Original Research Paper

General Medicine

STUDY ON THE CLINICAL AND HEMATOLOGICAL PROFILE OF DENGUE FEVER

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ABSTRACT **Background:** High grade fever (103-106°F), headaches, backaches, sharp painful joints, pain behind the eyes, nausea, vomiting, and a generalized erythematous rash are among the common symptoms of dengue. The febrile, critical, and recovery stages can be used to describe the disease's clinical course. WHO published a recommendation in November 2009 that categorizes symptomatic patients as severe dengue or dengue (with or without warning signs). **Method:** The present study was conducted under the Department of General Medicine, Rajshree Medical Research Institute, Bareilli. It was a Prospective cohort study conducted between February 2021 to July 2022. Study population comprised of those admitted in IPD in RMRI of 18-59 years of age, having fever more than 38.5oC with NS1 antigen positive or IgM dengue positive or both. **Result :** Out of 90 patients, studied that Vomiting are present in 51(56.7%) patients whereas 43.3% subjects do not had vomiting. Out of 90 patients, studied 54.4% study subjects had headache whereas it is absent in 45.6% patients. Out of 90 patients, studied that URI are present in 12(13.3%) patients.86.7% study subjects do not had URI. Abdominal pain are present in 8(8.9%) patients.,91.1% study subjects do not had abdominal pain. **Conclusion:** In this study, dengue infection affected a large portion of the young population and was more prevalent in men than in women. The bulk of the patients had fever. In addition to the typical headache, body aching, and fatigue, many patients also presented with gastrointestinal and respiratory symptoms such stomach discomfort, nausea, vomiting, diarrhea, and dry cough.

INTRODUCTION

The family Flaviviridae includes the genus Flavivirus, which includes the dengue virus. Although serotypes 2 and 3 have been linked to a higher number of severe cases and fatalities, the virus has multiple distinct viral serology types (Dengue 1, 2, 3 and 4) that have structural and pathogenic similarities. As a result, any of them might produce the severe forms of sickness. These viruses have a nucleocapsid core consisting of the viral genome and capsid (C) proteins. They are spherical particles with a diameter of 40 to 50 nm. Positive sense single stranded RNA bases make up this genome. The nucleocapsid is encased in the viral envelope, a membrane composed of a lipid bilayer derived from the host and including the proteins Envelope (E) and Membrane (M). They also contain additional non-structural (NS) proteins which are necessary for replication and assembly. (1)

High grade fever (103-106°F), headaches, backaches, sharp painful joints, pain behind the eyes, nausea, vomiting, and a generalized erythematous rash are among the common symptoms of dengue. The febrile, critical, and recovery stages can be used to describe the disease's clinical course. WHO published a recommendation in November 2009 that categorizes symptomatic patients as severe dengue or dengue (with or without warning signs).

High-grade fever (103 to 106 degrees Fahrenheit), a retro-orbital pain, a backache, severe joint and muscle pain, nausea, vomiting, and a widespread erythematous rash are all symptoms of dengue. The disease's clinical course can be described using the febrile, critical, and recovery stages. The World Health Organization (WHO) issued a proposal in November 2009 that would categorise symptomatic people as having severe dengue or dengue.

According to the WHO categorization system, the three subgroups of symptomatic dengue virus infections include ("dengue fever, dengue hemorrhagic fever (DHF), and dengue shock syndrome"). According to studies, DHF case definition missed a significant part of severe dengue cases, such as liver failure and encephalitis, because it was both too difficult to apply in resource-constrained settings and too specific. The 2009 clinical categorization was used as the new case definition as a result. Because there are several ways to meet the criteria for severe dengue and because nonspecific warning symptoms are used as diagnostic criteria for dengue, the 2009 clinical categorization has come under fire for being overly thorough. It has been criticised because the updated recommendations lack clinical criteria for identifying severe dengue, leaving severity decision to individual clinical judgement. These updated recommendations do, however, provide laboratory cut-off values for transaminase levels.

High fever (103 to 106 degrees Fahrenheit), a piercing pain in head and back, excruciating arthralgia and myalgia, pain behind eyeballs, nausea, vomiting, and broad erythematous rash are all signs of dengue. The disease's clinical course can be described using the febrile, critical, and recovery stages. WHO produced a recommendation in November 2009 that categorizes symptomatic patients as having severe dengue or dengue (with or without warning symptoms).

