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To Determine the Clinical, Immunological & Biological Parameters in the Diagnosis of Dengue Fever in Clinically Dengue Suspected Patients

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ABSTRACT

Background: The dengue is a human viral pathogen, which is basically mosquito borne, affecting about 2.5 billion people in tropical and sub-tropical regions of the world. The present study was done to determine the common clinical features, immunological & biological parameters in the diagnosis of dengue fever in clinically suspected patients.

Materials & Methods: This study was carried out in the Department of Microbiology, Vydehi Institute of Medical Sciences and Research Centre, Bangalore, Karnataka over a period of 18 months from January, 2016 to June, 2017. The study was conducted among 100 patients, clinically suspected for Dengue who were screened for Dengue. The collected data was entered into MS excel followed by the analysis using SPSS version 21.

Results: In our study, we noted that, out of 100 dengue suspected cases, 45 patients (45%) were in the age group from 20-30 years, followed by 21 patients in the age group of 30-40 years. The mean age of Males & Females were 35 & 29 years respectively. 70% patients were males and 30% were females. Out of total of 100 patients, Fever was the commonest symptom followed by headache. In our study, out of 100 patients, 32 had low AST levels, 31 had high AST levels. The platelets counts were low for 61 patients. 36 had low ALT levels, 2 had high ALT levels. 91 came out to positive by rapid card test and 9 came out to be dengue negative. 91 were positive for dengue and 9 came out to be dengue negative.

Conclusion: The present study concluded that maximum patients were in the age group from 20-30 years and dengue was prevalent in males than females. Fever was the commonest symptom. 32 had low AST levels, 31 had high AST levels. The platelets counts were low for 61 patients. 36 had low ALT levels, 2 had high ALT levels. 91 came out to be positive by rapid card test and 9 came out to be dengue negative. 91 were positive for dengue and 9 came out to be dengue negative.

Keywords: ELISA, AST, ALT, Myalgia, Sero-diagnosis.

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INTRODUCTION

Dengue, which is also known as classic dengue or break bone fever, is a flaviviral infection found in large areas of tropical and subtropical regions of the world.[1] Dengue is caused by infection with one of the four serotypes of dengue viruses (DEN 1-4), which are arboviruses belonging to the flaviviridae family, and are transmitted by the bite of mosquito, principally Aedes aegypti.[2] A cyclical trend is observed for dengue infection, with a peak in September- October every year.[3]

An estimated 50 million dengue infections occur annually throughout the world and approximately 2.5 billion people are living in dengue endemic countries.[4,5] Dengue is the most rapidly spreading viral disease in the world with an increase in incidence of 30 folds in the last 50 years.[5,6] Dengue fever is characterized by high grade fever, headache, myalgia and arthralgia, retro orbital pain and skin rashes. Some patients also show petechiae, bruising or thrombocytopenia. The characteristic features of Severe dengue are plasma leakage, hemo concentration, hemorrhagic shock and multiple organ failure leading to death.[7] Platelet count is the only accessory laboratory test available in the peripheral areas.[8] Liver damage is a common complication of dengue infection and serum amino transferase levels are a valuable marker of monitoring dengue cases.[9] The precise diagnosis of Dengue can be achieved through viral isolation, viral RNA detection through RT-PCR or by the detection of dengue specific antigen or antibodies.[4] As the 1st two methods are time consuming, costly and not within the reach of most of the tertiary care centers, its diagnosis is based on the detection of dengue specific antibodies and/or NS1 antigen.[10]

According to the guidelines of national vector borne disease control programme (NVBDCP), IgM antibody capture ELISA should be considered as diagnostic test for dengue infections.[11,4] In the early stages of Dengue infection, Viral nonstructural (NS1) antigen is abundant in the serum of patients, lasting from 1 to 9 days; therefore,NS1 antigen ELISA, especially when used together with a IgM capture ELISA, is sufficiently informative in an endemic setting.[8]

Hence this study was done to determine the common clinical features, immunological & biological parameters in the diagnosis of dengue fever in clinically suspected patients.

MATERIALS & METHODS

This prospective, cross-sectional study was carried out in the Department of Microbiology, Vydehi Institute of Medical Sciences and Research Centre, Bangalore, Karnataka over a period of 18 months from January, 2016 to June, 2017. This study was conducted among 100 patients, who were clinically suspected for Dengue and screened for AST (SGOT), ALT (SGPT) & Platelet Counts. All the patients with fever, rashes, myalgias, joint pain, headache, retro orbital pain & other associated signs/symptoms were included in the study. Patients without clinical signs/symptoms of dengue, patients with fever & related symptoms but due to some other diagnosed etiology like Typhoid fever, malaria, ITP, etc were excluded from the study. Under aseptic precautions, a minimum of 5ml of blood sample was collected from patients (OPD/IPD) having clinical suspicion of Dengue. By process of centrifugation, the serum was separated from blood and stored at -20ºC. All the serum samples were tested using ELISA and rapid ICT card test and were also subjected for testing of hematological parameters like Platelet Count and liver enzymes (AST & ALT). The collected data was entered into MS excel followed by the analysis using SPSS version 21(Licensed to VIMS & RC). The demographic variables were represented using Arithmetic Mean, Standard deviation (SD), percentages and pie diagrams. The Clinico-Serological Parameters were depicted in the form of a multiple bar diagram.

