Journal of Advanced Medical and Dental Sciences Research

@Society of Scientific Research and Studies

Journal home page: www.jamdsr.com doi: 10.21276/jamdsr Index Copernicus value = 85.10

(e) ISSN Online: 2321-95 (p) ISSN Print: 2348-6805

Original Research

Clinico-microbiological findings of dengue fever

Ashok Kumar

Assistant Professor, Department of Microbiology, Narayan Medical College and Hospital, Rohtas, Bihar, India

ABSTRACT:

Background: Dengue is an arboviral disease caused by infection with any one of four related dengue virus (DENV) serotypes.The present study was conducted to assess clinico-microbiological findings of dengue fever. **Materials & Methods:** 84 patients of dengue viral infection of both genders were enrolled. Evaluation of NS1 antigen, IgM and IgG antibodies was done. NS1 antigen and IgM antibodies using ELISA methodand IgG antibodies were detected using lateral flow assay. **Results:** Out of 84 patients, males were 54 and females were 30. Common symptoms recorded were headache in 57, retro orbital pain in 26, myalgia in 42, arthralgia in 38, rash in 62 and bleeding in 43 patients. A significant difference was observed (P<0.05). NS1 was identified in 42%, IgM in 23%, IgG in 4%, NS1+ IgM in 20%, NS1+ IgG in 4% and NS1+ IgM+ IgG in 7%. A significant difference was observed (P< 0.05). **Conclusion:** In maximum cases, NS1 was identified followed by NS1+ IgM.

Key words: dengue, NS1, viral infection

Received: 17 March, 2018 Accepted: 22 April, 2018

Corresponding author: Ashok Kumar, Assistant Professor, Department of Microbiology, Narayan Medical College and Hospital, Rohtas, Bihar, India

This article may be cited as: Kumar A. Clinico-microbiological findings of dengue fever. J Adv Med Dent Scie Res 2018;6(5):127-129.

INTRODUCTION

Dengue is an arboviral disease caused by infection with any one of four related dengue virus (DENV) serotypes. It is currently the most important mosquito-borne viral pathogen affecting humans, and is emerging as a major threat to global health.[1] Best estimates indicate that some 3 billion people live in parts of the world where they are at risk of infection and that around 96 million symptomatic episodes and approximately 20,000 deaths occur each year.[2]

Outbreaks caused by the four types of dengue virus - DENV1, DENV2, DENV3 and DENV4 - have become increasingly frequent over the past 25 years. Individuals infected with one strain maintain lifelong homotypic immunity while remaining susceptible to infections with other heterotypic strains as no cross-immunity is provided by infection with one strain.[3] Distinct genotypes have been identified within each serotype, highlighting the extensive genetic variability of the dengue serotypes. About 55% of the world's population lives in areas where there is a risk of dengue fever.[4]Careful observation, assessment and sensible use of intravenous fluid therapy are critical, with urgent shock resuscitation required in only a small proportion of cases. However, a major issue for clinicians treating such patients remains the fact that clinical diagnosis of dengue is difficult in the early febrile phase of the illness without reliance on expensive diagnostics.[5]The present study was conducted to assess clinico-microbiological findings of dengue fever.

MATERIALS & METHODS

The present study comprised of 84 patients of dengue viral infectionof both genders. The consent was obtained from all enrolled patients.

Data such as name, age, gender etc. was recorded. Assessment of clinical features such as headache, retro orbital pain, myalgia, arthralgia, rash, hemorrhagic manifestations and leucopenia was recorded. Evaluation of NS1 antigen, IgM and IgG antibodies was done. NS1 antigen and IgM antibodies using ELISA methodand IgG antibodies were detected using lateral flow assay.Data thus obtained were subjected to statistical analysis. P value < 0.05 was considered significant.

RESULTS

Table I Distribution of patients

Total- 84		
Gender	**Male**	**Female**
Number	54	30

Table I shows that out of 84 patients, males were 54 and females were 30.

