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"Study Of The Clinical Profile Of Dengue Fever"

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Abstract
Aims and objectives
To study the clinical profile of dengue fever.
To correlate clinical features wit treatment outcome.
Methods
In present study, clinical profile of 100 serologically proven dengue cases were studied in mvjmc&rh.
Results
Out of 100 patients 68 % had df, 22 % had dhf and 10 % of the patients had dss. Majority of the cases (45%) belong to the age group of 26-50 years. Dengue fever had typical seasonal variation, maximum cases during june to september. The most common clinical presentation was fever which was seen in 98% of the cases. Other common signs and symptoms included are myalgia (88%), headache (52%), arthralgia (40%), rashes (34%), vomiting (24%) and pain abdomen (22%).signs suggestive of plasma leakage such as pedal edema (22%), ascites (38%), and pleural effusion (38%) were present
Conclusion
The most common symptom is fever. Majority of the cases have benign course.
Keywords: *Dengue fever; myalgia; plasma leakage;*

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I. Introduction

Dengue is an acute febrile disease of viral etiology, the onset of which is usually benign in its classic form, and serious when presenting as dengue hemorrhagic fever / dengue shock syndrome (DHF/DSS) [1].Dengue fever is caused by Dengue virus belonging to the genus Flavi virus (A single stranded non-segmented RNA viruses). Five serotypes have been isolated so far, namely DENV-1, DENV-2, DENV-3, DENV-4 and DENV-5[2]. The likely cause of emergence of the new serotype could be genetic recombination, natural selection and genetic bottlenecks. There is no indication of the presence of DENV-5 in India.

Dengue is the most rapidly spreading mosquito-borne viral disease in the world. In the last 50 years, incidence has increased 30-fold with increasing geographic expansion to new countries and, in the present decade, from urban to rural settings. An estimated 50 million dengue infections occur annually and approximately 2.5 billion people live in dengue endemic countries. In India dengue has seen resurgence in recent times. Reported case fatality rates reported from India are 3-5%[1].It can range from a nonspecific febrile illness to severe disease i.e. dengue hemorrhagic fever and dengue shock syndrome.

II. Materials And Methods

Study Design

The present study is prospective observational study done on inpatients of department of General Medicine in MVJ Medical College and Research Hospital, Hoskote. A total of 100 patients were studied who were fulfilling inclusion criteria/exclusion criteria after obtaining the written informed consent. The study is being done from the period August 2016 to September 2018

Inclusion Criteria

- Serologically proven dengue cases
- Age more than 18 years

Exclusion Criteria

- Alcoholic liver disease
- Drug induced thrombocytopenia
- Co-Infection of dengue with other infections causing thrombocytopenia like
  - Bacterial- enteric fever, gram positive & gram negative sepsis, leptospirosis
  - Viral-HIV
  - Protozoal- malaria

Method of Collection of data:

Demographic data, duration of symptoms, atypical symptoms, and comorbid illness were documented. All patients were examined in detail. Vitals were recorded. Signs of plasma leakage, bleeding manifestations were carefully documented. Respiratory, cardiovascular, neurological and abdominal examination was done in detail.

III. Results

This observational study was done in MVJMC &RH, Hoskote, during the period of August 2016 to September 2018, which includes study of clinical profile of dengue fever.

Clinical Spectrum Of Dengue Cases

A total of 100 patients admitted to our hospital, whose dengue serology was positive were taken up for the study. Out of 100 patients, 68 patients were diagnosed to have classical Dengue fever, 22 patients were diagnosed to have Dengue Haemorrhagic fever and 10 patients were diagnosed to have Dengue Shock Syndrome as per WHO criteria[1]

Age Distribution

Our study shows dengue was more common and severe in the age group of 26-50 years which is seen in 45 patients and the next common group found to have high prevalence is 18-25year age group and dengue is less commonly seen in elderly patients which has been depicted in figure 1.As per recent studies younger age (< 30 years) people are getting more affected. This could be due to be related to differences in lifestyle, time spent outdoors near vectors, sleeping without mosquito nets, or other aspects of inadequate disease prevention among the young. Another explanation could be that the disease can create lifelong immunity for the individual, so that older persons who have been exposed more often may have more resistance, decreasing the morbidity rate[3].