RESULTS

In our study, we noted that, out of 100 dengue suspected cases, 45 patients (45%) were in the age group from 20-30 years, followed by 21 patients in the age group of 30-40 years, followed by 15 patients (15%) were in the age group from 10 to 20 years, which shows that the young adult population(Youths) were mostly affected followed by the early middle aged, followed by the Adolescents and the teenage population. The mean age of Males & Females were 35 & 29 years respectively. 70% patients were males and 30% were females.

Out of total of 100 patients, Fever was the commonest symptom and was seen in all 100 patients. Headache was seen in 76 patients, Myalgia in 68 patients, Retro orbital pain in 49 patients, Jaundice was seen associated with 47 patients, vomiting in 12 patients, abdominal pain in 9 patients, shock was seen as a complication of Dengue in 2 patients. The total may not round off to 100%, as many patients had multiple symptoms. In our study, out of 100 patients, 32 had low AST levels, 31 had high AST levels, and 37 had normal AST levels. In our study, out of 100 patients, 36 had low AST levels, 2 had high AST levels, and 62 had normal AST levels. The platelets counts were low for 61

patients and were normal for 39 patients. Out of total 100 samples, 91 came out to be positive by rapid card test and 9 came out to be dengue negative. Out of 100 samples, 91 were positive for dengue and 9 came out to be dengue negative.

Table 1: Age wise distribution of total number of study cases

Age Group	Total No. of Cases	Percentage
1 Day-365 Days (Neonates & Infants)	1	1%
1-10 Years	1	1%
11-20 Years	15	15%
21-30 Years	45	45%
31-40 Years	21	21%
41-50 Years	5	5%
51-60 Years	10	10%
61-70 Years	2	2%
71-100 Years	0	0%
Total	100	100%

Table 2: Mean age of Males & Females in the Study

Group	Mean	SD
Males	34.90	12.27
Females	29.47	13.32

Table 3: The total percentages of males & females in our study

Group	Frequency	%
Males	70	70
Females	30	30

Table 4: AST values of the study subjects

	Frequency	Percent
High	31	31.0
Low	32	32.0
Normal	37	37.0
Total	100	100.0

Table 5: ALT values of study subjects

	Frequency	Percent
High	2	2.0
Low	36	36.0
Normal	62	62.0
Total	100	100.0

Table 6: Platelet Count

	Frequency	Percent
Low	61	61.0
Normal	39	39.0
Total	100	100.0

Table 7: Rapid Card test and ELISA

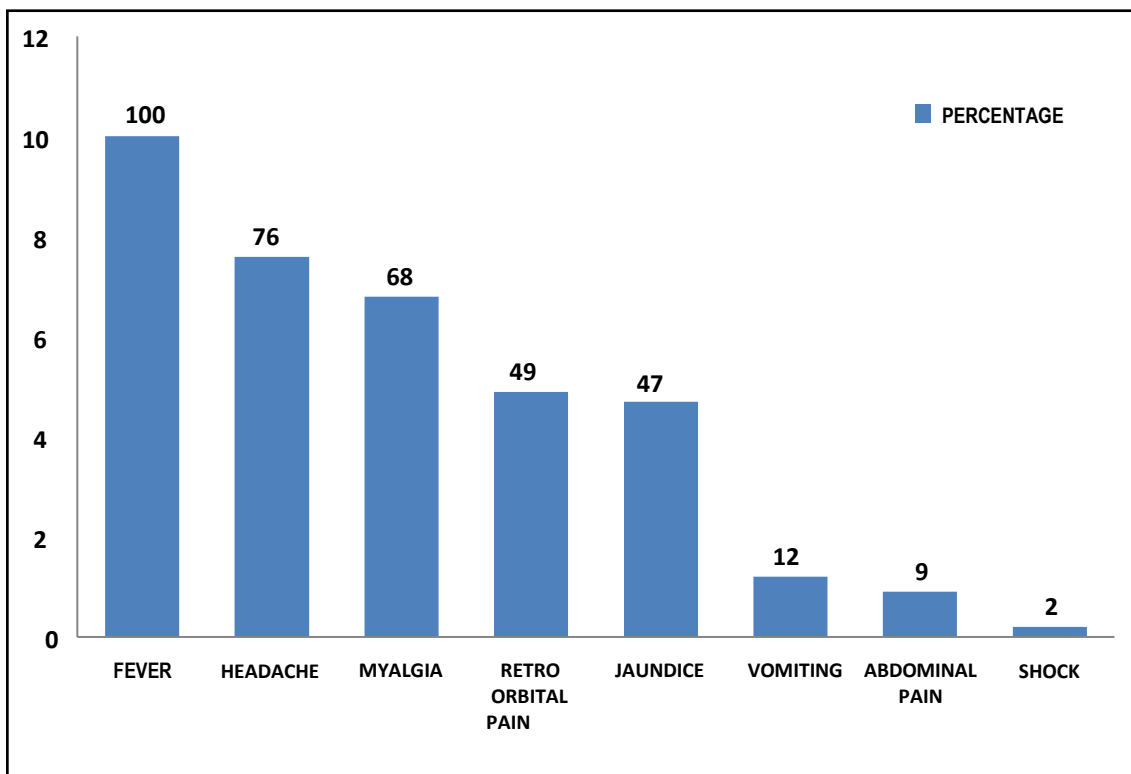|		ELISA		Total
		Positive	Negative	
Rapid Test	Positive	88	3	91
	Negative	3	6	9
Total		91	9	100

