen in most parts of India. It is because of favourable environmental conditions such as humid atmosphere for breeding of vectors during these months. Md. Ayyub et al ⁽³⁾ reported similar results in their study where overall incidence of infection in these months was 33.6%.

(66%) other presenting features were, rashes, bleeding. Few cases presented with unusual symptoms such as vomiting, diarrhoea, sore throat, breathlessness.

- All the 100 cases had fever as their presenting complaint. Most patients had fever for 3-7 days (81%), which was of moderate degree in 60 (60%) patients and high in 29 (29%) cases. Fever had a typical "saddle back" character in 57 (57%) patients. The above

findings correlate with typical pattern of fever described in dengue, which is of short duration and moderate to high degree. The typical "saddle back" pattern is characterised by decline in fever followed by 1-3 days later resurgence.

Of 81 cases the patients presented with head ache 23(23%) had it for duration of <3 days and 57 had it for duration 3-7days, which was of dull aching or throbbing and was diffuse in distribution.

The disease most commonly involved both small and large joints in 40 (40%) patients, while it involved only small joints in 15 (15%) patients. The previous data shows that dengue involve both small and large joints associated with pain and restricted movements which subsides following acute episode without any residual deformity.

In the present study, Dengue fever was seen in 82% of the study population. The incidence of DHF and DSS was 15% and 3% respectively. In a study done by Neerja M et al the prevalence of DF, DHF, DSS was 85%, 5%, 10% respectively. The results of the present study corresponds to a study by Neerja M et al. From these observations, we can conclude that the incidence of each clinical spectrum varies with geographical area.

In present study, 100% patients had thrombocytopenia. The association of thrombocytopenia with dengue virus infection has been proved to be significant ($p < 0.001$). Studies by Cherian T et al⁽⁸⁾, Singh N P et al⁽⁹⁾ and Khan E et al⁽⁵⁾ showed the incidence of thrombocytopenia in 94.7%, 61.39%, 81.4% respectively.

Mean platelet count was 39000/cumm. Platelet count at the time of admission was below 10000 in 5% of the patients and 10000-20000 in 22% of the patients. The bleeding manifestations did not very well correlate with the platelet count. Similar results were observed in a study conducted by S.Sharma et al⁽¹⁰⁾ during an outbreak of dengue fever in Delhi.

Present study showed features of shock in 3% patients. Study conducted by Nimmanitya et al⁽¹¹⁾ showed the incidence of shock in 35% and the study done by Nandini et al⁽⁶⁾ showed 11.5 % shock. From these observations, we can conclude that the incidence of each clinical spectrum varies with geographical area.

Platelet count and tourniquet test did not consistently correlate with each other. Tourniquet test was positive in 24% patients. Other studies have noted varying results in this test. Tourniquet test is not a reliable test for diagnosis as observed in many other Indian studies.

Mean Pulse rate was 67.3 (SD-18). Mean respiratory rate was 16.2cpm (SD-3.6). Hypotension was present in 3 (3%) patients. These were the cases who were diagnosed as DSS. In a previous study by Chandrakanta et al⁽¹²⁾ in 2008, about 10% cases had hypotension. In the present study it comparatively less. In the present study 4 patients diagnosed to be newly diabetic. Of the total 41 patients who had rashes over body most of the patients had rashes distributed centrally 21 patients over chest and abdomen typical of viral fever. In a previous study by Naseemuddin et al⁽¹³⁾ in Karachi about 60% patients had rashes.

Abdominal examination revealed right hypochondriac tenderness in 25 (25%) cases followed by, splenomegaly in 6 (6%), hepatomegaly in 3 (3%) and ascites in 3 (3%) cases.

Respiratory system examination revealed evidence of pleural effusion in 12 (12%) of the patients out of which majority had bilateral pleural effusion. And 10(10%) patients had crepitations on chest Xray. In a study conducted by Rachel Daniel et al⁽¹⁴⁾ pleural effusion was seen in 14% of cases. During their stay in hospital 33 (33%) patients developed bradycardia. In study S Sheetal et al⁽¹⁵⁾ 32 patients had bradycardia.

Evidence of haemoconcentration as indicated by raised Hb% (>16gm%) and HCT(>45%) was seen in 13% and 23% of the patients respectively. There was leukocytopenia (TLC<4000/cumm) in 54% of patients. These findings correlate with previous study conducted by Naseemuddin et al⁽¹³⁾, where haemoconcentration was seen in 15% and leukocytopenia in 54% cases.

Most common LFT abnormality was raised liver enzymes SGOT and SGPT that was seen in 65% and 66% respectively of the patients. TB

was raised > 2mg/dl in 7 patients. The incidence of hepatitis in present study was higher when compared with previous studies this may be attributed to more number of secondary dengue infection in present study.

Elevated serum creatinine was seen in 16% of the patients. Most of such cases suffered with DHF DSS which led to development of ARF. Similar results were observed in a study conducted by Ibrahim N.M et al⁽¹⁶⁾

The most striking USG-Abdomen finding in our study population was GB wall thickening/edema that was seen in 18% of the patients. Ascites was seen in 11 patients and both ascites and GB wall edema seen in 13 patients. Splenomegaly, hepatomegaly were other common findings picked up on ultrasonography. 67% of the patients were positive for IgM anti dengue antibodies, 35% had IgG positivity and 30% were positive for both IgM and IgG antibodies, these patients had severe forms of dengue such as DHF and DSS. Similar results were observed in a study conducted by David W. Vaughan et al⁽¹⁷⁾. The overall case fatality rate in south-east Asian countries is less than 1%. In our study mortality rate was 0% comparable to the following studies.

