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Original Research Article

Study of variations in clinical and hematological profile of dengue patients over time

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Abstract

Introduction: Dengue fever is an infectious mosquito-borne disease caused by dengue virus. Its symptoms include fever, headache, muscle and joint pains and rash. Dengue is endemic in more than 100 countries and causes an estimated 50 million infections annually. Nearly 3.97 billion people from 128 countries are at risk of infection. Individuals infected with dengue exhibit a wide spectrum of clinical symptoms ranging from asymptomatic to severe clinical manifestations, such as dengue shock syndrome. The WHO regions of Southeast Asia (SEA) and the western Pacific represent ~75% of the current global burden of dengue.
In the recent years there is a change in clinical and haematological features of dengue fever. This study is conducted to objectively identify and quantify the same.
Materials and Methods: Prospective observational study conducted in KIMS, Hubli from 2017 to 2019.
Results: Out of 101 cases, 60 male and 41 female studied in 2017 and 74 cases 50 male and 24 female in 2018, the average platelet counts were 58861±48917 and 75837±49734 respectively. The difference was statistically significant. Out of 101 cases, 26 (25.74%) had rashes, 5(4.95%) had bleeding manifestations and 2(1.98%) had joint pain. Out of 74 cases in 2019, 1(1.35%) had rashes, 3(4.05%) had bleeding manifestations and 4(5.40%) presented with joint pain. 22(21.78%) out of 101 cases in 2017 required platelet transfusion as compared to 5(6.75%) out of 74 cases in 2019.
Limitations: Serotyping for dengue virus was not done so the variations in clinical and platelet profile could not be attributed to specific serotype of dengue virus.
Conclusion: There is an overall decrease in severity of manifestations of dengue fever overtime with significant reduction in the patients suffering from dengue fever requiring platelet transfusions. Serotyping can be included as a routine workup for patients with dengue fever so as to improve prognostication.
Keywords: Clinical, hematological, dengue.

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1. Introduction

Dengue is an arthropod-borne viral disease caused by the four dengue virus serotypes (DENV 1–4), which are transmitted by Aedes mosquitoes. Dengue has evolved from a sporadic disease to a major public health problem with substantial social and economic effect because of increased geographical extension, number of cases, and disease severity. [1]

One modelling estimate indicates 390 million dengue virus infections per year (95% credible interval 284–528 million), of which 96 million (67–136 million) manifest clinically (with any severity of disease) [1].

Another study on the prevalence of dengue estimates that 3.9 billion people are at risk of infection with dengue viruses. Despite a risk of infection existing in 128 countries [2], 70% of the actual burden is shouldered by Asia [1].

Non-severe dengue illness often presents as flu-like illness, with symptoms included high fever, severe headache, pain behind the eyes, muscle and joint pains, nausea, vomiting, swollen glands, or rash. Severe dengue, including dengue hemorrhagic fever or dengue shock syndrome, is characterized by severe abdominal pain, persistent vomiting, rapid breathing, bleeding gums,

fatigue, restlessness, and blood in vomit, and may be fatal due to plasma leakage, fluid accumulation, respiratory distress, severe bleeding, or organ impairment. Although there is no specific treatment for dengue, case fatality rates can be below 1% with proper case management. In its absence, the case fatality rate can be as high at 20% in patients with severe dengue. [3]

In the recent years there is a change in clinical and haematological features of dengue fever. This study is conducted to objectively identify and quantify the same.

1.1 Aims and objectives of the study

1) To detect and compare the changing trends in clinical manifestations of dengue fever over time, between 2017 and 2019.
2) 2. To study the variations in hematologic profile including platelet count and the need for platelet transfusions overtime.