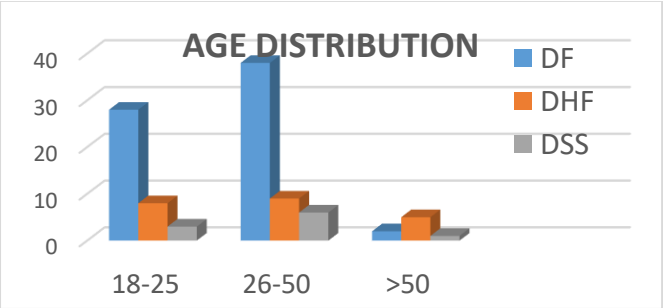

Figure 1 Age distribution among dengue patients

Sex Distribution

Dengue cases were more common in male and male: female ratio is 3:2 as shown in figure 2. Dengue is more severe in male patients especially dengue shock syndrome which was seen in 70% of male patients.

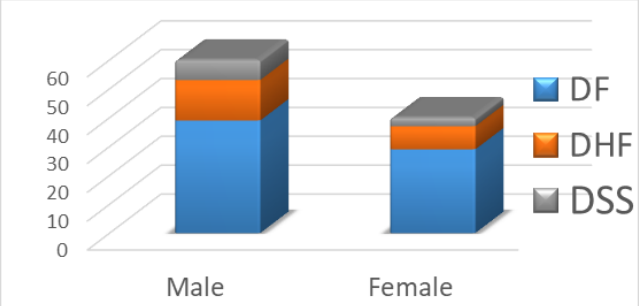

Figure 2 -Sex distribution among dengue case

Seasonal Variation Of Dengue Cases

Month of the year	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec
No of cases	2	1	2	1	3	6	11	20	26	14	9	5

Table 1 Seasonal variation of dengue cases distributed over months of the year

As we can see from Table 1, dengue season starts from June reaches peak in august and September and gradually decreases from December. Rainy season or post rain season favors the artificial collection of water and humidity favors mosquito development. Temperature in the range of 22-31 degree Celsius and relative humidity of 70-90% provide a suitable environment for breeding of Aedes mosquito[4].

IV. Clinical Features- Symptoms Among Dengue Patients

The most common clinical presentation of dengue was fever which was seen in 98 patients out of 100.Other common clinical features noted include myalgia, headache and rashes. Though retro orbital pain is classically described in dengue patients it was seen only in 16 patients. Nausea, vomiting (24), pain abdomen (22) and diarrhea (6) were also seen in dengue patients which is shown in figure 3.

