Original Research Article

Clinico-Hematological Parameters in Dengue Fever: A Retrospective Study in a Tertiary Care Hospital

K. Vasundhara[1], A. Lavanya[2], B. Venkata Rajeswari[3]

[1,3]Assistant Professor, Department of Pathology, Viswabharathi Medical College & Hospital, Kurnool
[2]Associate Professor, Department of Pathology, Viswabharathi Medical College & Hospital, Kurnool

Abstract

Introduction: Dengue viral infections are among the most important mosquito-borne disease of the Indian subcontinent. Clinical manifestations of this illness range from a typical fever to dengue shock syndrome and death. The study was aimed to determine the clinical and haematological characteristics of patients with Dengue fever

Materials and Methods: This retrospective cross-sectional study was conducted at a tertiary teaching hospital, Kurnool over duration of one year. All the patients above the age of 14 years who were diagnosed with Dengue with a positive result for NS1Ag or IgM or IgG antibodies were included. All the necessary clinical and laboratory investigation parameters of the patients were obtained from the hospital's medical records. The data was analysed by frequency and percentage.

Result: During the study period, a total of 98 dengue cases were included in the study. Of these, there were 48 (49%) Males and 50 (51%) females between 15 and 76 year age. The most common clinical presentations were fever (100%), headache 87 (88.7%), myalgia 81 (82.6%), and nausea/vomiting 69 (70.4%). The common hematological findings were Thrombocytopenia 80 (59.8%), followed by Leucopenia 50 (26.5%), Anemia 39 (39.7%) and Hematocrit (10.2%)

Conclusion: Fever, Myalgia, and Headache are the most prevalent clinical manifestations of Dengue fever. Low total leucocyte count, low platelet count, and a rise in haematocrit are the most prevalent laboratory abnormalities. These clinical and laboratory profiles of typical dengue viral illnesses should alert physicians to the possibility of dengue virus infections in the study region.

Keywords: Dengue, Typical Fever, Tertiary Teaching Hospital, Thrombocytopenia, Aemia

Introduction

Dengue is a human arbovirus disease caused by a virus of the Flaviviridae family that is transmitted by the female Aedes aegypti mosquito [1]. The dengue virus has four serotypes: DEN-1, DEN-2, DEN-3, and DEN-4 [2]. Dengue infection is a systemic and dynamic disease that causes undifferentiated fever, dengue fever, dengue hemorrhagic fever, and dengue shock syndrome (DSS). It has a broad clinical spectrum, including both severe and mild clinical symptoms [3]. The sickness comes rapidly after the

incubation period and is followed by three phases: febrile, critical, and recovery [4].

Dengue fever is a self-limiting acute febrile disease that is followed by a critical defervescence period in which patients may improve or advance to a severe form. Hemodynamic abnormalities, increased vascular permeability, hypovolemia, hypotension, and shock are all symptoms of severe sickness. Both instances have thrombocytopenia and platelet dysfunction, which are linked to the clinical outcome [5]. Management of a disease with complicated presentations is relatively simple, affordable, and very effective in saving lives as long as precise and timely therapies are implemented [4].

The detection of NS1 antigen and dengue specific IgM/IgG has been the mainstay of Dengue Infection diagnosis [6]. Aside from dengue-specific indicators, platelet count and leukocytes are the only additional laboratory tests available in the peripheral areas to support the diagnosis of DHF or DSS. [7]

The present study aims to collect data from the medical records of all patients whose dengue infection was confirmed by a serological test and correlate it with clinical parameters & haematological parameters thereby increasing the screening sensitivity of healthcare professionals in the most severe cases of dengue infection.

Materials and Methods

This was a retrospective study conducted

in a tertiary care hospital in Kurnool on dengue fever patients from January 2021 to December 2021, with approval from the Institutional Ethics Committee. Before beginning the study, all subjects provided informed consent.

Inclusion criteria

Patients admitted with the clinical suspicion of dengue fever and with NS1 antigen and IgM antibody positive for DF

Exclusion Criteria

Patients with fever positive due to other infections. Patients under the age of 15 years.

Study tools: Data was collected in a structured perform, and all the relevant clinical and laboratory investigation details of the patients were collected from the medical records of the hospital.

Thrombocytopenia was defined as platelet count less than 150000/mm3 of blood. Leukopenia was defined as leukocyte count less than 4000/mm3 of blood. Cases of dengue were classified as per WHO classification of dengue[8].