2. Materials and Methods

This prospective observational study was conducted among 101 patients suffering from NS1/IgM positive dengue cases in 2016 and again among 74 cases in 2019. Data was collected and the patients with concomitant malaria, typhoid and leptospirosis etc were excluded from the study. Detailed history and careful clinical examination was performed on each patient. Laboratory investigations included haemoglobin, total and differential leucocyte count, platelet count, haematocrit. Liver and renal functions with chest radiograph and ultrasound abdomen were also done. Blood counts were monitored periodically as and when required until resolution. Other illnesses were excluded with relevant investigations. The study was approved by Institutional Ethics committee and written informed consent was taken from each patient.

3. Results

Out of 101 cases in 2017, 60(59.40%) were males and 41(40.59%) were females. In 2019, 74 cases included 50(67.56%) were male and 24(32.44%) were females. Majority of cases reported during the rainy season showing the increased breeding of mosquitos during that period. Majority of cases in both time frames were males and belonging to 21-40 year age group. Table 1 and Table 2.

Table 1: Baseline characteristics of study subjects. N=101 (2017)

Age (Yrs)	Male	Female
12-20	14	14
21-40	34	19
>41	12	8
Total	60	41

Table 2: Baseline characteristics of study subjects. N=74 (2019)

Age (Yrs)	Male	Female
12-20	18	12
21-40	30	10
>41	2	2
Total	50	24

Fever was universal feature followed by headache and myalgia in both the groups. Out of 101 cases, 26 (25.74%) had rashes, 5(4.95%) had bleeding manifestations and 2(1.98%) had joint pain. Out of 74 cases in 2019, 1(1.35%) had rashes, 3(4.05%) had bleeding manifestations and 4(5.40%) presented with joint pain. Table 3

Table 3: Clinical features in 2017 and 2019

Clinical feature	No of patients in 2017(N=101)	No of patients in 2019(N=74)
Fever	100(100%)	100(100%)
Headache	94(93.06%)	43(58.10%)
Myalgia	90(89.10%)	38(51.34%)
Joint pain	2(1.98%)	4(5.4%)
Rashes	26(25.7%)	1(1.34%)
Bleeding manifestations	5(4.95%)	3(4.05%)

The average platelet counts among 101 cases in 2017 and 74 cases in 2019 were 58861±48917 and 75837±49734 respectively. The difference was statistically significant. 22(21.78%) out of 101 cases in 2017 required platelet transfusion as compared to 5(6.75%) out of 74 cases in 2019.

4. Discussion

With advancing knowledge regarding the disease process and with improvements in diagnosis and management. It has been observed that there is a decrease in the number of cases from 101 in 2017 to 74 in 2019.

The majorities of study subjects were males and belonged to 21-40 year age group; this is similar to a study conducted by Deshwal *et al* [4]. Meena, *et al* conducted a study of 100 patients with Dengue fever. According to age, maximum cases (29%) were in 21-30 years and rest (27%) were in 15-20 years, (21%) were in 31-40 years, (16%) were in 41-50 years and (7%) in 51- 60 years.[5] In a study conducted by Ahmed, *et al* on 205 subjects, it was observed the age range for dengue as 10-65 years and the mean age was 31.29 years (SD+13.65)[6]. Our findings are comparable to the above-mentioned studies.

Fever was the most common presentation (100%) which is similar to other studies from India and South East Asia [7-10]. Fever was followed by headache and myalgia. This is similar to Deshwal *et al* study.

The present study is novel in the aspect as it aims to recognize the changing trends in both clinical as well as laboratory profile of patients diagnosed to have dengue fever and compares the same between 2017 and 2019. The results have emphasized that the requirement of platelet transfusions and thereby the impending severity of the disease is on a downward trend.

5. Limitations

Serotyping for dengue virus was not done so the variations in clinical and platelet profile could not be attributed to specific serotype of dengue virus.

6. Conclusion

There is an overall decrease in severity of manifestations of dengue fever overtime with significant reduction in the patients suffering from dengue fever requiring platelet transfusions. Serotyping can be included as a routine workup for patients with dengue fever so as to improve prognostication.

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