ORIGINAL RESEARCH PAPER

Volume-7 | Issue-4 | April-2018 | PRINT ISSN No 2277 - 8179

INTERNATIONAL JOURNAL OF SCIENTIFIC RESEARCH

ASSOCIATION OF DENGUE FEVER AND BRADYCARDIA-THE ESTABLISHED FACT, AN EVALUATION.

Microbiology

Dr.MN Sumana Dept. of Microbiology, JSS Medical College, Mysore, Karnataka, India

Tabasum Begum M * Dept. of Microbiology, JSS Medical College, Mysore, Karnataka, India *Corresponding Author

Dr. Basavana Gowdappa H Dept. of Medicine, JSS Medical College, Mysore, Karnataka, India

ABSTRACT

Dengue is an acute febrile viral disease and is one of the most common arboviral mediated outbreaks reported with increased prevalence and with considerable morbidity and mortality. The present study aimed to define relative Bradycardia as a clinical sign and characteristic feature of Dengue fever. A total of 106 cases suspected of dengue were reported from July 2016 to September 2016. Out of which 60 cases were serologically positive for dengue infection. Demographic profile, clinical manifestation and laboratory parameters were noted. Of 60 serologically positive cases, majority were males (56.6%). Fever was the major symptom (100%) followed by headache (96.6%), myalgia (91.6%), retroorbital pain (78.3%), rash (48.3 %), abdominal pain (65%), Nausea-vomiting (88.3%), pleural effusion (28.3%) and petechiae (35%). Clinical Spectrum of cases includes 36.6 % cases of Dengue Fever, 56.6 % cases of DHF and 6.66% cases of DSS. In our study 80 % cases had thrombocytopenia and 20% cases had normal platelet counts. Pulse rate distribution showed 26.6% with bradycardia, 55 % with relative bradycardia, and 13.3 % with tachycardia and ECG changes showed 38.3 % with sinus bradycardia, 48.3 % with normal sinus rhythm, and 13.3 % with sinus tachycardia. Hence, awareness of bradycardia as a clinical finding, can help in the early recognition of dengue complications and reduction of death associated with dengue virus infection.

KEYWORDS

Dengue, Relative bradycardia, clinical manifestation, laboratory parameters, Thrombocytopenia

I. INTRODUCTION

Dengue is currently the most important vector borne viral disease afflicting humanity in terms of both morbidity and mortality. It is considered reappearing and is distributed on continental proportions. This viral infection is transmitted mainly by Aedes aegypti. There is a huge burden on populations in most tropical countries of the world due to outbreaks[1]. It is estimated that there are approximately 20 million cases of dengue infection in the world resulting in around 24000 deaths annually.

India is one of the seven identified countries in south-east asia region regurlarly reporting incidence of DF/DHF outbreaks and may soon transform into major condition for dengue infection in the near future[2]. Dengue virus can cause a wide variety of clinical illnesses ranging from mildly symptomatic dengue fever (DF) to more dangerous clinical conditions with capillary leakage syndrome such as dengue hemorrhagic fever (DHF) and dengue shock syndrome (DSS).These fatal forms of the disease have been reported in India from time to time in Kolkata, Delhi and Chennai[3]. It took almost 30 years for dengue to eventually spread throughout the entire country, resulting in the first major nationwide outbreak of DHF in the year 1996. No specific clinical features distinguish dengue from other febrile illnesses, thus diagnosis mainly relies on results of laboratory investigations[4,5,6,7].

Relative bradycardia has been reported in many infectious diseases, including typhoid fever, Legionnaires' disease, psittacosis, typhus, leptospirosis, malaria etc[8].

Relative bradycardia is a notable clinical feature of Dengue fever and it was first reported from Singapore in 2005[9]. To-date very few studies have addressed the issues of cardiac manifestations of dengue fever. During, the dengue outbreak in Mysore in 2016, we observed relative bradycardia in several patients with dengue fever. Hence, this study was taken up to observe the pattern of heart rate and electrocardi ographic changes associated with Dengue fever.

II. MATERIALS AND METHODS

This study was performed at a tertiary care hospital, Mysore from July 2016 to September 2016. The study design was hospital based descriptive study. A total of 106 serum samples obtained from clinically suspected cases of dengue infection were tested. The study group included individuals from age group of more than 3 years to 65 years. The samples were tested immediately for NS1 and IgM. Out of 106 samples, 60 were positives. Out of 106 suspected samples 38 were found to have lgM antibodies against Dengue virus and remaining 22 were NS1 positive Dengue specific lgM antibody and NS1 antigen was detected by Inbios Dengue Capture ELISA KIT. Demographic data, clinical manifestation and laboratory data of seropositive cases were analysed. All the seropositive cases included the study were examined for vital signs (pulse/heart rate, blood pressure, respiratory rate, temperature). Critically ill patients were excluded from the study.

