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Original Research Article

Screening of Dengue Fever in Clinically Suspected Cases in a Tertiary Care Hospital, Nellore, Andhra Pradesh, South India

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Abstract: Dengue fever is one of the most serious mosquito- borne Arboviral infections affecting tropical and subtropical countries in the world. Due to lack of immune prophylaxis and specific anti-viral therapy, outbreaks occur almost every year. There is a need for rapid diagnosis to prevent morbidity and mortality. The study was conducted to know the seroprevalance of dengue virus in a tertiary care hospital, Nellore. Blood samples received in microbiology laboratory from suspected dengue cases during June 2015 to October 2015 were serologically analyzed. NS1 Antigen, IgG and IgM antibodies were detected employing Dengue Day 1 Test kit (J.Mitra & Co. Pvt Ltd) by solid phase immunochromatographic method. Among the samples collected, 88.69% were positive for NS1 antigen, 3.41% for IgM and 2.77% for IgG. Thrombocytopenia was observed in 71.42% cases, highest being in those positive for NS1 antigen only (301 cases). Combination of antigen and antibody assays on single serum sample, ease and time taken by Immunochromatography test makes it preferable test of choice for making a reliable diagnosis**.**

Keywords: Dengue, Immunochromatography, NS1 Antigen, Serological markers, Thrombocytopenia, Nellore.

INTRODUCTION

Dengue is an acute potentially fatal Arboviral infection which can culminate into Dengue Hemorrhage Fever (DHF) and Dengue Shock Syndrome (DSS). It is caused by any one of the serotypes (DEN -1, DEN-2, DEN-3, DEN-4, DEN-5?) [1]. Detection of Dengue specific IgM/ IgG has been the mainstay of diagnosis of Dengue Infection (DI). Recently, Non- Structural Protein 1 (NS1 Ag) detection is available for the diagnosis of DI which is sensitive and highly specific [2]. Apart from these specific markers, thrombocytopenia (<1, 00,000/ml) is found between 3rd and 8th day of illness [3, 4].

MATERIALS AND METHODS

The present study was conducted in Narayana Medical College and Hospital (tertiary care hospital) from June- October 2015. Ethical Committee clearance was obtained for the study. Clinically suspected cases of dengue fever with complaints of fever, headache, malaise, myalgia, arthralgia, maculopapular rash.

A total of 1054 blood samples were aseptically collected from patients with suspected dengue fever by taking universal precautions. Serum was separated and processed using Dengue Day 1 Test (immunochromatography – based test) detecting NS1 Antigen, IgM and IgG antibodies as per the manufacturer's instructions (J.Mitra and Co. Pvt. Ltd, New Delhi, India). Platelet counts of all the positive cases for any one of the dengue serological markers were also noted

RESULTS

Table-1: Distribution of Total Samples

Samples	Number	Percentage (%)
Positive samples	469	44.49%
Negative samples	585	55.50%
Total	1054	100%

Table-2: Monthly Distribution of Positive Cases

Month	Positive Cases	Percentage %
June	9	1.91
July	11	2.34
August	73	15.56
September	104	22.17
October	272	57.99
Total	469	100

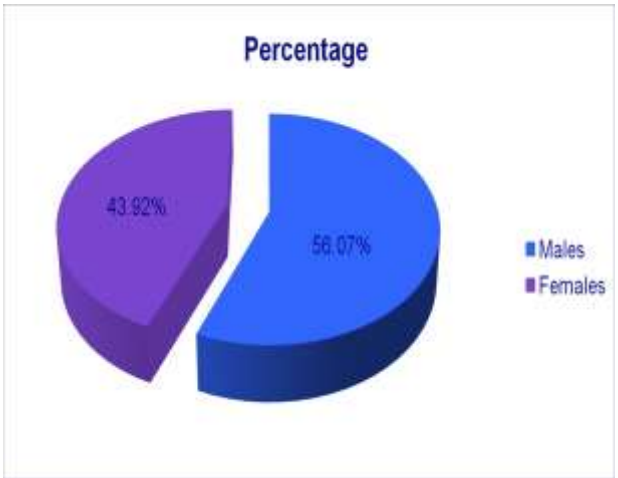

Fig-1: Gender Distribution

Table-3: Age – Wise Distribution

Age group	Number	Percentage %
0-10 years	80	17.05
11-20 years	102	21.74
21-30 years	105	22.38
31-40 years	68	14.49
41-50 years	60	12.70
51-60 years	29	6.18
61-70 years	12	2.55
71-80 years	12	2.55
81-90 years	1	0.21
Total	469	100