Early diagnosis, appropriate investigations, strict monitoring and prompt management can help in reducing mortality in dengue haemorrhagic fever.

CONCLUSION

The results of this study describe the clinical features and laboratory investigations in dengue. Leukopenia elevated liver enzymes, thrombocytopenia, elevated serum creatinine may help in differentiating patients with DHF/DSS. Markers of plasma leakage like pleural effusion in chest radiography and ascites in ultrasonography of abdomen helps to differentiate patients with DHF/DSS. Early diagnosis, prompt observation and strategic approach in segregating patients into different grades, aggressive treatment can help decrease the mortality rate.

Bleeding tendencies should be closely watched for. When features of plasma leakage such as pedal edema, pleural effusion, ascites, are present, patient should be closely watched for and should be immediately managed.

A positive Hess test should prompt close observation and early hospital referral, but a negative test does not exclude dengue infection.

The treatment of dengue is mainly supportive. However appropriate fluid management plays a major role in outcome of the disease.

Dengue serosurveillance studies may give some idea about advent, intensity, transmission season, seasonal incidence, waxing and waning, and impending epidemic of dengue and DHF. A large-scale active longitudinal Serosurvey along with the study of vector capacity and vector competence would provide more correct information.

REFERENCES

1. Dash PK, Saxena P, Abhavankar A, Bhargava R and Jana AM. Emergence of dengue virus type 3 in Northern India. Southeast Asian J Trop Med Public Health 2005;36(2):370-7.
2. Neeraja M, Lakshmi V, Teja V D, Umabala P and Subbalakshmi M V. Serodiagnosis of dengue virus infection in patients presenting to a tertiary care hospital. Indian J Med Microbiol 2006;24(4):280-2.
3. Ayyub M, Khazindar AM, Lubbad EH, Barlas S, Alfi AY, Al-Ukayli S. Characteristics of dengue fever in a large public hospital, Jeddah, Saudi Arabia. J Ayub Med Coll Abbottabad. 2006;18:9-13.
4. Aggarwal A, Chandra J, Aneja S, Patwari AK and Dutta AK. An epidemic of dengue hemorrhagic fever and shock syndrome in children in Delhi. Indian Pediatr 1998; 35: 727-32.
5. Khan E, Hasan R, Mehraj J and Mahmood S. Genetic Diversity of Dengue Virus and Associated Clinical Severity during Periodic Epidemics in South East Asia. Karachi, Pakistan. Current Topics in Tropical Medicine 2006;91-105.
6. Nandini Chatterjee, Mainak Mukhopadhyay, Sinjon Ghosh, Manas Mondol, Chiranjib Das, Kartik Patar An Observational Study of Dengue Fever in a Tertiary Care Hospital of Eastern India Journal of the association of physicians of India, march 2014, VOL. 62.
7. Farhan Fazal, Sangram Biradar. "Clinical and Laboratory Profile of Dengue Fever". Journal of Evidence based Medicine and Healthcare; 2015, Vol 2(09):1136-1147.
8. Cherian T, Ponnuraj E, Kuruvilla T, Chellam K, John TJ and Raghupathy P. An epidemic of dengue hemorrhagic fever and dengue shock syndrome in and around Vellore. Indian J Med Res 1994; 100: 51-6.
9. Singh NP, Jhamb R, Agarwal SK, Gaiha M, Dewan R, Daga MK, et al. The 2003 outbreak of Dengue fever in Delhi, India. Southeast Asian J Trop Med Public Health 2005;36:1174-78.
10. Sharma S, Sharma SK, Mohan A, et al. Clinical profile of dengue hemorrhagic fever in adults during 1996-outbreak in Delhi, India. Dengue Bull 1998; 22:20-27.
11. Nimmanitya S. Clinical manifestations of dengue/yellow haemorrhagic fever. In: WHO Regional Office for South-East Asia. Monograph on dengue/dengue

- haemorrhagic fever. New Delhi: WHOSEARO 1993. p. 48–61. (Regional Publication, SEARO; No. 22).
12. Chandrakanta, Rashmi Kumar, Garima, Jyotsana Agarwal, Amita Jain, Rachna Nagar .Changing clinical manifestations of dengue infection in north India. Dengue bulletin 2008. 32,118-126.
13. Naseem Salahuddin, Farheen Ali, Muhammad Ali and Fauzia Rashid. Dengue Fever Outbreak in Karachi, A Clinical Experience infectious disease Journal of Pakistan 2005.117-200.
14. Rachel Daniel, Rajamohanam and Aby Zachariah Philip, A Study of Clinical Profile of Dengue Fever in Kollam, Kerala, India, Dengue Bulletin. Vol 29, 2005.
15. Sheetal S, Jacob E. A study on the cardiac manifestations of dengue. J Assoc Physicians India. 2016;64(5):30–34.
16. Ibrahim NM, Cehong I; Dengue hemorrhagic fever at Kualalampur hospital: retrospective study of 102 cases. Br J ClinPract., 1995;49:189-91.
17. David W Vaughan. Dengue viremia titre, antibody response and virus serotype correlate with disease severity. The journal of infectious disease 2000;181:2-9.