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Cardiac and Neurological Manifestations in Dengue Patients at Tertiary Care Hospital Bikaner, Rajasthan

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Abstract

Background: Dengue infection, an arthropod-borne viral hemorrhagic fever, continues to be a major challenge to public health, especially in Asia. It has a wide geographical distribution, and can present with a diverse clinical spectrum.

Methods: This prospective study was conducted in Department of Medicine, S.P. Medical College Bikaner from October 2017 to October 2019. Cases admitted with features of dengue illness along with positive dengue serology during October 2017 to October 2018 in Department of Medicine were included who fulfilling our inclusion and exclusion criteria.

Results: According to CNS involvement, encephalitis and GBS was present in 1(0.5%) case each while all other patients had no CNS involvement. Myocarditis was present in 2 patients and remaining 186 patients had no myocarditis.

Conclusion: Dengue is a challenging disease with some typical, atypical and sometime life threatening manifestations. Awareness of these manifestations goes a long way in early recognition, correct diagnosis, prompt investigations and appropriate treatment.

Keywords: Cardiac, Neurological, Dengue.

Introduction

Dengue fever was first reported in 1780, when Benjamin Rush described this condition as "Break bone fever" because it causes such severe aches in the joints. Dengue virus (DENV) is a mosquito-borne single-stranded RNA virus member of genus Flavivirus of the family Flaviviridae. It is mosquito borne viral infection with four serotypes, causing dengue fever (DF), dengue hemorrhagic fever (DHF), and dengue shock syndrome (DSS). It is estimated that worldwide more than 50 million infections occur each year including 500,000 hospitalizations for dengue hemorrhagic fever, mainly among children with the case fatality rate exceeding 5% in some areas[1]. Dengue has been identified as one of the neglected tropical diseases by WHO as mentioned in their report on neglected tropical diseases (2010)[2]. Approximately 1.8 billion (more than 70%) of the population at risk for dengue worldwide live in

Member States of the WHO South East Asia Region (SEAR) and Western Pacific Region, which bear nearly 75% of the global disease burden due to dengue[3].

Recent observations indicate that the clinical profile of dengue is changing, and that neurological manifestations are being reported more frequently. The exact incidence of various neurological complications is uncertain.[4] Pathogenesis of the neurological manifestations is multiple and include neurotrophic effect of the dengue virus related to the systemic effects of dengue infection and immune mediated. There are various neurological manifestations including seizure, encephalopathy, meningitis, myelitis, Guillain-Barré syndrome (GBS), and myoclonus that are commonly reported. In the last few years, numerous neurological complications related to dengue fever (DF) have been reported and these lead to significant morbidity and mortality. Neurological complications occur in 0.5-6% of cases with DF. [5]

It is postulated that, dengue rarely affects the heart. Medical literature has reports of isolated cases of atrioventricular conduction disorders (junctional rhythm and atrioventricular block), supraventricular arrhythmias, and myocarditis. On the other hand, the ventricular dysfunction associated with the acute phase of dengue hemorrhagic fever has been described by several authors and is probably under diagnosed in clinical practice.[6] Although cardiac manifestations specific t o dengue are rare, depression of myocardial function is frequent in the hemorrhagic form of the disease or in the associated shock.

Material and Methods

This prospective study was conducted in Department of Medicine, S.P. Medical College Bikaner from October 2017 to October 2019. Cases admitted with features of dengue illness along with positive dengue serology during October 2017 to October 2018 in Department of Medicine were included who fulfilling our inclusion and exclusion criteria.

Type of the Study: Prospective Study

Selection criteria for dengue illness

Sampling Method : Consecutively sampling method

Inclusion Criteria

- Patients who were serologically positive with dengue illness will be included.
- Age >14 Yrs.
- Those willing to provide written informed consent and comply with protocol requirement.

Exclusion Criteria

- Other concomitant illness like malaria, enteric fever, chikungunya etc.
- Subjects unwilling to consent for the study.

Diagnosis of dengue infection

- ELISA based NS1, IgM & IgG.

Detailed history was taken regarding duration and type of fever, abdominal pain, headache, vomiting, myalgia, urine output and bleeding tendencies since day first of admission. Thorough clinical examination was done. Temperature, pulse, respiratory rate, blood pressure, pallor, petechiae/ecchymosis, liver and spleen size and consistency were recorded. Other systemic examination will be done in case of relevant history. All the findings were recorded on predesigned proforma. Categorization of dengue illness was made according to WHO Guideline 2009.

Statistical Analysis

Appropriate statistical analysis was applied as and when required using SPSS software for statistical analysis. Considering the p value (0.05) as statistically significant.

Observations

Table 1: Socio-demographic profile

Mean age	31.22±11.52 Years
Male : Female	1:0.96
Rural : Urban	72 : 116

Mean age in study group was 31.22±11.52 years. According to gender, almost equal percentage of males and female was found. Male to female ratio was 1:0.96. According to residential area, majority of patients belonged to urban area (61.7%) while remaining 38.3% cases belonged to rural area.

Table 2: Distribution of cases according to myocarditis

Myocarditis	No. of Cases (n=188)	Percentage
Present	2	1.1
Absent	186	98.9
Total	188	100

Myocarditis was present in 2 patients and remaining 186 patients had no myocarditis.

Table 3: Distribution of cases according to CNS involvement

CNS Involvement	No. of Cases (n=188)	Percentage
Encephalitis	1	0.5
GBS	1	0.5
Normal	186	99.0
Total	188	100

According to CNS involvement, encephalitis and GBS was present in 1(0.5%) case each while all other patients had no CNS involvement.

Discussion

Two patients were diagnosed as myocarditis. These patients had benign though prolonged and self limiting course. Bhasin et al [7]also reported a case of DHF with myocarditis mimicking DSS with hypotension and pulmonary edema. But no case had SA node, AV node dysfunction, AF, cardiomyopathy and other cardiac abnormalities.

The neurological complication in dengue infection has been hypothesized through pathogenic mechanisms concerned with neurotropism, leading to encephalitis, meningitis and myelitis, and systemic complications, thereby resulting in encephalopathy, stroke, and hypokalemic paralysis, and postinfections like immune-mediated acute disseminated encephalomyelitis (ADEM), GBS, and optic neuritis. Encephalopathy may be due to hyponatremia, cerebral edema, and microvascular frank hemorrhage. The exact incidence and types of neurological manifestations in dengue have not been reported. Various discrete data are available regarding neurological illness in dengue. [8]

One case was found to have GBS (0.55%), one encephalitis (0.55%), (1.1% neurological findings) in our study while Karoli et al[9] described neurological involvement up to 14%. In the form of encephalopathy, hypokalemic, periodic paralysis, myositis and GBS. Another study by Nimmagadde et al[10] placed incidence of neurological manifestation at 2% encephalitis or meningitis. No case was found to have ICH in our study.

Conclusion

Dengue is a challenging disease with some typical, atypical and sometime life threatening manifestation. Awareness of these manifestations goes a long way in early recognition, correct diagnosis, prompt investigations and appropriate treatment. Every aspect of dengue viral infection remains a clinical challenge so recognition of infection is helpful in minimization of complications and mortality.

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