VOLUME-6 | ISSUE-4 | APRIL - 2017 • ISSN No 2277 - 8179 | IF : 4.176 | IC Value : 78.46

Dengue infection in a tertiary care hospital in Navi Mumbai- Prevalence, clinical correlation and seasonal variation.

Microbiology

KEYWORDS: Dengue, Probable Dengue cases,

Dr Anahita Bhesania Hodiwala — Professor, Department of Microbiology, MGM Medical College and Hospital, Navi Mumbai.

Ms Aakansha Tomar — Msc Medical Microbiology student, Department of Microbiology, MGM Medical College and Hospital, Navi Mumbai.

Dr Dipashri Khiste — Assistant Professor, Department of Microbiology, MGM Medical College and Hospital, Navi Mumbai.

ABSTRACT

Dengue is an acute viral infection with potential fatal complications. Dengue has been increasing worldwide over the last few decades, about 2.5 billion people in 200 countries are at risk. The Dengue virus causes significant morbidity and mortality in many parts of the world, including India, where it was first isolated in Calcutta, West Bengal during 1945. Out of 100 Dengue suspected samples tested, 46 were reactive for either NS1 antigen or IgM antibody. Hence the prevalence rate of Dengue cases in our study was 46%. Maximum cases i.e 89% were from Medicine department. Males seemed to be more commonly affected 76% as compared to the females 24% Maximum reactive cases i.e 54% were seen to belong to age group of 21 years to 35 years .Most of the cases occurred in monsoon with maximum cases seen in the months of August and September .Abdominal pain, vomiting, myalgia, and hepatomegaly were commonest symptoms in probable Dengue cases .Hypoalbuminemia was seen to be the commonest complication and the mortality rate was 6.5%. This data is significant since there is no treatment for these infections but early detection and access to proper medical care will cause lower fatality rate.

Introduction:

Dengue is an acute viral infection with potential fatal complications. Dengue fever was first referred as "Water poison" associated with flying insects in a Chinese Medical encylopedia in 992 from the Jin Dynasty (265-420 AD). The word Dengue is derived from the Swahili phrase Ka-dinga pepo, meaning "cramp like seizure".1 Dengue virus (DV) belongs to the family Flaviviridae and genus flavivirus and the most widely prevalent arbovirus in tropical and subtropical regions of Asia, and Central and South America.2 Dengue has been increasing worldwide over the last few decades, about 2.5 billion people in 200 countries are at risk.3 Dengue fever (DF) is a very old disease caused by an arbovirus and transmitted by the bite of an insect vector-Aedes aegypti.4 No vertebrate hosts other than humans have been identified.3 Dengue fever is one of the major tropical disease caused by the Dengue virus. Dengue is generally found in tropical and subtropical climates worldwide, often in urban and semi-urban areas.5 Dengue fever and Dengue Haemorrhagic fever (DF/DHF) is an acute viral disease caused by Dengue virus. The Dengue virus causes significant morbidity and mortality in many parts of the world, including India, where it was first isolated in Calcutta, West Bengal during 1945.6 The first major outbreak associated with Haemorrhagic manifestation occurred in Calcutta city in 1963. According to World Health Organization (WHO), two-fifths of world's population (i.e. 2500 million peoples) are now at risk for Dengue and annually approximately 50 million new cases of Dengue fever (DF) occur worldwide with 500,000 cases of Dengue Haemorrhagic fever (DHF) requiring hospitalization every year and mortality rate of 2.5%.6 There are four antigenically distinct serotypes of the Dengue viruses (DENV 1- 4), DEN-1 isolated from Hawaii in 1944, DEN-2 isolated from New Guinea in 1944, DEN-3 and DEN-4 isolated from Philippines in1956, which produce a spectrum of illness and severe and fatal Dengue Haemorrhagic disease.[3]

Globally, Dengue is the most important arboviral infection of man and the most important tropical disease after malaria[7]

Materials and Methods:

This study was carried out for a period of one year from December 2014-December 2015 at a Microbiology lab in a tertiary care hospital in Navi Mumbai with the aim of finding the prevalence rate of Dengue Viral infection along with clinical correlation and seasonal variation. 100 serum samples received in Microbiology lab from patients clinically suspected of suffering from Dengue fever and symptoms i.e. fever with any of the following -joint pain, rash, myalgia, headache, retro-orbital pain, abdominal pain, hemorrhagic manifestation were included in the study.

Blood samples from clinically suspected cases of Dengue fever were obtained from both outdoor and hospitalized patients .For each patient, name, age, address, occupation, history, clinical exam findings, and laboratory reports were recorded as per the proforma.The clinical proforma was used for grading the patients according to the World Health Organisation (WHO) criteria for Dengue.