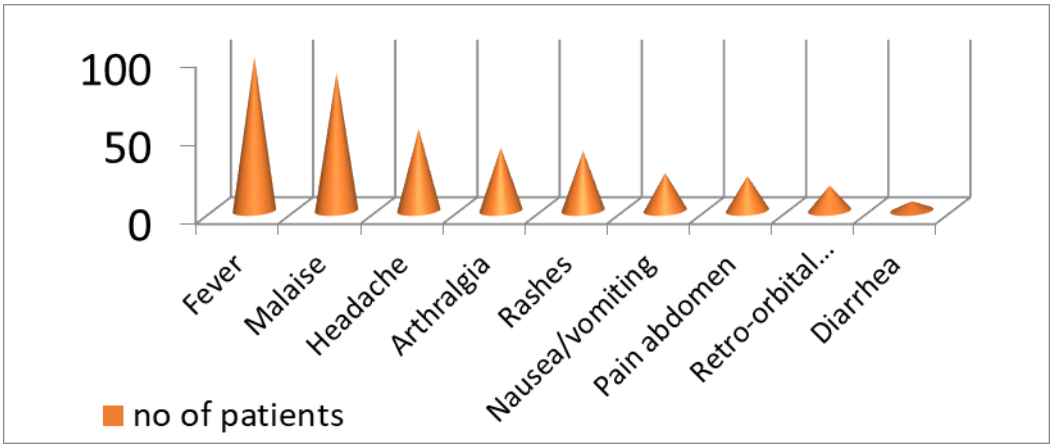

Figure 3- Clinical features- symptoms in dengue patients

V. Bleeding Manifestations

In our study bleeding manifestations were mild in the form of maculopapular rashes in most of the cases. Malena, petechiae, ecchymosis, purpura, gum bleeding and hematuria were also seen. In our study rashes was seen in 34 patients ,Malena and petechiae in 14 patients, ecchymosis in 6 , purpura and gum bleeding in 4 patients and hematuria in 3 patients which is shown in and figure 4.

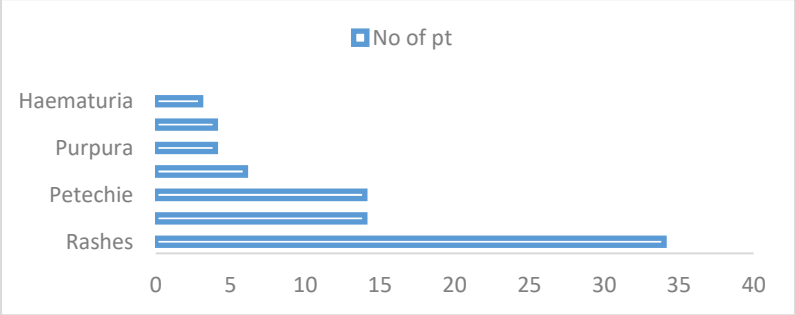

Figure 4-Various bleeding manifestations in dengue patients

VI. Clinical Features-Signs

Signs	No of patients (n=100)
Febrile	98
Bradycardia	48

Hypotension	**42**
Ascites	**38**
Pleural effusion	**38**
Tachycardia	**28**
Hepatomegaly	**20**
Splenomegaly	**18**

Table 2- Clinical features -Signs of dengue

Fever was the most common sign which was seen in 98% of the patients. Bradycardia was the next common feature noted followed by hypotension, ascites, pleural effusion, tachycardia followed by hepatosplenomegaly which is shown in table 2.

VII. Atypical Manifestations

Atypical manifestations are commonly seen nowadays.

Cardiac manifestations

Among cardiac manifestations (table 3), bradycardia was most commonly seen followed by cardiac failure, myocarditis, ventricular ectopic and arrhythmia which recovered spontaneously with the resolution of the illness.

Cardiac Manifestation	No of cases
Bradycardia	**48**
Cardiac Failure	**8**
Myocarditis	**6**
Ventricular ectopic	**4**
Arrhythmia	**2**

Table 3- Cardiac manifestations in Dengue

B. Cns Manifestations

Manifestation	No of cases N=100
Cerebral anoxia/ edema	**4**
Seizures	**3**
Encephalopathy	**1**
Cerebral hemorrhage	**1**
Infarction	**1**

Table 4-CNS manifestations in Dengue

Among CNS manifestations (table 4) cerebral edema was commonly noted followed by seizures, encephalopathy, cerebral hemorrhage and infarction. Among these encephalopathy patient recovered in 6 month with residual weakness. Cerebral infarction patient succumbed to the disease, rest recovered completely with symptomatic treatment.

C.Gastrointestinal

48 patients had hepatitis, 20 had hepatomegaly and 1 patient had acute pancreatitis. They recovered completely within 1 week.

D. Others

Acute kidney injury was seen in 4 patients and ARDS in 2 patients.