After entering data in Microsoft Excel and importing it into Statistical Package for the Social Sciences (SPSS) 20, analysis was performed. Frequency and percentage were used in descriptive analysis. Data were represented by using Tables.

Result

The total number of males in our study were 50 (51%) while 48 (49%) were females and maximum number of patients were seen in the 21-40 year age group as shown in the Table 1.

Table 1: Gender and age of the study participants (n=98)

Variables		Number of participants (n)	Percentage (%)
Gender	Male	50	51%
	Female	48	49%
Age (in years)	<20	9	9.2 %
	21-40	57	58.1 %
	41-60	14	14.3%
	>60	18	18.4 %

The commonest clinical feature was Fever in 98 (100%) patients, followed by Headache in 87(88.7%) patients and Myalgia in 81 (82.6%) as shown in Table 2.

Table 2: Clinical characteristics of admitted cases (n=98)

Clinical Feature	Number of participants (n)	Percentage (%)
Fever	98	100
Headache	87	88.7
Myalgia	81	82.6
Nausea and vomiting	69	70.4
Abdominal pain	59	60.2
Eye pain	35	35.7
Mucosal bleeding	34	34.6
Abdominal distension	12	12.2
Rash	12	12.2
Conjunctival hemorrhage	18	18.3
Tourniquet test	7	7.1
Hepatomegaly	21	21.4

Thrombocytopenia was observed in 80 (81.6%) patients, Leucopenia was observed in 50 (51%) patients, Anaemia was observed in 39(39.7%) patients and Hematocrit was observed 10 (10.2%) patients as shown in Table 3

Table 3: Hematological parameters of Dengue cases (n=98)

Hematological test		Number of participants (n)	Percentage (%)
Platelet count (cells/cumm)	<140.000	80	81.6
(Normal value=1,40000-4,15,000/cumm)	>140000	18	18.4
WBC count (cells/cumm)	>4000	48	49
(Normal Value=4000-10,500/cumm)	<4000	50	51
Hemoglobin (gm/dl)	Males ≤ 13	20	20.4
(Normal value= M: 13-16 F:12-15)	Females ≤ 12	19	19.3
Hematocrit (%)	Males>46	7	7.1
(Normal values=M:38-46 F:35-44)	Females>44	3	3.06

Discussion

Dengue fever is a serious public health issue that causes significant morbidity and mortality in the general population, particularly in tropical and subtropical nations [9].

The clinical picture of Dengue Fever patients ranges from mild fever to severe organ dysfunction and blood loss. We evaluated the clinical profile of patients with dengue fever admitted to a tertiary hospital in Kurnool, India

Gender and age wise distribution

Males were slightly more affected than females in our study. This outcome was consistent with earlier research [10-13]. In the current study, 57 (58%) of the 98 patients were between the ages of 21 and 40. Deshwal *et al.* [14] investigated 515 Dengue cases. In their study, the majority of patients (62.91%) were between the ages of 21 and 40.Clinical presentation:

Fever was the most common manifestation in the current study, seen in 98 cases (100%), followed by headache and myalgia in 87 (88.7%) and 81 (82.6%) cases, respectively. In the study by Deshwal *et al*. [14], fever (100%) was followed by headache (94.75%), myalgia (90.67%), and in the study by Vibha *et al*.

[15], 95 (95%) of the patients had fever as a presenting symptom.

Hematological parameters

In the present study, A total leukocyte count of less than 4,000 cell/mm3 was present in 50 (51 %) cases. In Meena, *et al*. [16] study, A total leukocyte count of less than 4,000 cell/cumm was present in 51 (51%) patients.In the present study out of 98 cases of dengue fever, 80 (81.6 %) cases had thrombocytopenia, Deshwal, *et al*. [14] observed thrombocytopenia in 69.5% of cases. In Meena, *et al*. [16] study, (n=100), 90 (90%) cases had thrombocytopenia.

39 (39.7%) of the cases had haemoglobin levels below the cutoff values. This result is in line with that of another study [17]. At presentation, elevated hematocrit (>47%) was found in 10 (10.2%) of the patients. Deshwal, *et al*. [14] found that 20.7% of patients had elevated hematocrit of >47% at presentation. In 28 (28%) cases, > 40% hematocrit was noted by Vibha, *et al*. [15].

Conclusion

In this study, the most frequent clinical symptoms of dengue patients were fever, headache, and myalgia, and the most frequent laboratory findings were thrombocytopenia and leucopenia.

These frequent clinical and laboratory characteristics of dengue viral infections should alert doctors about the possibility of dengue virus infections in the study area.

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