Table II Assessment of clinical findings

Clinical symptoms	Number	P value
headache	57	0.05
retro orbital pain	26	
myalgia	42	
arthralgia	38	
rash	62	
bleeding	43	

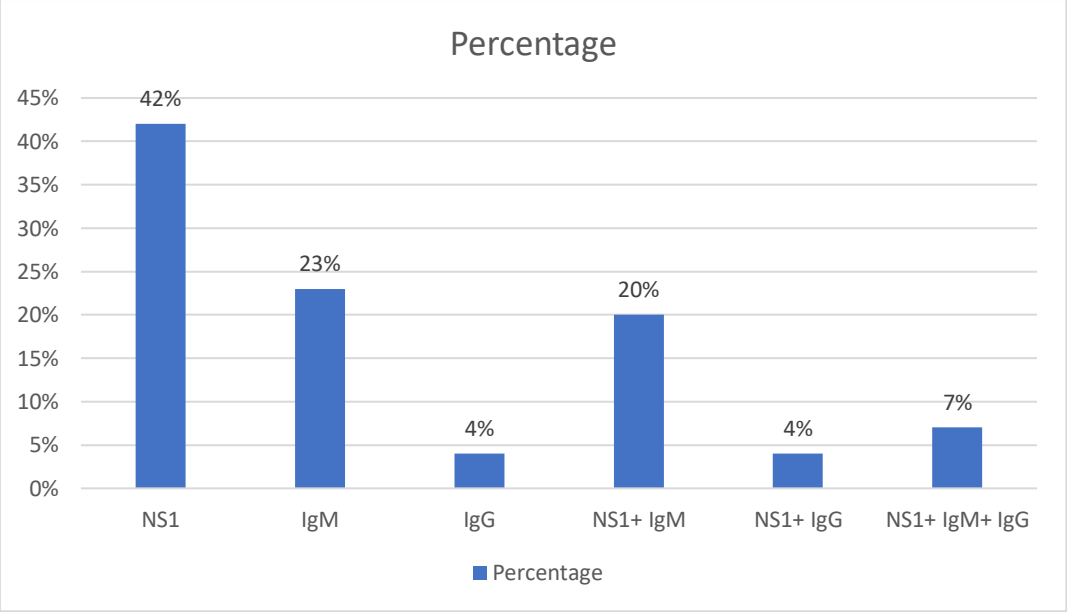
Table II shows that common symptoms recorded were headache in 57, retro orbital pain in 26, myalgia in 42, arthralgia in 38, rash in 62 and bleeding in 43 patients. A significant difference was observed (P<0.05).

Table III Serological distribution

Serological findings	Percentage	P value
NS1	42%	<0.05
IgM	23%	
IgG	4%	
NS1+ IgM	20%	
NS1+ IgG	4%	
NS1+ IgM+ IgG	7%	

Table III, graph I shows that NS1 was identified in 42%, IgM in 23%, IgG in 4%, NS1+ IgM in 20%, NS1+ IgG in 4% and NS1+ IgM+ IgG in 7%. A significant difference was observed (P< 0.05).

Graph I Serological distribution



DISCUSSION

It is estimated that more than 3.6 billion people are at risk of infection and 124 countries have endemic dengue virus transmission.[6] Out of these, nearly 70-500 million people are infected annually. These include the asymptomatic cases. Cases of dengue fever per year are 36 million.[7] About 2.1 million cases of Dengue Haemorrhagic Fever (DHF) and Dengue Shock Syndrome (DSS), constituting 5-10% of the total cases, are reported annually although the true incidence is not really known.[8] At least 21,000 deaths occur, mainly among children, per year.[9]The present study was conducted to assess clinico-microbiological findings of dengue fever.

We found that out of 84 patients, males were 54 and females were 30. Ghosh et al[10]determined the socio

demographic status of suspected dengue. Distribution in 320 positive samples were NS1 positive 51.56%, IgM positive 22.81%, IgG positive 12.2%, NS1 + IgM positive10.31%, IgM + IgG positive 2.19% and NS1 + IgM + IgG positive 0.93%.In 100 randomly selected ICT positive cases, there was a gain of 6 (3+3) positive samples by the NS1 Microlisa test as compared to the NS1 immuno chromatography test. In 66 ICT positive samples, there was a gain of 7 (2+5) positive samples by IgM Microlisa and a gain of 1 sample by IgG Microlisa. Out of 30 samples subjected to RT-PCR, all 15 positive Microlisa samples were positive, while 4 out of 15 Microlisa negative samples were positive by the RT-PCR. Overall, there was a gain of 4 positive samples by the RTPCR. As we found RT-PCR to be the gold standard, sensitivity and specificity of NS1 ICT were found to be 91.2% and 78.4%, while that of NS1 ELISA were found to be 75% and 88%. For the early diagnosis of dengue infection, Immuno chromatography test is a good screening test with good sensitivity

