

**Study of Clinical and Haematological Profile of Dengue Fever**

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**Abstract:**

**Background:** Dengue fever is a mosquito borne illness that occurs in tropical and subtropical areas of the world. Mild dengue fever causes a high fever and flu like symptoms. The severe form of dengue fever can cause serious bleeding, a sudden drop in blood pressure (shock) and death.

**Methods:** Data consists of primary data collected from the patients who are admitted in Shardaben Hospital, Ahmedabad in August 2020 to October 2022 and 100 patients were taken.

**Outcome:** In present study, no mortality was recorded in dengue fever in August 2020 to October 2022, All patient had good recovery.

**Conclusion:** Early diagnosis and adequate fluid management plays disease outcome. blood pressure, platelets, haematocrit an important role in should be monitored closely to evaluate the progress of disease.

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**Introduction**

Dengue fever (DENV) is the most rapidly spreading mosquito borne viral disease in the world. The dengue fever transmitted by aedesegypti mosquito across tropical and subtropical attitudes. Based on the antigenic difference, dengue fever can be divided into four serotypes, DENV 1-4. [1]

Breeding of Aedes mosquitoes was more prevalent in urban areas, but now a days, trend is changing as a result of urbanisation of rural areas.

Severity of the illness is determined by various risk factors such as age, pre-existing illness, infecting serotype and secondary infection. A second infection with a different type of serotype leads to more severe form of the disease than the primary infection.

**Aims:** Study of clinical and haematological profile of dengue fever.

**Objective**

- To evaluate the correlation between clinical & haematological of 100 patients with dengue NS1 Positive / Dengue Ig M /Ig G positive cases.

- In this study the correlation between haematological alterations and progression of probable dengue → dengue with warning signs → Severe dengue in adults will be assessed.

**Materials and Methods**

Data consists of primary data collected from the patients who are admitted in Shardaben Hospital, Ahmedabad in August 2020 to October 2022 and 100 patients were taken.

**Inclusion Criteria**

- All patients above the age of 12 years
- Both genders.
- Patients positive for NS1, IgM, IgG dengue serology.

**Exclusion Criteria**

- Patients with underlying haemostatic disease.
- If routine laboratory testing suggested a bacterial, parasite, or any viral infection other than dengue infection or any other disease.
- Consent not given.
- Pregnant female.

**Observations and Results**

In our study, we collected data regarding clinical presentation, haematological & ultrasonographic

findings of 100 dengue patients positive for NS1 antigen/IgM/IgG positive serology.

**Table 1: Age Distribution among Study Population**

Age in Years	No. of Patients	Percentage
12 – 20	19	19%
21 – 30	40	40%
31 - 40	20	20%
41 – 50	9	9%
51 – 60	7	7%
> 60	5	5%
Total	100	100%

Patients of 21 -30 years of age (40%) was most commonly affected age group in our study followed by 31-40 years of age (20%) and less than 20 year of age (19%). 5% of patients were above 60 years of age.

**Table 2: Gender Distribution**

Gender	No. of Patients	Percentage
Male	58	58%
Female	42	42%
Total	100	100%

Out Of 100 patients, 58 patients were male (58%), 42 patients were female (42%). Males were more commonly affected than females.

**Table 3: Study of NS1 Serology among Study Population**

NS1	No. of Patients	Percentage
Positive	66	66%
Negative	34	34%

Dengue NS1 antigen assay was done in 100 patients and it was positive in 66 (66%) patients, and negative in 34 (14%) patients.

**Table 4: Dengue Serology**

Antibodies Positive	No. of Patients	Percentage
IgM	56	56%
IgG	1	1%
Both	43	43%

In 100 patients, 56 were positive for IgM ,1 patient were positive for IgG, 43 were positive for both IgM and IgG.

**Table 5: Symptoms of Dengue Fever among Study Population**

Symptoms	No. of Patients
Fever	100
Joint Pain	64
Myalgia	54
Headache	78
Retro-Orbital Pain	32
Abdominal Pain	16
Vomiting	44
Diarrhea	16
Petechiae	14
Bleeding Gums	5
Epistaxis	7
Increased Bleeding PV	5
Malena	12
Hematuria	2

In the present study, most common symptoms were: fever (100%), headache (78%), joint pain (64%), myalgia (54%). The most common bleeding manifestations were: petechiae (14%), and malena (12%).

**Table 6: Haematocrit among Study Population**

Haematocrit	No of Patients	Percentage
Normal	58	58%
Decreased HR	24	24%
Increased HR	18	18%
Total	100	100%

Hematocrit altered in 42 (42%) patients, among them 24 had decreased hematocrit and 18 had increased hematocrit. Out of 24 patients with decreased HR 10 patients had platelet transfusion.

**Table 7: Leucopenia in Dengue among Study Population**

Diagnosis	Leucopenia					
	<4000		4000-10000		>10000	
	No of Patients	Percentage	No of Patients	Percentage	No of Patients	Percentage
Dengue Fever	27	52%	12	28%	0	0%
DF with warning signs	21	40%	26	62%	6	100%
Severe Dengue	4	8%	4	10%	0	0%
Total	52	100%	42	100%	6	100%

In our study, leucopenia was seen 27 (52%) of patients in dengue fever, 21 (40%) patients in dengue fever with warning signs, 4 (8%) in severe dengue.

**Table 8: Thrombocytopenia among Study Population**

Thrombocytopenia	No Of Patients	Percentage
< 10000	6	6%
10000 - 20000	8	8%
20000 - 50000	28	28%
> 50000	58	58%
Total	100	100%

All 100 patients had thrombocytopenia.