Dengue pathogenesis includes:

The principal DENV vector is thought to be the Aedes aegypti mosquito. By feeding on a person who is experiencing the viraemic stage of an infection, an Aedes aegypti mosquito can get infected. Before spreading to the salivary glands, the dengue virus initially infects the midgut cells and other tissues of the mosquito during the extrinsic phase of the cycle. An infected mosquito can then transfer the dengue virus to a number of humans when it feeds or tries to feed on them. In most cases, symptoms don't show up for 4 to 7 days after an infection, and a person can't spread the dengue virus to a new mosquito until then. Affected people and those who are asymptomatic can both spread of the dengue virus to mosquitoes. Dengue virus enters the body of the victim following a bite from an infected mosquito .The patient subsequently transitions into a viraemic phase, becoming febrile and infectious. Due to the patient's increased capillary fragility and leakage after that, they may either recover or develop severe dengue.(2)

Dengue fever is diagnosed using information from clinical, epidemiological, and laboratory sources.The presence of atypical lymphocytes and relative lymphocytosis prior to shock, changes in blood counts, hemoconcentration due to plasma leakage, changes in blood hemostasis with frequent hemorrhagic manifestations, and leucopenia due to decreased neutrophils are just a few of the haematological effects. (3)

With the above background this study was conducted To study the clinical and hematological profile of Dengue patients attending in OPD/ IPD of Rajshree Medical Research Institute and Hospital.

Materials and Methods

The present study was conducted under the Department of General Medicine, Rajshree Medical Research Institute, Bareilli. It was a Prospective cohort study conducted between February 2021 to July 2022.

Sampling technique: Random Sampling
Source of data: Study population comprised of those admitted in IPD

in RMRI of 18-59 years of age, having fever more than 38.5oC with NS1 antigen positive or IgM dengue positive or both.

INCLUSION CRITERIA-
1. Individuals having fever more than 38.5oC with Nonstructural protein 1(NS1) antigen positive or Immunoglobulin M(IgM)dengue positive or both on rapid card test.

2. Those admitted in In Patient Department (department of medicine) in RMRI with 18-59 years of age

EXCLUSION CRITERIA
1. Either younger than 18 or older than 60.
2. Considerable chronic liver, renal, or cardiac disease that is present.
3. Patient with any bleeding problem or disease history.
4. Patients who also had typhoid and malaria, two known disorders that coexisted with dengue fever.

Observations and Results
Age distribution of Study Population in years

Age	n=number of sample	Percent
18-32 Years	46	51.1%
33-47 Years	32	35.55%
48-59 Years	12	13.33%
Total	90	100%
Mean= 33.02, SD = 10.85		

Out of 90 patients, studied most of the patient comes in the 18-32 year age group (51.1%).followed by 35.55% in 33-47 yrs and 13.33% in 48-59 yrs, The mean age of the study subjects was 33.02±10.85 yrs

Out of 90 patients, studied mostly patients are male 51 (56.7%)., and rest 43.3% were female. Out of 90 patients, studied that 96.7% of the patients had fever less than 10 days and 3.3% subjects had fever since more than 10 days.
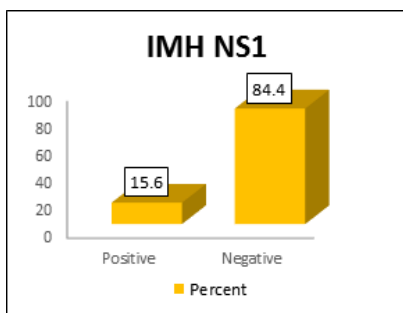
Out of 90 patients, studied that Vomiting are present in 51(56.7%) patients whereas 43.3% subjects do not had vomiting. Out of 90 patients, studied 54.4% study subjects had headache whereas it is absent in 45.6% patients. Out of 90 patients, studied that URI are present in 12(13.3%) patients.86.7% study subjects do not had URI. Abdominal pain are present in 8(8.9%) patients.,91.1% study subjects do not had abdominal pain.

Bleeding manifestation are not present in 75(83.3%) patients.12.2% study subjects had malena, 3.3% study subjects had bleeding gums whereas 1.1% had hematuria.

In the present study Ascites are present in 8(8.9%) patients.91.1% do not had ascites, Pleural effusion are present in 5(5.6%) patients.94.4% subjects do not had pleural effusion. Out of 90 patients, studied that GB walledema are present in 5(5.6%) patients, 94.4% subjects do not had Gb wall edema.

Out of 90 patients, studied that Thrombocytopenia are present in all patients i.e. 90(56.7%). IMH NS1 are present in 14(15.6%) patients.in 84.4% study subjects it is negative.

Figure 1: Figure showing percentage of IMH NS1 distribution

Out of 90 patients, studied that IMH IgM are positive in 11(12.2%) patients. Whereas in 87.8% subjects it is negative

Figure 2: Figure showing percentage of IMH IgM distribution
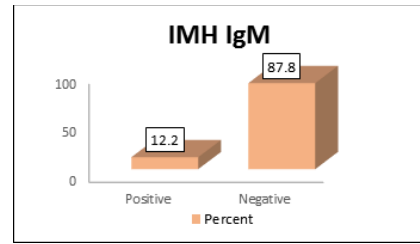
Discussion
Age and sex
In the 50 patients in the current study, 28 (56%) were men and 22 (44%) were women. In the age range of 11 to 20, there were a total of 2 cases (4%), 1 (3.6%) of which involved males and 1 (4.5%) involved females. 8 (28.6%) of the 12 (24%) cases in the age range of 21 to 30 years are male patients. 4 (18.2%) of the cases are female. In the age range of 31 to 40 years, there were 12 instances (24%) of which 6 (21.4%) and 6 (27.3%) were from males and females, respectively. Eight people (6%) in total fall into the 41–50 age range, with 5 (17.9%) men and 3 (13.6%) women, respectively. Six cases (24%) were in the 51–60 age range, with 4 (14.3%) and 2 (9.1%) of the cases being male and female, respectively.