III.RESULTS

Table 1 : Age and sex wise distribution of dengue positive cases.

Age group (yrs)	No. of cases (60)	Percentage
0-15 (>3 yrs)	4	6.66%
15-30	19	31.6%
30-45	24	40%
45-60	11	18.2%
60-75 (<65 yrs)	2	3.33%
Gender		
Male	34	56.6%
Female	26	43.3%

Figure 1:

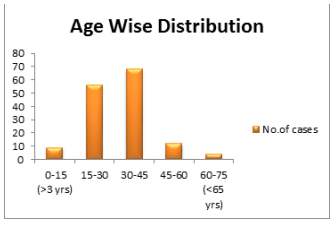


Figure 2:

Table 2 : Geographical Distribution

Locality	No. of Cases	Percentage
Mysore	17	28.3%
Mandya	14	23.3%
Chamrajanagara	04	6.66%
Nanjangudu	16	26.66%
T.Narasipura	07	11.66%
Hassan	02	3.33%

Figure 3:

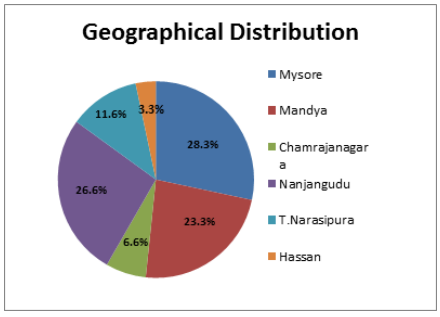


Table 3: Clinical Manifestations

Clinical symptoms	No of positive cases	Percentage
Fever	60	100%
Headache	58	96.6%
Chills	47	78.3%
Rash	29	48.3%
Myalgia	55	91.6%
Retro-orbital pain	47	78.3%
Nausea-vomiting	53	88.3%
Arthalgia	49	81.6%
Abdominal pain	39	65%
Anoroxia	26	43.3%
Pleural effusion	17	28.3%
Petechiae	21	35%

Figure 4:

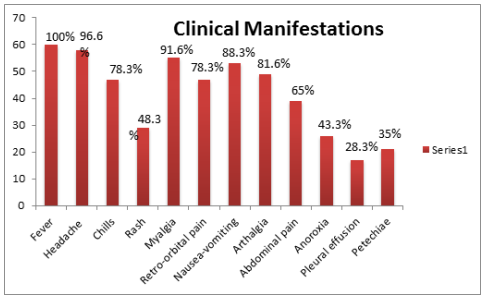


Table 4: Distribution of platelet counts in positive cases

Platelet count/µL	No of cases	Percentage %
0-30000	07	11.6%
30000-60000	32	53.3%
60000-90000	09	15%
90000-120,000	06	10%
120,000-150,000	02	3.33%
>150,000	04	6.66%

Figure 5:

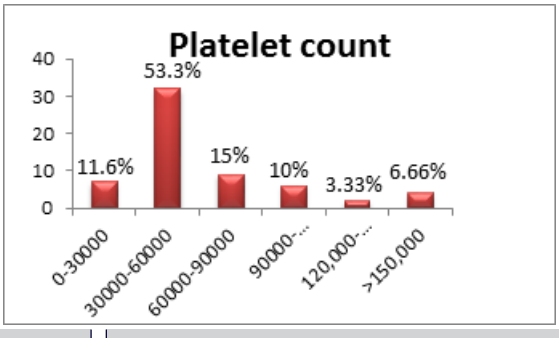


Table 5: Clinical Spectrum of cases

Clinical Spectrum	No of cases	Percentage
Dengue fever	22	36.6%
DHF	34	56.6%
DSS	04	6.66%

Figure 6: Clinical Spectrum

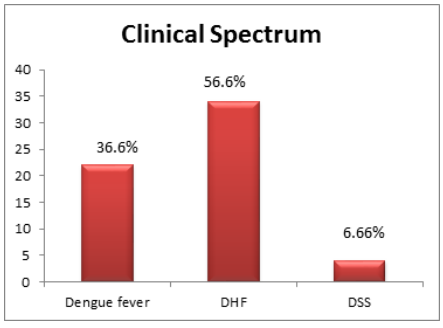


Table 6: Distribution of pulse rate

Pulse rate	No of cases	Percentage
<40	4	6.6%
40-60	19	31.6%
60-100	29	48.3%
>100	08	13.3%

