



Relative Bradycardia in Dengue Fever

KEYWORDS

Dengue, Relative Bradycardia

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ABSTRACT *Aims and Objective:* To determine prevalence of Bradycardia in serologically confirmed cases of Dengue fever

Material and Methods: This is a single centre retrospective observational study at SKN Medical college and General Hospital, Pune. Case patients were selected considering inclusion & exclusion criteria from serologically confirmed Dengue cases. Age matched Control cases were selected from other patients with fever without Dengue infection. The parameters were recorded at the time of admission and were analysed with standard statistical tests.

Conclusion: Out of 31 patients selected, bradycardia was observed in 12 patients. The finding of relative bradycardia in presence of fever should prompt clinician to suspect Dengue infection.

INTRODUCTION

Dengue fever is a disease causing considerable morbidity and mortality. Worldwide >2.5 billion persons are at risk and it is endemic in more than 100 countries¹. In India, during monsoon there was a surge in Incidence of Dengue fever and its related complications. Although, the diagnosis by laboratory tests is easy, but in periphery and rural areas, where there is lack of diagnostic facilities, diagnosis of Dengue remains elusive and may be missed. Virus-specific immunoglobulin M (IgM) antibodies only become detectable after 5–7 days, and false-positive results can confound the diagnosis. PCR is a useful diagnostic tool; however, it is limited by the short duration of viremia and requirements for highly sophisticated laboratory support.² In the following case series, we describe heart rate findings in patients admitted at Hospital with proven diagnosis of Dengue by serological test.

MATERIAL & METHODS

Study Design

This was a single centre retrospective observational study. The records of all the patients admitted in SKN Hospital with a febrile illness to the hospital from August 1, 2014 to October 31, 2014 were reviewed. Patients with a clinical diagnosis of dengue fever and serologic confirmation (Dengue IgM positive) plus a temperature >38°C were included as case-patients. Age-matched controls were selected from the same hospital's patients, who were admitted during the same period. All such control patients, who had fever, but had a proven alternative diagnosis, such as upper respiratory tract infection (8 patients), pneumonia (1 patient), urinary tract infection (7 patients), tuberculosis (1 Patient), viral fever other than dengue (3 patients), cellulitis (2 patients), typhoid fever (4 patients), gastroenteritis (5 patient). The following were the exclusion criteria: no laboratory confirmation, age <18 years or >60 years, pre-existing substantial heart or lung disease or concurrent medication affecting heart rate, e.g., β -blockers, β -agonists, calcium channel blockers.

The pulse rate and temperature of all case-patients and

controls on admission were taken into consideration. Data from case-patients and controls were tabulated and analyzed with Microsoft Excel (Microsoft Corp., Redmond, WA, USA).

RESULTS

A total of 31 patients with proven serological diagnosis of Dengue (Case patients) and 31 patients having fever due to other causes (as mentioned above) were considered for the study. The mean age (\pm standard deviation) for dengue patients was 31.06 (\pm 9.40) years and for controls was 32.5 (\pm 8.2) years. Their mean peak temperatures were comparable: 39.1°C (\pm 0.50) (Dengue patients) and 38.7°C (\pm 0.62) (Controls).

Of the 31 Dengue patients, 12 patients (6 Male, 6 Female) had bradycardia. Wherein the control group had 3 patients (2 Male, 1 Female) with bradycardia.

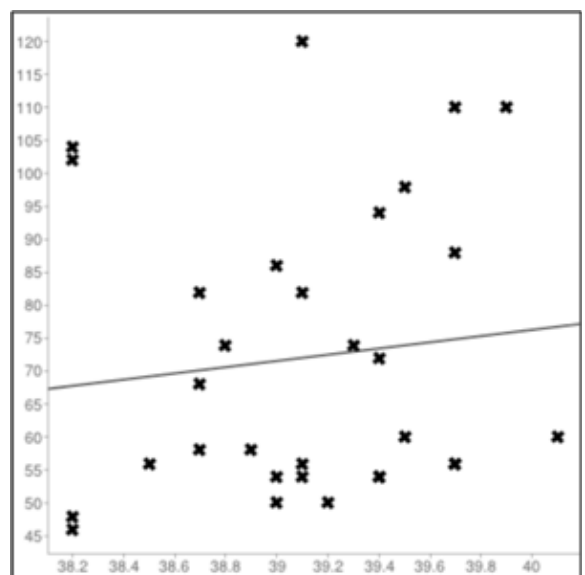


Figure 1 : Scatter Plot : Showing Temperature and Heart rate relationship for Dengue patients (X axis : Temperature in Degree Celsius; Y Axis : Heart rate/min)

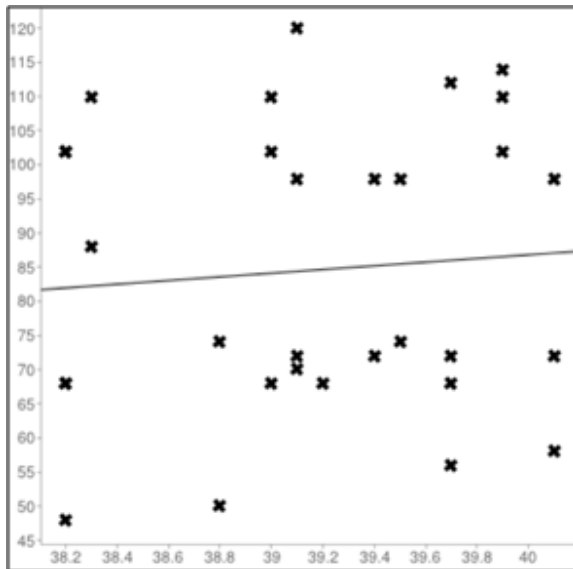


Figure 2 : Scatter Plot : Showing Temperature and Heart rate relationship for patients having fever due to causes other than Dengue (X axis : Temperature in Degree Celsius; Y Axis : Heart rate/min)

Whilst there is statistically no significant difference in occurrence of bradycardia amongst male or female; majority of bradycardia cases (8 out of 12 cases) are in patients with age less than 30yr. There were no other rhythm abnormalities noted in these patients.

DISCUSSION

Bradycardia in Dengue fever has received scarce attention in literature. Dengue fever can affect cardiac function in number of ways. Bradycardia in dengue fever may not be the only be a cardiac phenomenon and should be looked at carefully during both acute and convalescence period for other cardiac manifestations. Depressed myocardial contractility and suboptimal heart rate response , acute reversible hypokinesia and reduction in left ventricular ejection fraction are some of the examples of cardiac complications by Dengue fever.^{3,4}

The underlying mechanisms are thought to be of immunological origin. Fever production in response to exogenous pyrogens is believed to be mediated mostly by cytokine prostaglandin pathways, and neural input is important in the early phases of fever.⁵ Concentrations of cytokines, including tumor necrosis factor(TNF), interferon- γ , IL-8, IL-10, and IL-12 are substantially increased during dengue infection. Their levels likely correlate with specific clinical manifestations and illness severity.⁶The relationship of cytokines to relative bradycardia is unknown at present. Whether brisk immunological response induced in young patients is the cause of bradycardia, is unknown.

Further studies may consider to elucidate the contribution of immune and neural mechanisms towards the various cardiac manifestations observed in Dengue infection.

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