- All Patients were categorized according to platelet count.
- 10,000
- 10,000 -20,000
- 20,000- 50,000
- >50,000

**Table 9: Co-Relations Between Bleeding Manifestations and Platelet Count**

Platelet Count	Bleeding Manifestation		Total
	Present	Absent	
< 10000	6 (100%)	0 (0%)	6 (100%)
10000 - 20000	6(75%)	2 (25%)	8 (100%)
20000 - 50000	9 (32%)	19 (68%)	28 (100%)
> 50000	1 (2%)	57 (98%)	58 (100%)

Above table shows 22 patients had bleeding manifestations, in our study petechiae, Malena, epistaxis, bleeding gums, increased bleeding per vagina, haematuria included as bleeding manifestations.

- In our study, patient had multiple bleeding manifestations present and platelet transfusion are given to those patients.
- All patients with platelet count <10000 had bleeding manifestation present.

**Table 10: Ascites in Dengue among Population**

Diagnosis	Yes		No	
	No of Patients	Percentage	No of Patients	Percentage
Dengue fever	0	0%	39	62%
DF with warning signs	35	95%	18	29%
Severe Dengue	2	5%	6	9%
Total	37	100%	63	100%

In these 37 patients, 35 patients (95%) had dengue fever with warning signs, 2 patients (5%) had severe dengue.

**Table 11: B/L pleural effusion in dengue among the study population**

Diagnosis	B/L Pleural Effusion			
	Yes		No	
	No of Patients	Percentage	No of Patients	Percentage
Dengue fever	0	0%	39	42%
DF with warning signs	7	88%	46	50%
Severe Dengue	1	12%	7	8%
Total	8	100%	92	100%

8 patients have B/L pleural effusion, In which 7 (88%) had dengue fever with warning signs, 1 (12%) patient had severe dengue.

## Discussion

- During the period of August 2020 to October 2022, 100 patients admitted to SCL hospital with positive dengue serology (NS1, IgM, IgG) were included in this study.
- 100 patients, most of the cases 40 % occur in the age group of 21 -30 years, and youngest was 16 years and the eldest was 86 years.
- Out of 100 patients admitted with dengue, 58 were male and 42 were females with a ratio of 1.38: 1.
- NS1 Antigen assay was done in 100 patients, out of which 66 patients (66%) were positive and 34 patients (34%) were negative for dengue NS1 antigen.
- Dengue IgM and IgG serology was done in 56(56%) and 43 (43%) patients who had primary and secondary dengue infection respectively. 1 patient (1%) had recent dengue infection.
- In the present study, fever was present in all patients (100%), followed by headache in 78 (78%) patients, joint pain in 64 (64%) patients myalgia in 54 (54%) patients. bleeding manifestations were petechiae (14%), Malena (12%), epistaxis (7%), increased bleeding per vagina (5%), bleeding gums (5%), and haematuria 2 (2%).
- In the present study, only one patient had severe microcytic hypochromic anaemia. Mean haemoglobin in the present study was 14.145 g/dl ranging from 5.4 g/dl to 19.1g/dl and the mean haematocrit was 42.71 ranging from 18.7 % to 58.5%
- Leucopenia was observed in 52 patients. The mean leucocyte count was 4443 cells/cu mm, varied from 1000 cells / cu mm to 15,300 cells /cu mm. Leucopenia was seen in 27 (52%) patients with dengue fever, 21 (40%) patients in dengue fever with warning signs and 4 (8%) patients in severe dengue.
- Thrombocytopenia was observed in all patients (100%). 72 (72%) patients had a platelet count of <1 lakh / cu mm as per WHO criteria. 28 patients had a platelet count of >1 lakh/ cu mm but < 1.5 lakh / cu mm. Mean platelet count in this study was 88150 cells / cu mm.

### Platelet count and bleeding manifestations

- 22 of 100 patients developed bleeding manifestations. petechiae seen in 14 patients, and melena seen in 12 patients, followed by epistaxis seen in 7 patients, bleeding gums and increased bleeding per vagina seen in 5 patients and haematuria seen in 2 patients.
- Patients had multiple bleeding manifestations present in our study. As platelet count decreases, bleeding manifestations increased. 21 out of 22 patients who had bleeding manifestations had platelet count < 50000.

In microcirculation, platelet count of 5000 – 10,000 cu mm<sup>3</sup> is required to maintain the vascular integrity. if platelet count were markedly decreased, petechiae usually appear first especially in the areas of increased venous pressure.

- Petechiae indicates there is decreased number of platelets and doesn't indicate platelet dysfunction.
- In the present study, Ascites was the most common finding seen in 37 patients, B /L pleural effusion in 8 patients.

## Summary

- To conclude the study, dengue was most prevalent among young males & female. In this study dengue fever with warning signs is the most common followed by dengue fever & severe dengue. Out of those patients, patients presented in early phase of infection, manage & recovered well.
- Clinically presented with classical features of dengue such as fever, headache, joint pain and myalgia as the common presenting symptoms.
- Petechiae, Malena, Epistaxis is most common bleeding manifestation in dengue fever with warning signs & severe dengue.
- Thrombocytopenia, Leucopenia and decreased hematocrit, sonographic finding such as ascites, pleural effusion is seen in dengue fever with warning signs & severe dengue patients.
- Bleeding risk increase if platelet count goes below 20, 000 cells / cu mm.
- Thrombocytopenia is related with bleeding manifestations and severity of dengue infection.
- Treatment of dengue infection is mainly supportive care. Antibiotics were given to dengue fever with warning signs & severe dengue patients to prevent secondary bacterial infections.

## Conclusion

- Early diagnosis and adequate fluid management plays an important role in disease outcome.
- blood pressure, platelets, haematocrit should be monitored closely to evaluate the progress of the disease.

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