Out of 58 patients recruited in the Abhinav Jain et al. (2013)(4) study, 34 (60%) men and 22 (40%) women made up the patient population. In a research by Abhija Babuji et al.(5) (2020), the majority of patients—55 (31.4%)—were between the ages of 21 and 30. Their average age was 37.18 years, however their ages ranged from 16 to 98. 112 (64%) of the 175 instances involved men, while 63 (36%) involved women. In a study by Abdur RafiID et al.(6) (2020), the majority of the patients were young adults, with a mean (SD) age of 33.0 (14.07) years and a 70% male patient population (age less than 40 years). In a study by Francisca Raimunda F. et al. (2011)(7), there were 72 men and 82 women participants. Ages ranged from 2 to 85, with 33.7% falling between 0 and 9 years old.

Clinical features
Among the 50 cases examined in the current study, 47 cases experienced fever, 31 headaches, 24 myalgias, 18 vomiting episodes, 11 diarrhea episodes, 22 cases experienced abdominal pain, and 4 cases experienced bleeding symptoms such as gum bleeding, subconjunctival hemorrhage, or melena. In a study by Abhinav Jain et al. (2013)(4), fever 56 (100%) and chills/rigors 49 (87%), myalgia 31 (55%) and headache 25 (45%) were the most common symptoms. In a study by Abdur RafiID et al. (2020)(6), myalgia (71.5%), headache (72.7%), and fever were the most common symptoms. The most typical warning symptom was vomiting (34.2%), which was followed by stomach discomfort (29.8%). The most frequent bleeding signs were petechiae or rash (15.7%), melena (11.9%), sub-conjunctival haemorrhage (8.8%), and gum bleeding (7.8%).

In a study by Anita Tahlan et al. (2017)(8), fever and headache were the most frequently noted clinical symptoms, while vomiting, diarrhea, and pain behind the eyes were considerably less frequent. None of the patients with positive serology reported any ecchymosis, melena, or hematemesis, or any other bleeding or hemorrhagic symptoms.

Laboratory results: Haematocrit (Hct) was found to be high in 38% of patients in the current investigation, while liver enzyme levels were elevated in 76% of cases. Leucopenia was seen in 60% of cases and thrombocytopenia was present in 88% of the research group.

Leukopenia (5000) (63.3%) and thrombocytopenia (100000) (30.4%) were the two most frequent hematological findings on admission in a study by Abdur RafiID et al (2020)(6). In total, 85 patients (26.6%) had hematocrits above 48 percent, whereas 74 patients (23.2%) had hematocrit increases over 20 percent. In a research by Anita Tahlan et al(8), leukopenia and thrombocytopenia were the most prevalent hematological abnormalities (2017).

When examined with ICT, there were 4 negative cases and 46 positive cases in the study group. Of these, 28 (56%) had both NS1 + IgM ICT, 32 (64%) had only IgM, and 42 (84%) had NS1 + IgM ICT. 48 of the 50 cases in the study group that were examined by ELISA were positive, and just 2 were negative. There were 86 percent of ELISA positive cases for NS1 solely, 66 percent for IgM only, and 56 percent for both NS1 and IgM.

Out of 66 samples tested in a study by Dr. Pramiladevi et al. (2013)(9) dengue was detected in 18 by fast test and 16 by IgM capture ELISA. 60 (38.9%) of the 154 serum samples analyzed in a study by N Sathish et al. (2003)(10) were positive by the MAC-ELISA test, whereas 35 (22.7%) were positive by the PanBio Rapid Immunochromatographic card Test. IgM ELISA produced 100% positive results in a study by Praewpilai Tontulawat et al.(9) (2011)(, however the IgM fast test only produced 76% (38/50) positive results.

Conclusions

In this study, dengue infection affected a large portion of the young population and was more prevalent in men than in women. The bulk of the patients had fever. In addition to the typical headache, body aching, and fatigue, many patients also presented with gastrointestinal and respiratory symptoms such stomach discomfort, nausea, vomiting, diarrhea, and dry cough. Leukopenia, leucocytosis, and normal TLC counts all appeared in the TLC count, which displayed a variety of patterns. This demonstrates that, even within the same location, dengue fever exhibits a variety of clinical presentations, atypical symptoms, and test results. Such unusual dengue presentations might delay diagnosis, which would increase mortality.

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