Correlation Of The Results

1. Various bleeding manifestations & correlation with platelet count in dengue

Bleeding manifestation	No of pt. n=40/100 (%)	Platelet count <20,000	Platelet count 20,000-50,000	Platelet count 50,000-1,00,000	Platelet count >1,00,000
Rashes	34(85)	16	8	8	2
Malena	14(35)	10	3	1	0
Petechiae	14(35)	11	1	1	1
Ecchymosis	6(15)	4	1	1	0
Purpura	4(10)	2	1	1	0
Gum bleeding	4(10)	3	1	0	0
Hematuria	3(7.5)	3	0	0	0

Table 5-Various bleeding manifestations & correlation with platelet count in dengue patients

Bleeding manifestations were seen in 40 patients .In most of them the bleeding manifestations were mild in the form of maculopapular rashes. It was correlating directly with platelet count. Lesser the platelet count more were the bleeding manifestations. Many patients had both maculopapular rash & petechiae esp. palatal petechiae was common. Malena, and hematuria were seen more often in DSS with platelet count <20,000 cells/cu mm.it has been shown in table 5.

Correlation Of Severity Of Clinical Features & Treatment Outcome

Treatment /clinical spectrum of Dengue	Symptomatic	Platelet transfusion	Fresh frozen plasma	Whole blood	Treatment Outcome	
					Improved & discharged	Death
Classical Dengue n=68	68	0	0	0	68	0
DHF n=22	22	13	4	0	22	0
DSS n=10	10	9	8	2	6	4

Table 6 Correlation of severity of clinical features & treatment outcome

All our dengue patients received symptomatic treatment. 68, classic dengue cases received only symptomatic treatment and all of them recovered and were discharged. Approximate duration of hospital stay was 4 day. Out of 22 dengue hemorrhagic fever cases, apart from symptomatic treatment, 13 cases received platelet transfusion, 4 patients received fresh frozen plasma. All of DHF cases recovered and were discharged. Among 10 cases of dengue shock syndrome 9 patients received platelet, 8 patients received FFP, 2 patients received whole blood. Among these 6 patients recovered and discharged and 4 patients succumbed to disease. Dengue shock is more commonly associated with poor outcome. This is shown in table 10.

VIII. Discussion

Dengue is one of the most important viral disease emerging globally. The majority of symptomatic infection results in relatively a benign course. However, a small proportion of patients will develop clinical features including bleeding, organ impairment, and endothelial dysfunction with increased capillary permeability causing hypovolemic shock that can lead to cardiovascular collapse. The severity of clinical manifestations and hematological complication are important in treatment and prognosis of the disease. No antiviral agents or vaccines are effective against dengue, timely diagnosis and effective management will prevent complications.

Classification Of Dengue

CLASSIFICATION	Patel P M.et.al[5] n=250(%) Gujarat	Shekar EC et al[6] N=100 Telangana	Raimunda.et.al.[7] N=88 Brazil	Our study n=100
Classic dengue fever	208(83.2)	81	16(10.4)	68
Dengue haemorrhagic fever	40(16)	10	46(29.9)	22
Dengue shock syndrome	02(0.8)	9	26(16.9)	10

Table 7-Comparison of clinical spectrum of dengue of our study with other studies

Out of 100 patients of dengue, there were 68 classic dengue fever, 22 dengue haemorrhagic fever and 10 dengue shock syndrome were noted as shown in table 7. Majority of dengue cases are mild i.e. classic dengue fever, which is also seen in our study. Other studies like Patel M. et.al[5], Shekar EC.et.al[6] and Raimunda.et.al[7] also show similar results that majority of the cases were classical dengue followed by Dengue haemorrhagic fever and then dengue shock syndrome.

Age And Sex Distribution

Age at dengue virus infection plays a key role in characterizing the risks of clinical attack and disease severity. Among 100 patients 45 % of patients were of age group 26-50 and 43% of patients were of age group 18-25 years as shown in table 8. Other studies like Pardeshi.et.al[8], Deshwal.et.al[9], and Babaliche.et.al[10] also show maximum incidence of dengue in the age group of 18-25 year. This susceptibility may be due to various factors like time dependent variations in epidemiological, ecological and demographical dynamics.