We found that common symptoms recorded were headache in 57, retro orbital pain in 26, myalgia in 42, arthralgia in 38, rash in 62 and bleeding in 43 patients. Sharma et al[11] found that among 667 patients enrolled, 328 (49.2%) had prolonged hospitalization. The mean hospital stay was 4.88±2.74 days. It was found that dengue hemorrhagic fever, elevated alkaline phosphatase (ALP), prolonged prothrombin time (PT), activated partial thromboplastin time (aPTT) and multiple-organ dysfunctions were independently associated with prolonged hospitalization. Overall case fatality rate was 1.1%. Factors associated with dengue mortality were age >40 years, secondary infection, comorbidities, acute kidney injury, prolonged PT, multiple-organ dysfunctions, hematocrit>20%, rhabdomyolosis and respiratory failure.

We found that NS1 was identified in 42%, IgM in 23%, IgG in 4%, NS1+ IgM in 20%, NS1+ IgG in 4% and NS1+ IgM+ IgG in 7%. Chakravarti et al[12]have reported thatdengue outbreak coincided mainly with the postmonsoon period of subnormal rainfall. The differencebetween serologically positive cases as compared toserologically negative ones in post monsoon periodwas significantly higher ($p<0.001$).Their studyhighlighted rain, temperature and relative humidity asthe major and important climatic factors, which couldalone or collectively be responsible for an outbreak.

CONCLUSION

Authors found that in maximum cases, NS1 was identified followed by NS1+ IgM.

REFERENCES

1. Mehandale SM, Risbud AR, Rao JA, Banerjee K. Outbreak of dengue fever in rural areas of Parbhani district of Maharashtra (India). Indian J Med Res 1991; 93: 6-11.
2. Teixeira MG, Costa MCN, Guerra Z, Barreto ML. Dengue in Brazil: situation-2001 and trends. Dengue Bull 2002; 26: 70-6.
3. Jaenisch T, Tam DT, Kieu NT, Van Ngoc T, Nam NT, Van Kinh N, Yacoub S, Chanpheaktra N, Kumar V, See LL, Sathar J. Clinical evaluation of dengue and identification of risk factors for severe disease: protocol for a multicentre study in 8 countries. BMC infectious diseases. 2016 Dec;16(1):1-1.
4. Holly R Hughes, Wayne D CrillandGwong-Jen J Chang. Manipulation of immunodominant dengue virus E protein epitopes reduces potential antibody-dependent enhancement. Virology Journal, 2012; 9:115.
5. J RCL, MZ R, MR MC, MI FG, C P. Interpretation of the presence of IgM and IgG antibodies in a rapid test for dengue: analysis of dengue antibody prevalence in Fortaleza City in the 20th year of the epidemic. Rev Soc Bras Med Trop. 2012;45(2):163–170.
6. Jenny G. H. Low, Adrian Ong, Li Kiang Tan, Shera Chaterji, Angelia Chow, Wen Yan Lim. The Early Clinical Features of Dengue in Adults: Challenges for Early Clinical Diagnosis. PLoSNegl Trop Dis, 2011; 5(5): 1191.
7. D Turbadkar, A Ramchandran, M Mathur, S Gaikwad. Laboratory and clinical profile of dengue: A study from Mumbai. Annals of Tropical Medicine and Public Health, 2012; 5: 20-23.
8. R D Kulkarni, S.S. Patil, G S Ajantha, A K Upadhya, A S Kalabhavi, R M Shubhada. Association of platelet count and serological markers of dengue infection-importance of NS1 antigen.Indian Journal Of Medical Microbiology, 2011; 29:4 (359-362).
9. Chua KB, Mustafa B, Abdul Wahab AH, Chem YK, Khairul AH, Kumarasamy V, Mariam M, Nurhasmimi H, Abdul Rasid K.A comparative evaluation of dengue diagnostic tests based on single-acute serum samples for laboratory confirmation of acute dengue., 2011; 33(1):13- 20.
10. Ghosh G, Urhekar AD, Kosta S. AClinico-microbiological study of dengue fever cases in a tertiary care centre of Navi Mumbai. International Journal of Bioassays. 2013 Oct 31;2(11):1462-7.
11. Sharma S and Sharma SK. Clinical profile of dengue haemorrhagic fever in adults during 1996 outbreak in Delhi, India. Dengue Bulletin. 1998; 22: 20-27.
12. Chakravarti and Rajni Kumaria.Eco-epidemiological analysis of dengue infection during an outbreak of dengue fever, India. Virology Journal, 2005; 2:32.