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A Study of Clinical and Laboratory Profile of Dengue Fever in Tertiary Care Hospital in Central Karnataka, India

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Result: Out of 146 seropositive cases, 92 were males and 54 were females. Most of the cases reported in young age groups (i.e. 20-30 years) compared to other age groups. NS1 antigen, IgM and IgG antibody was found reactive in 112 (76.71%), 2 (1.36%) and 6 (4.10%) patients respectively.

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Strictly as per the compliance and regulations of:

A Study of Clinical and Laboratory Profile of Dengue Fever in Tertiary Care Hospital in Central Karnataka, India

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Result: Out of 146 seropositive cases, 92 were males and 54 were females. Most of the cases reported in young age groups (i.e. 20-30 years) compared to other age groups. NS1 antigen, IgM and IgG antibody was found reactive in 112 (76.71%), 2 (1.36%) and 6 (4.10%) patients respectively. The commonest presenting clinical symptoms in patients are fever (in all patients, 100%), severe headache (n=110, 75.34%), Nausea/Vomiting (n=84, 57.53%) and Fatigue (n=68, 46.57%). The bleeding manifestations were found in 14 patients (9.58%) which includes Gum bleeding, Hematuria, Hematemesis and Malena. Bleeding manifestations was associated with severe thrombocytopenia, were in 33.33% of patients.

Discussion: Early recognition and prompt management is essential to reduce the morbidity and mortality associated with disease.

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I. Introduction

The word "dengue" is derived from Swahili phrase ka-dinga pepo means "cramp like seizure". First clinical case report was by Benjamin Rush in Philadelphia, who describes dengue as "Back born fever" because of symptoms of myalgia and arthralgia.[1] Dengue fever is currently the second most prevalent vector born disease in the world,[2]posing threat to nearly half of world population. Each year has been as many as 100 million cases of dengue fever with 500000 cases of DHF and an estimated 22000 dengue related deaths. Annually in more than 100 countries including South America, Central America, Caribbean, India, South east Asia and Africa.[3] Increased urbanization and population growth facilities have contributed to the increased occurrence of Dengue fever.[4] The seasonally of transmission of dengue are more in monsoon and post monsoon.[5] In India dengue is prevalent since last two centuries and first evidence of occurrence is from Vellore district in Tamil Nadu during 1956. Every year there has been upsurge in occurance.[6] In last decade, major outbreaks and death have occurred in Northern India (Haryana, Punjab, Utter Pradesh), Southern India (Andhra Pradesh, Tamil Nadu and Karnataka), Western India (Gujarat, Rajasthan) and Eastern India (West Bengal). The case fatality has increased to above 1% are last 10 years.[7]

Dengue fever is an acute viral illness, prevailing in tropical and subtropical countries caused by fare distinct serotypes- Dengue virus 1, dengue virus 2, dengue virus 3 and dengue virus 4.[8] Serious manifestations occur more frequently in reinfections with a co-circulation of second serotype also reported.[9]Dengue fever is transmitted by Aedes Egypti mosquitoes and also by Aedesalbopictus and Aedespolynesiensis. Clinical manifestations range from self-limiting flu like illness called Dengue fever to severe often with unpredictable symptoms in DHF/DSS.[10] DHF is characterized by onset of dramatic haemorrhagic manifestations. DSS is most severe form of DHF that is due significant intravascular volume depletion, haemodynamic compromise poor organ and tissue perfusion.[11]Hence clinicians must be able to identify the warning signs of dengue fever like severe abdominal pain, tenderness, persistent vomiting, mucosal bleeding, liver enlargement > 2 cm, clinical fluid accumulation, lethargy, restlessness, increase hemocrit with rapid decrease in platelet counts for the better management of dengue cases.[12]

The present study was conducted to evaluate the clinical and laboratory profile of dengue in the central Karnataka region of South India.