Table-4: Dengue Serological Markers in Diagnosis of Dengue Fever

Component	Number	Percentage (%)
NS1 antigen	416	88.69
IgM only	16	3.41
IgG only	13	2.77
NS1 Antigen and IgM	10	2.13
NS1 Antigen and IgG	4	0.85
IgM and IgG	8	1.70
NS1 Antigen, IgM and IgG	2	0.42
Total	469	100

Table-5: Correlation of Serological Markers with Platelet Counts

Serological markers	Positive cases	Positive samples with platelet count <1,00,000/ml	Percentage (%)
NS1 antigen only	416	301	72.35
NS1 Ag + IgM	10	9	90
NS1 Ag + IgG	4	2	50
NS1 Ag + IgM + IgG	2	0	0
IgG only	13	11	84.61
IgM only	16	7	43.75
IgG + IgM	8	5	62.5
Total	469	335	71.42

DISCUSSION

In the present study, out of 1054 samples collected, 469 were positive with a positivity of 44.49%. This high number of positivity is correlated with the findings in studies done by Srinivas Rao *et al*. (53.2%) [5] and Krunal. P. Mehta *et al*. (52.2%). Studies done by Saroj Golia *et al*. [11] and Santosh S.T *et al*. have positivity rates of 25.46% and 39.41% respectively. In contrarily, Kulkarni RD *et al*. [2] reported 15.20% positivity.

In the present study, Dengue was found more in males (56.07%) than females (43.92%) with M: F being 1.27:1. Quader A.J *et al*. [7] also found similar findings with M:F being 1.04:1. Even Mehta *et al*. (72%) and PM Ukey *et al*. (68.29%) [8] reported Dengue more common in males.

Majority of the cases in this study were of the age group 21- 30yrs (22.38%) which is in correlation other studies by Mehta *et al*. (16-30yrs; 49%). Quader A.J *et al*. (20-30yrs; 42%), PM Ukey *et al*. (15-30yrs; 31.71%), Ravichitra *et al*. (17-30yrs; 34.4%) [9].

Out of the 469 cases positive for Dengue Fever, majority were positive for NS1 Ag [416 (88.69%)] which is similar to the findings in studies by Bhaswati Bandyopadhyay *et al*. (61.29%) [10] and Santosh *et al*. (36.55%). Though these finding were in discordance with the reports by Saroj Golia *et al*. [11]

and Quader A.J *et al*. where majority were IgM – 33.3% and IgG 39.8% respectively.

Thrombocytopenia was found in 71.42% of the seropositive cases. The finding is in concordance with studies done by Saroj Golia *et al*. (72.22%), Santosh *et al*. (81.72%), and Kulkarni *et al*. (68.8%). Thrombocytopenia was highest in patients with NS1 Ag + IgM (90%) correlating with findings reported by Kulkarni *et al*. (94.1%) and Santosh *et al*. (88.23%).

CONCLUSION

Of the 1054 cases tested for Dengue NS1 Antigen, IgM and IgG antibodies by immunochromatography method, 469 cases (44.49%) tested positive for Dengue Fever indicating high prevalence of Dengue in this area. Cases increased over the months from June to October with maximum cases in the month of October. There was a male preponderance in the seropositives (56.07%). Dengue was most common in age group of 21-30yrs (22.38%). Among the 469 positive Dengue cases, 416 (88.69%) were positive for NS1 Ag, 16 were positive for IgM only and 13 were positive for IgG only. Thrombocytopenia was detected in 335 cases (71.42%) with highest being in those patients positive for NS1 Ag only (301 cases; 72.35%).

The ease and time taken by immunochromatography test, makes it an excellent tool for early diagnosis in peripheral areas. NS1 positive and IgM positive result by immunochromatographic test in a patient with dengue like symptoms in endemic regions can be inferred as suggestive of dengue infection.[12] Surveillance is highly required for monitoring Dengue outbreaks. A seasonal trend observed, stresses the importance of initiation of preventive and control measures prior to monsoon to prevent outbreaks

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