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Original Research Article

A study on clinical profile of patients with dengue fever at a tertiary care hospital

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Abstract

During the 19th century, dengue was considered a sporadic disease, causing epidemics. However, dramatic changes in this pattern have occurred and currently, dengue ranks as the most important mosquito-borne viral disease in the world. In the past 50 years, its incidence has increased 30-fold with significant outbreaks occurring in five of six World Health Organization (WHO) regions. The study was approved by the institutional ethical committee. Informed written consent was obtained from the parents of each patient before enrollment. History and examination findings were recorded in a pre-structured proforma. Children with clinically diagnosed dengue fever (WHO criteria) & serologically confirmed and admitted cases between the age group of 2months to 18years formed the study group. In my study population, all of them had a fever. The second most common presenting symptom was vomiting 112 (60.5%) cases, pain abdomen was next 73 cases(39.5%), 56 cases (30.3%) presented as a shock, 18 cases (9.7%) presented with bleeding manifestations and least being headache with 9cases (4.9).

Keywords: Dengue fever, pain abdomen, vomiting

Introduction

Dengue is one of the most important mosquito-borne illnesses worldwide [1]. It is caused by a flavivirus with four distinct serotypes (DENV1, DENV2, DENV3, and DENV4). Dengue infection is the most rapidly emerging vector-borne viral disease with a 30-fold increase in global incidence over the last five decades. It is a major public health concern throughout tropical and subtropical regions of the world [2]. During the 19th century, dengue was considered a sporadic disease, causing epidemics. However, dramatic changes in this pattern have occurred and currently, dengue ranks as the most important mosquito-borne viral disease in the world. In the past 50 years, its incidence has increased 30-fold with significant outbreaks occurring in five of six World Health Organization (WHO) regions. Dengue is endemic in 112 countries in the world at present [3]. DHF first emerged as a public health problem in 1954, when the first epidemic occurred in Manila. Major epidemics occurred in other regions of the world in the 1980s and 1990s and were caused by all four dengue viral serotypes [4]. Predominant serotype in the 1980s and the early 1990s was DEN-2, recently it has changed to the DEN-3 serotype. Dengue is a disease of children, it will affect any age group. Dengue infection is difficult to control, no specific treatment or vaccine is available [5]. Before 1970, only 9 countries had experienced severe dengue epidemics. The disease is now

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endemic in more than 100 countries. The America, South-East Asia and Western Pacific are the most seriously affected. Cases across the America, South –East Asia and Western Pacific exceeded 1.2 million in 2008 and over 3.34 million in 2016. Recently the number of reported cases has continued to increase. In 2015 2.35 million cases of dengue were reported in America, of which 10200 cases were diagnosed as severe dengue causing 1181 deaths. An estimated 50 million dengue infections occur annually (Figure 1) and approximately 2.5 billion people live in dengue-endemic countries [6]. The 2002 World Health Assembly resolution WHA55.17 urged greater commitment to dengue by WHO and its Member States. Of particular significance is the 2005 World Health Assembly resolution WHA58.3 on the revision of the International Health Regulations (IHR) [7], which includes dengue as an example of a disease that may constitute a public health emergency of international concern with implications for health security due to disruption and rapid epidemic spread beyond national borders. There occurs a 390million dengue infection annually in over 100 countries, of which 96million will have clinical features and 1% case fatality [8].

Methodology

The study was approved by the institutional ethical committee. Informed written consent was obtained from the parents of each patient before enrollment. History and examination findings were recorded in a pre-structured proforma. Children with clinically diagnosed dengue fever (WHO criteria) & serologically confirmed and admitted cases between the age group of 2months to 18years formed the study group. These children were subjected for following investigations. Complete blood count, C-reactive protein, serum aspartate aminotransferase (AST), alanine aminotransferase (ALT) levels. They are also investigated for myocarditis with following cardiac biomarkers. CPK, CPK-MB, LDH, Troponin T and N terminal fragment of B-type natriuretic peptide (NT-proBNP). CPK >195U/L, CPK-MB > 25U/L, LDH >450U/L level considered elevated. Troponin T levels >0.1 ng/mL were considered abnormal. NT-proBNP levels were used to identify patients with suspected left ventricular dysfunction. NT-proBNP levels were considered >450pg/ml considered elevated.