II. Materials and Methods

The present prospective study was carried out between July-October, 2013 in BMCH & RC in central Karnataka. The study included seropositive dengue fever in-patients admitted in the medical wards in the

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age group of 18-75 yrs. The test kit used for the sero diagnosis of dengue was "Dengue day 1 test kit (J. Mitra & co. Pvt. Ltd.)" which shows NS1, IgM and IgG reactivity towards dengue fever. Patients were assessed for clinical manifestations such as fever, along with other cardinal symptoms like headache, anorexia, nausea/vomiting, myalgia, joint pain and retro-orbital pain. Complications at any stage of dengue fever were recorded. The patient were subjected to routine laboratory tests such as complete hemogram, liver function test, renal function test, serum electrolytes and urine microscopy test. Serial platelet count and hematocrit levels were monitored during the hospital stay. The patients were also subjected to radiological and other investigations when clinically warranted. The patients were also investigated for other common causes of fever endemic in our region such as Malaria, Typhoid and Leptospirosis. The collected data was analyzed by using Microsoft excel and Microsoft access.

III. Results

Out of 146 seropositive cases, 92 were males and 54 were females. Most of the cases reported in young age groups (i.e. 20-30 years) compared to other age groups. Majority of patients were from Chitradurga city area followed by Hiriyur and other different area of central Karnataka. People who are working outdoor, schooling and spending more time outside than home were more affected. (Table 1)

Table 1 : Socio-demographic characteristic of Patient (n=146)

Characteristic	No. of patients	Percentage (%)
Age group (Years)		
18-30	100	68.49
31-40	24	16.43
41-50	14	9.58
51-60	8	5.47
61-75	0	0.00
Sex		
Male	92	63.01
Female	54	36.98
Place of Residence		
Chitradurga	82	56.16
Hiriyur	42	28.76
Others	22	15.06
Occupation		
Farmer	50	34.24
Labour	20	13.69
Student	38	26.02
Housewives	14	9.58
Business	24	16.43

The figure 1 shows that pattern of Seropositivity of dengue in central Karnataka region. We notified that NS1 antigen positive patients are more during our study.