Figure 1: Clinical manifestations in percentages

DISCUSSION

Early detection of severe cases, case confirmation and differential diagnosis is of primary importance for clinical care in effective and accurate diagnosis of dengue.[12] Liver dysfunction is a common feature of dengue and SGOT is usually higher than SGPT.[13]

Virus isolation, molecular diagnosis using reverse transcriptase polymerase chain reaction (PCR) and serological methods have been used for laboratory confirmation of dengue infection. Although PCR is a useful tool for identification and dengue strain characterization, its widespread use for diagnosis of dengue infection is limited due to high cost, especially in developing countries.[2]

In our study, we noted that, out of 100 dengue suspected cases, 45 patients (45%) were in the age group from 20-30 years, followed by 21 patients in the age group of 30-40 years, followed by 15 patients (15%) were in the age group from 10 to 20 years, which shows that the young adult population(Youths) were mostly affected followed by the early middle aged, followed by the Adolescents and the teenage population. The mean age of Males & Females were 35 & 29 years respectively.

In our study, out of 100 patients who were clinically suspected for dengue infection, 70% were males and 30% were females. Similar studies conducted by Singh R.et al[14] showed Male preponderance of 57.1% as compared to females (42.9%). However, another study conducted by Bhaskar I, et al,[9] showed female preponderance of 56% as compared to males (44%).

In our study, out of all the 100 clinically dengue suspected cases, all of them (100%) had fever as the commonest clinical manifestation, followed by Headache (76%), Myalgia (68%), Retro orbital pain (49%), Jaundice (47%), Vomiting (12%), and other symptoms like abdominal pain, shock, etc. A similar type of clinical manifestations was seen in the study conducted by Begum T.M, et al[7] where they found fever as the commonest clinical manifestation and was seen in all their subjects (100%) followed by headache and myalgia. In our study, out of 100 patients, 61 had low platelet counts (<150,000/mm³) and 39 patients had normal platelet count. This prevalence of Thrombocytopenia of 61% was lower when compared to the prevalence seen in the studies conducted by Kulkarni R.D, et al[10] showing 68.75%. But our prevalence of Thrombocytopenia was higher when compared to Begum T, et al[7] of 55.03%. In our study, 10(16.39%) out of 61 thrombocytopenic patients had a platelet count of less than 50,000/mm³ and among which only 2 patients developed dengue shock syndrome. In our study, out of 100 patients, 32 patients had low AST values, 31 had high AST and 37 had normal AST. Similarly for ALT, out of 100 patients, 36 had low ALT, 2 had high ALT and 62 patients had normal ALT. The levels of AST were higher than ALT levels, which were also seen in a study done by Begum T.M, et al[7] and also in a study done by Bhaskar I, et al[9].

Out of total 100 samples, 91 came out to be positive by rapid card test and 9 came out to be dengue negative. Out of 100 samples, 91 were positive for dengue and 9 came out to be dengue negative. A study conducted by Begum T.M, et al showed the sensitivity and specificity of Rapid test of 66.24% and 90.14% respectively when compared to ELISA.[4]

CONCLUSION

The present study concluded that maximum patients were in the age group from 20-30 years and dengue was prevalent in males than females. Fever was the commonest symptom. 32 had low AST levels, 31 had high AST levels. The platelets counts were low for 61 patients. 36 had low ALT levels, 2 had high ALT levels. 91 came out to be positive by rapid card test and 9 came out to be dengue negative. 91 were positive for dengue and 9 came out to be dengue negative.

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