Inclusion criteria

- All clinically and serologically diagnosed dengue fever cases, fulfilling WHO criteria, between the age group of 2months to 18 years.

Exclusion criteria

1. Those who have not given consent.
2. Age less than 1month.
3. Those not confirmed dengue fever i.e NS1 / DengueIgM negative

Results

Table 1: Age distribution for the study population

Age group	Frequency	Percent
2m-1year	3	1.6
1-5year	83	44.9
5-10year	46	24.9
>10years	53	28.6
Total	185	100.0

In our study most common age was 1-5years, contributing to 83 (44.9%) cases.

Table 2: Gender distribution of the study population

Gender	Frequency	Percent
Male	107	57.8
Female	78	42.2
Total	185	100.0

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Males affected >females in the ratio of 1.3:1

Table 3: Symptoms distribution in the study population

Symptoms	Yes	
	Frequency	Percent
Fever	185	100.0
Rash	14	7.6
Headache	9	4.9
Vomiting	112	60.5
Pain abdomen	73	39.5
Loose stools	45	24.3
Shock	56	30.3
Bleeding	18	9.7

In my study population, all of them had a fever. The second most common presenting symptom was vomiting 112 (60.5%) cases, pain abdomen was next 73 cases(39.5%), 56 cases (30.3%) presented as a shock, 18 cases (9.7%) presented with bleeding manifestations and least being headache with 9cases (4.9).

Table 4: Hematocrit levels of the study population

PCV	Frequency	Percent
Elevated	152	82.2
Normal	33	17.8
Total	185	100.0

Out of 185 subjects, 152 cases (82.2%) had hematocrit elevation and 33 (17.8) cases had normal hematocrit levels.

Table 5: CPK levels in the study population

CPK	Frequency	Percent
Elevated	104	56.2
Normal	81	43.8
Total	185	100.0

In 185 subjects, 104 (56.2%) showed CPK elevation.

Discussion

During the feeding of mosquitoes on humans, DENV is injected into the bloodstream, with spillover into the epidermis and dermis of the skin, which results in infection of immature Langerhans cells (epidermal dendritic cells [DC]) and keratinocytes. Infected cells then migrate from the site of infection to lymph nodes, where monocytes and macrophages are recruited, which become targets of infection. Consequently, infection is amplified and the virus is disseminated through the lymphatic system. As a result of this primary Viremia, several cells of the mononuclear lineage, including blood-derived monocytes, myeloid DC and splenic and liver macrophages are infected [9].

Mononuclear cells predominantly die by apoptosis following infection. In response to infection, arbovirus affected cells in the host will produce inflammatory and hemostatic mediators. In this regard, factors that influence the number of target cells infected, and consequently the levels of viremia, may determine the ratio of different proinflammatory and anti-inflammatory cytokines, chemokines, and other mediators, as well as the way in which the inflammatory response affects the hemostatic system. Bone marrow stromal cells have also been shown to be susceptible to infection with DENV [10].

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In dengue, infection liver is commonly involved with some reports suggesting an association between elevated liver enzyme levels and spontaneous bleeding tendencies. Cases of dengue-associated hepatitis on microscopy shows midzonal hepatocyte necrosis, microvesicular steatosis, and councilman bodies. DENV is mainly found in human hepatocytes and kuppfer cells of the liver [11].

Certain viruses are responsible for more severe disease. On nucleotide variation, the dengue virus can be classified into various serotypes. Virulence of virus dependence on the genetics of the virus. Once mosquito bites then virus enters the body and replicates in macrophages, monocytes, and B cells. Infection of mast cells, dendritic cells, and endothelial cells are known to occur. 7-10 days is the incubation period of dengue fever. Initially, there will be a virameic phase in which the child will be febrile and infective and is followed recovery phase or leakage phase which may lead to DHF/DSS [12].

Conclusion

In my study population, all of them had a fever. The second most common presenting symptom was vomiting 112 (60.5%) cases, pain abdomen was next 73 cases(39.5%), 56 cases (30.3%) presented as a shock, 18 cases (9.7%) presented with bleeding manifestations and least being headache with 9cases (4.9).

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