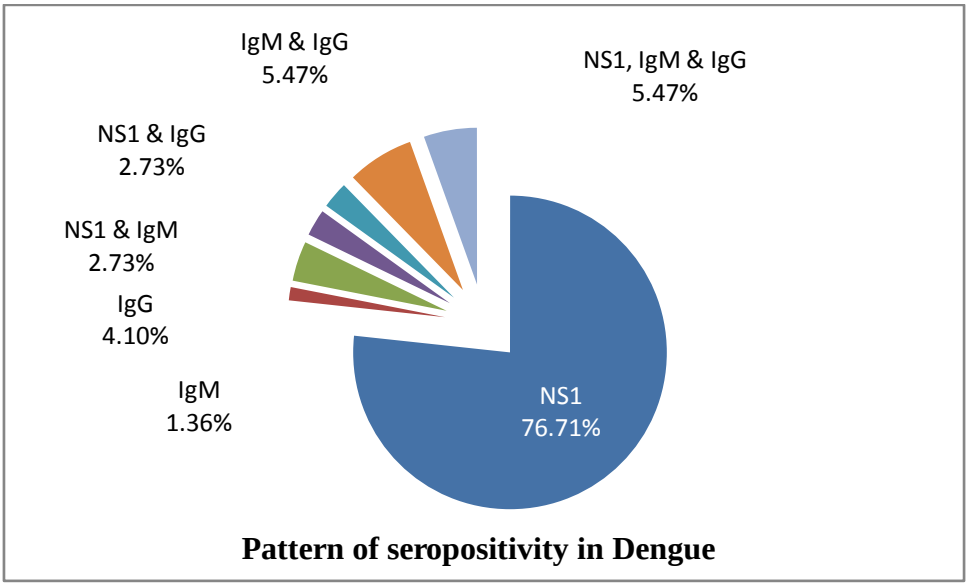

Figure 1 : Pattern of Seropositivity in dengue fever

The commonest presenting clinical symptoms in patients are fever (in all patients, 100%), followed by severe headache, Nausea/Vomiting and Fatigue. The other common symptoms include Backache, Myalgia, Anorexia and pruritus. The bleeding manifestations were found in 14 patients (9.58%) which includes Gum bleeding, Hematuria, Hematemesis and Malena. (Table 2)The complications have been found in 45 patients (30.82%) which include Pleural effusion, Hypotension, Pneumonia, Cholecystitis, ARDS, Renal failure, Encephalopathy, and Multi-organ failure. (Table 2)

Table 2 : Distribution of clinical manifestations and complications of Dengue fever (n=146)

Symptoms	No. of patients	Percentage (%)
Fever	146	100
Headache	110	75.34
Backache	50	34.24
Myalgia	48	32.87
Anorexia	20	13.69
Nausea/Vomiting	84	57.53
Abdominal pain	38	26.02
Fatigue	68	46.57
Pruritus	4	2.73
Retro-orbital pain	18	12.32
Joint pain	20	13.69
Epistaxis	4	2.73
Gum bleeding	2	1.36
Hematuria	3	2.05
Hematemesis	3	2.05
Malena	2	1.36
Complications		
▪ Dengue with Pleural effusion	20	13.69
▪ Dengue with Hypotension	8	5.47
▪ Dengue with Pneumonia	6	4.10
▪ Dengue with Cholecystitis	3	2.05
▪ Dengue with Renal failure	2	1.36
▪ Dengue with ARDS	2	1.36
▪ Dengue with Encephalopathy	2	1.36
▪ Dengue with Multi-organ failure	2	1.36

Out of 146 cases reviewed, patients with anemia were observed very less. Leukopenia was found more than leukocytosis. Other laboratory findings are illustrated in Table 3

Table 3 : Distribution of laboratory investigations in Dengue fever

Lab test	No. of Patients	Percentage (%)
Hemoglobin (<10)	6	4.10
Hematocrit (>40)	84	57.53
Leukocytosis	16	10.95
Leukopenia	64	43.83
Platelet <100000	126	86.29
SGOT (>40 u/l)	40	27.39
SGPT (>40 u/l)	36	24.65
Deranged RFT	2	1.36

Table no 4 illustrates that 33.33% of bleeding manifestations were seen in patients with platelet count <20,000 cells/cumm and 10.34% with platelet count between 20000 to 50000 cells/cumm. So there was significance difference found in between bleeding manifestations and thrombocytopenia.

Table 4 : Correlation of bleeding manifestations with Thrombocytopenia

Platelet count	<20,000 (n=12) (Severe)	20000-50000(n=58) (Moderate)	50000-100000 (n=56) (mild)
Bleeding manifestations	4 (33.33%)	6 (10.34%)	4 (7.14%)
Without Bleeding manifestations	8 (66.66%)	52 (89.65%)	52 (92.85%)

IV. Discussion

Dengue is an important emerging disease of the tropical and sub-tropical regions today. Since the first confirmed case of dengue in India, during the late 1940s.[13]In the present study maximum number of patients were admitted in the rainy season (August to October) that is related to favourable conditions for growth of vector Aedesaegypti.[14]Transmission of dengue increases during monsoon.[4]the correlation between occurrence of dengue and monsoon is clearly evident in this study and previous studies conducted.[13] In the present study maximum number of patients who suffered were in the age group between 20-30 years, Our findings were related with Doke et al, as maximum number of patients occurred in age group 15-44 years.[15] The male to female ratio is found to 1.7:1, the study conducted by ashwini kumar et al reveals similar ratio 1.8:1.[13]where as another study showed slight difference in ratio was 1.3:1 by anagha G kinikar et al.[16] Almost all the studies had male preponderance among affected individuals.