Figure 7: Distribution of pulse rate

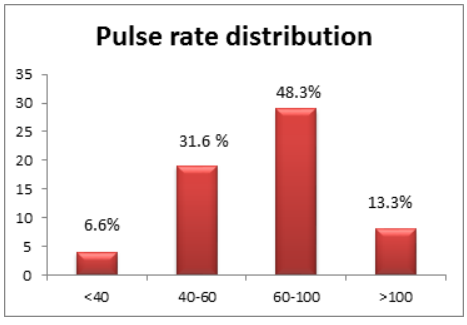
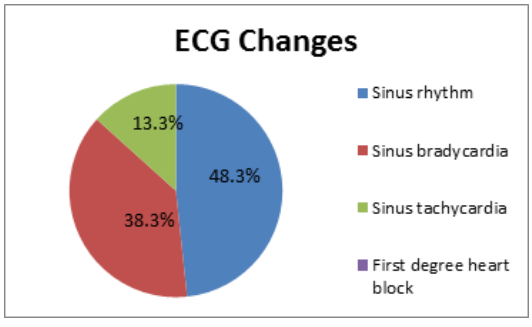


Table 7: Changes in ECG among cases

ECG	No of cases	Percentage
Sinus rhythm	29	48.3%
Sinus bradycardia	23	38.3%
Sinus tachycardia	08	13.3%
First degree heart block	0	0

Figure 8: ECG Changes



I. DISCUSSION

Dengue is one of the most important emerging diseases globally. Majority of symptomatic infections result in a relatively benign disease course[10]. Dengue is characterized by increased vascular permeability causing hypovolemic shock that can lead to cardiovascular collapse. Viral myocarditis is a well recognized complication of many viruses leading to subsequent cardiomyopathis. Various arboviral infections can cause myocardial damage, either by direct invasion or an autoimmune reaction, resulting in myocarditis[11].

Cardiac dysfunction associated with acute phase of dengue fever is

often under diagnosed due to low index of clinical suspicion and its overlapping clinical manifestation such as hypotension, tachycardia, pulmonary edema and capillary leak associated with dengue virus infection. Although cardiac manifestation specific to dengue is rare, depression of myocardial function is frequent in DHF and DSS[12]. During the monsoon period, the occurrence of Dengue virus infection was seen not only in Mysore District, but also to the neighboring districts of Mandya, Nanjungudu, Chamarajnagar and Hassan. Bradycardia was a notable feature among initially reported cases of Dengue fever and this made us to undertake the present study.

During the study period, a total of 106 serum samples were tested for dengue. Of the total samples tested, 60 (56.6%) were found to be positives. Among these, 38 (63.3%) patients were diagnosed with IgM and 22 (36.6%) were NS1 antigen cases. Out of 60 seropositive cases, 34 were males and 26 were females . 19 (31.6%) cases were observed in 15-30 years age group and 24 (40 %) of cases were observed in 30-45 years age group.

In a study by Gore MM et al., in 1996 and Baruah J et al., in 2002, the most common age group affected was 5-20 years. In a study by Ramesh SS et al., in 2010, the most common age group was 20-39 years. The mean age in present study is 30.21 years. This is comparable to the study done by Gupta et al in 2008[13,14].

Amongst the cases in our study, 28.3% cases were from Mysore, 23.3% cases were from Mandya, 26.6% cases were from Nanjungudu, 11.66% cases were from T.Narasipura, 6.66% cases were from Chamarajanagara and 3.33% cases were from Hassan. As the tertiary care hospital not only caters Mysore district, but also its nieghbouring districts.

Fever was the commonest presenting symptom 60 (100%), followed by severe headache 58 (96.6%), chills 47 (78.3%), retro-orbital pain 47 (78.3%), myalgia 55 (91.6%), rad 29 (48.3%), nausea-vomiting 53 (88.3%), anorexia 26 (43.3%) and abdominal pain 39 (65%). Pleural effusion was seen in 17 (28.3 %) of cases and petechiae was seen in 21 (35%) of cases.

The clinical spectrum of cases in our study included 36.6 % cases of Dengue Fever, 56.6 % cases of DHF and 6.66% cases of DSS.

A study by Neerja M et al., showed that DF 85%, DHF 5% and DSS 10% of cases[13]. In a study by Gupta et al., 2008, showed DHF 72%, DSS 28% and in a study by Ramesh SS etal 2010, showed DF 22%, DHF 72% and DSS 6% which is comparable to our study[14,15].

In our study 80% cases had thrombocytopenia and 20% cases had normal platelet counts.

In our study clinical pulse rate distribution amongst cases showed 26.6% with bradycardia, 55 % with relative bradycardia, and 13.3 % with tachycardia. This is comparable to study done by Gupta et al in 2008 9; 18% with bradycardia, 64% with relative bradycardia, 18% with tachycardia[14].