AGE in years	Pardeshi.et.al[8] N=420 Mumbai	Deshwal.et.al[9] n=515(%) UP	Babaliche.et.al[10] n=100 Belgaum	our study n=100
<18	130	62	0	0
18-25	190	324	60	43
26-50	55		20	45
>50	45	129	16	12

Table 8-Comparison of Age distribution among dengue cases of our study with other studies

Among 100 cases, 60 were male and 40 were female. Male: Female ratio observed was 3:2. Similar observation was made by others - 2.67:1 in Deshwal.et al[9], 1.55:1 in Patil P M.et al[5] 1.13:1. In Shekar EC.et.al[6] showed increased preponderance among males due to increased outdoor activities of male and more exposure to the environment causing dengue.

Clinical Features In Dengue Patients

After the incubation period of 3-14 days patients usually present with fever, headache, retro-orbital pain, and arthralgia. In our study, the most common clinical feature was fever which has been reported in other studies like Deshwal.et.al[9], Babaliche.et.al[10] and Ahmed.et.al[11],which has been shown in Table 9.other common clinical features include myalgia, headache, rashes, nausea, pain abdomen, bradycardia, pleural effusion.

During the stage of viremia, patient presents with fever and as virus is cleared from blood the fever subsides. Fever, a response to exogenous pyrogens, is believed to be mediated mainly by cytokine prostaglandin pathways. Malaise and flu like symptoms of dengue is due to cytokine release. Myalgia is associated with pathological changes in the muscles and moderate perivascular mononuclear infiltrate with lipid accumulations. Musculoskeletal pain is due to viral infection of bone marrow components like macrophages, dendritic cells which are CD 11b /CD 18(MAC-1) - positive and reticular cells which are nerve growth factor receptor –positive of infected Aedes mosquitoes, especially Ae. Aegypti. Retro orbital pain can be part of musculoskeletal pain, can be due to subconjunctival hemorrhage and retinopathy sparing the macula, stellar neuroretinitis and retinal hemorrhages.

Symptoms	Deshwal.et.al[9] n=515(%) UP	Babaliche.et.al[10] n=100(%) Belgaum	Ahmed.et.al[11] N=74 Saudi Arabia%	Our study n=100
Fever	515 (100)	100(100)	62.2	98
Myalgia	467(90.7)	72(72)		88
Headache	488(94.8)	82(82)	22.9	52

Rashes	195(37.9)	36(36)	13.5	34
Nausea/ vomiting	28(5.4)	20(20)	40.5	24
Abdominal pain	126(24.5)	49(49)	27.03	22
Retro-orbital pain	94(18.3)	62(62)	8.1	16
Arthralgia		31(31)		40
Diarrhea	13(25)	2(2)		06
Bleeding manifestations		22(22)	5.4	20
Bradycardia	43(8.3)			48
Pleural effusion	103(20)			38
Ascites	84(16.3)			38
Hepatomegaly	76(14.8)		32	20

Table 9 Comparison of various clinical manifestations of Dengue

Atypical manifestations are also found frequently in our study. Some of them are noted and compared with other studies. The exact mechanism of bradycardia is not known, various theories have been postulated, some of them propose that bradycardia is due to direct virus mediated myocarditis, immune (cytokine) mediated dysfunction of the SA node. Pleural effusion and ascites are mainly due to plasma leakage. Pain abdomen is attributed to various causes like hepatitis, pancreatitis, Acalculous cholecystitis and peptic ulcer disease. Elevation of liver enzymes with or without hepatomegaly and the proposed causes include direct viral toxicity or dysregulated immunological injury in response to dengue virus.

IX. Conclusion

The present study had an objective of studying clinical profile of dengue fever. Among clinical features, fever is most common followed by malaise, headache and arthralgia.The important clinical predictors of mortality and morbidity are signs of fluid accumulation, mucosal bleeding, and warning signs of dengue. Majority of the cases have benign course; early and adequate management will prevent complications and improve outcome.

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