In our present study, NS1 antigen reactive patients found more in number when compared to seropositive IgM and IgG antibody patients. A similar study was conducted by Anugha G. Kinikar et.al shows alike results.[16]

The clinical profile of dengue shows that fever was the most common presenting symptom in 146 (100%) patients. Abdominal symptoms/signs such as abdominal pain, nausea/vomiting, anorexia, abdominal tenderness, hepatomegaly and splenomegaly were found to be present 83.55% of study population which shows identical result statistically[13] where as another study was conducted by Satya sudhish Nimmagadda which shows less number of patients are affected with abdominal symptoms.[17] In the present study, the other symptoms which were found frequently such as headache followed by fatigue, myalgia and backache whereas Mavilla anuradha et al, shows frequently affected symptoms in their study population are myalgia followed by headache, vomiting etc.[14]which shows vise- verse result but M. Neeraja et al, reported similar frequency of all symptoms related to our study.[18] Retro-orbital pain was observed in 12.32% of patient whereas Denys Eiti Fugimoto was reported 16.1% of patients.[19]

Bleeding manifestations were revealed in 9.58% of patients while Ashwini Kumar et al, reported in 26.6%[13] and Tejashree .A et al, were reported in 3.84% of patients.[20]

Our study shows pleural effusion was found in 13.69% patients where other study displayed ARDS (33.33%) as a significant complication [13] but our study revealed that ARDS was found to be least. Other complications such as renal failure and encephalopathy, each was observed in 1.36% patients in our study whereas other study shows renal failure and encephalopathy was found in 40.6% and 0.66% patients respectively. So both study shows that encephalopathy was associated very rare compared to renal failure. In our study, Hypotension was observed in 8 (5.47%) of patients but no death was found whereas other study was reported 3 deaths due to hypotension in seropositive patients.[17] A similar study was conducted by Ashwini kumar et al, shows statistically significant result as our study in complications of pneumonia, renal

failure and multi-organ failure.[13] The laboratory investigations are evaluated in our study, the finding shows that anemia was associated in least patients compare to other study was conducted by Tejushree .A et al. which shows significant difference in both study.[20] Increased hematocrit was observed in 57.53% of patients whereas Mavilla Anuradha et al, were reported in 30.00% of patients. 126 (80.29%) patients had platelet count < 100000 cells/cumm but Rashmi K.S et al reported 72.77% of patients had platelet count <100000 cells/cumm. So our study reflected that more patients are encountered with thrombocytopenia.[21] Leukopenia was observed in 43.83% of patients whereas Prafulla Dutta et al, were reported 30.00% of patients presented with leukopenia.[22] Leukopenia was mainly found in NS1 seropositive patients.Liver enzymes like AST was found in 1/4th of study population whereas Prafulla Dutta et al, were reported in 1/3rd of study population[22] and ALT were in 1/4th of study population whereas other study shows half of the patients.[14] So AST and ALT was less affected in the region of central Karnataka. Table 4 illustrates the correlation between bleeding manifestation and thrombocytopenia in our study whereas Satya Sudish Nimmagada et al, were reported correlations between bleeding manifestations and thrombocytopenia but in both study shows no significant difference in bleeding manifestations and platelet count <20000 cells/cumm but there was significant difference was found in bleeding manifestations and platelet count 20000 to 50000 cells/cumm in two studies.[17] The various factors were responsible for thrombocytopenia such as platelet dysfunction, consumption coagulopathy and endothelial dysfunction which are not related to severity of bleeding. The patients were also investigated for other causes of fever endemic in our region such as malaria, typhoid and leptospirosis which causes the thrombocytopenia and often lead to delay in diagnosis of dengue. No deaths were found in our prospective study.

After comparing different studies, it can be deduced that clinical presentation of dengue varies from region to region.

V. Conclusion

Dengue fever is an important public health problem in tropical countries like India. It can present with varied clinical manifestations. Early recognition and prompt management is essential to reduce the morbidity and mortality associated with dengue.

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