Blood samples were collected after taking informed consent from the patients, following the universal precautions and using all aseptic precautions, in the central clinical laboratory or in wards. Sample thus collected were transported immediately to the Microbiology Laboratory for further processing. In case of a delay in processing, they were stored in a refrigerator at a temp. 2-80C. Serum was separated by centrifugation at 3000 rpm for 5 min. on same day of collection. Repeated freezing and thawing of the specimen was avoided. Specimen containing Precipitate or particulate matter were first centrifuged in a centrifuge machine at 3000 rpm for 5 min. then the clear supernatant was used for testing. The use of haemolytic, icteric, lipaemic or bacterially contaminated specimen was avoided as it could lead to erroneous results. All the 100 serum samples were subjected to Dengue Day 1 test following the procedure as per kit literature for detection of IgM , IgG and NS1 antigen. The samples which were reactive for IgM or NS1 antigen were considered as Probable Dengue cases (PDC) as confirmation with ELISA test was not possible.

Results:

Out of 100 Dengue suspected samples tested, 46 were reactive for either NS1 antigen or IgM antibody. Hence the prevalence rate of Dengue cases in our study was 46% (Table 1). Males seemed to be more commonly affected 76% as compared to the females 24% (Fig 1). Maximum reactive cases i.e 54% were seen to belong to age group of 21 years to 35 years. Most of the cases occurred in monsoon with maximum cases seen in the months of August and September. Abdominal pain, vomiting, myalgia, and hepatomegaly were commonest symptoms in probable Dengue cases(Table 2). Hypoalbuminemia was seen to be the commonest complication (Table 6) and the mortality rate was 6.5%(Table 2).

Table 1: Prevalence of Probable Dengue cases (n=100)

Total samples	Probable Dengue cases (Reactive for NS1/IgM)	Non Reactive cases
100	46 (46%)	64 (64%)

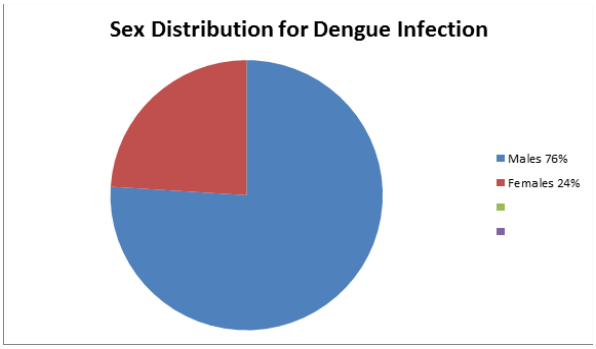

Fig 1: Sex Distribution for Dengue infected cases.

Table 2: (n=46) Comparison of Clinical features and Complications at Initial presentation of probable Dengue cases

Presenting Complaints	Dengue cases n=46 (%)
Pattern of Fever	
Intermittent	02 (4%)
Remittent	01 (2%)
Continuous	15 (33%)
Fever grade	
Mild	05 (11%)
Moderate	07 (15%)
High	15 (32%)
Rash	02 (4%)
Bleeding	04 (9%)
Abdominal pain	05 (11%)
Resp. symptom	03 (6%)
Vomiting	13 (28%)
Diarrhoea	03(6%)
Arthralgia	05(11%)
Myalgia	07(15%)
Retro-orbital pain	02 (4%)
Hepatomegaly	07 (15)%
Hypotension	05 (11%)
Hypoalbuminemia	07 (15%)
Rising hematocrit	05 (11%)
Haemorrhagic manifestation	04 (9%)

Discussion and Conclusion:

This prospective study was conducted in the Department of Microbiology of MGM Medical College and Hospital Kamothe, Navi Mumbai over a period of one year from December 2014- December 2015.

Clinically suspected cases attending the tertiary care hospital were screened for Dengue NS1Ag and differential detection of IgM and IgG antibodies by rapid immuno-chromatographic Dengue Day 1 test kit.

Total of 100 Dengue suspected sample were screened in which 46 were reactive and 54 were non-reactive Dengue samples .So, in our study, the prevalence of probable Dengue fever was 46 (46%) only, (Table1) this is quite comparable with the study carried out by Saini. S et al (2013) in Maharashtra India, in which the prevalence of Dengue fever was 30.6% (281/917). [8]

Whereas in a study carried out by Rao Srinivaset al (2013) in South India, the prevalence of probable Dengue fever was 53.2% (706/1327).[6]

In our study, out of 46 probable Dengue positive patients 76% (35/46) patients were males and the rest 24% (11/46) were females. Our study shows, that the infection was two folds more in males patients as compared to the females. (Fig 1) .Also, according to the study carried out by Neeraja M et al (2006) in Andhra Pradesh, India within the Dengue infected patients, infection was two folds more in male patients as compared to females .[9]

In another study carried out by Kartik et al (2014) in Banglore, India within the both Dengue and Chikungunya Co-infected patients 56.58% (116/205) were male and 43.41% (89/205) were females10 which is similar to our findings.