Electrocardiographic changes in our study showed 38.3 % with sinus bradycardia, 48.3 % with normal sinus rhythm, and 13.3 % with sinus tachycardia.

In the study done by Gupta et al in 2008, 11% had sinus tachycardia, 77% had normal sinus rhythm, and 12% had sinus tachycardia[14].

Various infection cause relative bradycardia and in the differential diagnosis one should always keep in mind the important causes for the same. The exact pathophysiology of bradycardia in dengue fever is uncertain, relative importance of immune, neural mechanism or any direct cardiac pathology has been postulated in previous studies, which requires further confirmation.

II. CONCLUSION

We have found that relative bradycardia is a notable clinical feature of Dengue fever. It is not just Thrombocytopenia- a feature of Dengue. The heart rate of patients with dengue is also a major concern. Hence, awareness of bradycardia as a clinical finding, can help in the early recognition of dengue complications and reduce death associated with dengue virus infection.

REFERENCES

1. Guzman MG, Kouri G. Dengue: an update. Lancet Infect Dis. 2002; 2(1): 33–42.
2. Ashwini Kumar, Chythra R Rao, Vinay Pandit, Seema Shetty, Chanaveerappa Bammigatti and Charmaine Minoli Samarasinghe. Clinical Manifestations and trend of Dengue cases admitted in a tertiary care hospital, Udupi Distyrict, Karnataka. Indian J Community Med, 2010; 35(3): 386-390.
3. Tabasum Begum M, Dr.MN Sumana and Dr.Basavanagowdappa. Clinical and laboratory profile in seropositive dengue cases at a tertiary care hospital, South India. World J of Pharmacy and Pharmaceutical Sciences, 2017; 6(7) : 1571-1581.
4. Victor TJ, Malathi M, Gurusamy D, Desai A, Ravi V, Narayanasamy G, et al. Dengue fever outbreaks in two villages of Dharmapuri district in Tamil Nadu. Indian J Med Res, 2002; 116: 133-139.
5. 7. Arunachalam N, Murty US, Kabilan L, Bala-subramanian A, Thenmozhi V, Narahari D, et al. Studies on dengue in rural areas of Kurnool District, Andhra Pradesh, India. J Am Mosq Control Assoc, 2004; 20: 87-90.
6. 8. Tewari SC, Thenmozhi V, Katholi CR, Manavalan R, Munirathinam A, Gajanana A. Dengue vector prevalence and virus infection in a rural area in south India. Trop Med Int Health, 2004; 9: 499-507.
7. Paramasivan R, Thenmozhi V, Hiriyan J, Dhanan-jeyan KJ, Tyagi BK, Dash AP. Serological and entomological investigations of an outbreak of dengue fever in certain rural areas of Kanyakumari district, Tamil Nadu. Indian J Med Res, 2006; 123: 697-701.
8. Ostergarrd L, Huniche B, Andersen PL. Relative bradycardia in infectious diseases. The Journal of Infection, 1996; 33(3):185-91.
9. Aisha Lateef, Dale Andrew Fisher, and Paul Ananth Tambyah. Dengue and Relative Bradycardia. Emerging Infectious Diseases. 2007; 13(4): 650-651.
10. Yacoub S, Wertheim H, Simmons CP, Screaton G, Wills B. Cardiovascular manifestations of the emerging dengue pandemic. Natural Review Cardiology. 2014; 11(6): 335-45.
11. Senaka Rajapakse. Dengue Shock. Journal of Emergency Trauma Shock. 2011; 4(1): 120-127.
12. Abhinandya Mukhopadhyay , Rakesh Kumar , Dr B.K.Singh. A Study on Cardiac Manifestations of Dengue Fever. Journal of Medical Sciences and Clinical Research. 2017; 5(4): 201736-20745.
13. Neeraja M, Lakshmi V, Teja VD, Umabala P and Subbalakshmi MV. Serodiagnosis of dengue virus infection in patients presenting to a tertiary care hospital. Indian J Med Microbiol 2006; 24: 280-2.
14. Vishal Kumar Gupta, AK Gadpayle. Subclinical Cardiac Involvement in Dengue Hemorrhagic Fever. JIACM 2010; 11(2): 107-11.
15. Ramesh S , Basavaraju M, Sandeep R. Sharma, Shetty Shivakumar , Srinivasa M , Surakshith T. K, Ravichethan Kumar. Study of Bradycardia in Dengue fever. Journal of Evolution of Medical and Dental Sciences 2014; 3(9): 2378-2388.