In our study, maximum of Dengue positive patients were of age group 21 to 35 years. Similarly, in a study carried out by Taraphdar D et al (2012) in Kolkata, India highest number of Dengue positive patients as well as Chikungunya positive patients was found in the age group of 31-40 years (27.9%).[11]

Our study done over a period of one year from December 2014 - December 2015, has shown that Dengue primarily occurs during the monsoon and the post monsoon months showing a major decline in other seasonal months i.e. from November to February and from March to June months.. This type of seasonal variation was seen in most of the studies, because transmission intensifies at the start of the rainy season when infected vector mosquitoes are more abundant. This finding correlated with similar findings of other authors Kalawat U et al (2011) who reported that a seasonal peak of Dengue was seen in months of June to Sept. 12 Similarly, Kartik et al (2014) reported that a seasonal peak of Dengue and Chikungunya was seen in the months of June to August.10 Bharathi N et al (2015) in Tamilnadu, India reported that maximum cases of Dengue and Chikungunya were reported during the monsoon season and post- monsoon season while a seasonal peak seen from July to October. [13]

In our study Fever was the most common presenting complaint amongst the serologically positive cases and tested cases. Out of 46 probable Dengue positive patients continuous high grade fever was seen in 33% patients .Abdominal pain, vomiting, myalgia, and hepatomegaly were commonest symptoms in probable Dengue cases (Table 2)

This is quite comparable with the study, carried out by Taraphdar D et al (2012) reported that fever is the most common features in both Dengue and Chikungunya infection. Abdominal pain, vomiting are the most common symptoms in case of Dengue infection11. In our study hypoalbuminemia was the commonest complications in probable Dengue cases (Table 2) This is quite comparable with a study carried out by Kartik et al (2014) [10.]

Mortality rate was 6.5% in probable Dengue cases. (Table7) Gandhi S Bhooshan et al (2012) stated that individuals with Co- infection of Dengue and Chikungunya appear to be more likely to suffer from complications and to have a high risk of Death. [14]

This data is significant since there is no treatment for these infections but early detection and access to proper medical care will cause lower fatality rate.

References:

1. Gupta N, Srivastva S, Jain A, et al. Dengue in India. Indian J Med Res 136, September 2012; pp 373-390.
2. Parida M, Horioke K, Ishida H, et al. Rapid detection and differentiation of Dengue virus Serotypes by a Real-Time Reverse Transcription–Loop-Mediated Isothermal Amplification Assay. Journal of Clinical Microbiology, June 2005; 43(6): pp 2895-2903
3. Ananthnarayan R, Paniker CKJ, et al. Arboviruses. Textbook of Microbiology, 9TH Edition 2013; pp 516-527.
4. Kumar R, Tripathi P, Tripathi S, et al. Prevalence and clinical differentiation of

VOLUME-6 | ISSUE-4 | APRIL - 2017 • ISSN No 2277 - 8179 | IF : 4.176 | IC Value : 78.46

Dengue fever in Children in Northern India. Journal of Infection 2008; Volume 5: pp 444-449.
5. Murugananthi C, Ramyachitra D, et al. Dengue fever: An Analysis. Indian Journal of Applied Research. Jan 2014; volume 4: issue: 1: pp 155-157.
6. Rao S, Kumar P, Dass M, et al. Seroprevalance of Dengue virus in a tertiary care hospital, Andhra Pradesh. International Journal of Research in Medical Sciences. Oct-Dec. 2013; Volume 1: issue 4: pp 48-450.
7. Duane J. Gubler et al. Dengue and Dengue Hemorrhagic fever. Center for Disease Control and prevention. 1993; pp 1-22.
8. Saini S, Kinikar A, Deorukhar S et al. Epidemiology and seropositivity of Dengue fever cases in a rural tertiary care hospital of western Maharashtra, India. International Journal of Biomedical and Research 2013; 04 (07), pp 473-477.
9. Neeraja M, Lakshmi V, Teja VD et al. Serodiagnosis of Dengue virus infection in patients presenting to a tertiary care hospital. Indian Journal of Medical Microbiology. 2006; 24 (4), pp 280-282.
10. Kartik, Vineetha, K. R, et al. Seroprevalance of Dengue and Chikungunya co-infection and its clinical correlation in Banglore city Hospitals. International Journal of Current Research. December 2014; Vol. 6: Issue: 12, pp 11040-11044.
11. Taraphdar D, Sarkar A, Mukhopadhyay B, et al. A comparative study of clinical features between Monotypic and Dual infection case with Chikungunya virus and Dengue virus in West Bengal in India. Am. J Trop. Med. 2012; 86 (4): pp-720-723.
12. Kalawat U, Sharma K, Reddy G S, et al. Prevalence of Dengue and Chikungunya fever and their Co- infection. Indian Journal of Pathology and Microbiology, Oct-Dec 2011; 54 (4): pp 844-846.
13. Bharti N, Ramakritinan C. M, Kolandaswamy K et al. Geographical information system based study on Dengue and Chikungunya at Western Ghats districts, Tamil Nadu, India. International Journal of Mosquito Research 2015; 2 (3), pp 30-38
14. Gandhi S Bhooshan, Kulkarni K, Godbole M, et al. Dengue and Chikungunya Co-infection associated with more severe clinical disease than mono-infection. International Journal of Healthcare and Biomedical Research. Aprail 2015; Vol. 03: Issue: 03, pp-117-123.