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STUDY OF CLINICAL AND HEMATOLOGICAL PARAMETERS IN PATIENTS WITH DENGUE FEVER AT TERTIARY HEALTH CARE CENTRE.

Pathology

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ABSTRACT

INTRODUCTION: Dengue is a mosquito borne Arboviral disease caused by the dengue virus. The global prevalence has grown dramatically[1] in the recent decades. The WHO estimates that 40% of the world's population (about 2.5 billion) living in the tropical and sub tropical areas are at risk
AIMS AND OBJECTIVES: To evaluate hematological changes in patients suffering from clinical manifestations of dengue with serological confirmation. To correlate hematological findings with the clinical findings and whether the progression could be predicted.
MATERIAL &METHOD- A commercially available Dengue NS1 Ag & Ab combi-card test kit is used to detect NS1 antigen and IgM and IgG antibodies. Evaluation of hematological and serological parameters is done by collecting 2 ml of sample on EDTA and plain bulb respectively.
RESULT- The study included 100 patients with seventy (60%) male and thirty (40%) female patients. The ages of the patients ranged from 12 to 75 years. Seventy patients were in the age group of 21 to 40 years. In this study the male to female ratio of patients was 2.3: The most common clinical features were fever. mean level of SGOT & SGPT were higher in those with shock than those without. . Sixty nine patients in this study had a platelet count of less than 50,000/μL at presentation.
CONCLUSION- The most common clinical features were fever, males are more commonly affected than female. Hepatic dysfunction was common in dengue fever. Thrombocytopenia is the most common hematological finding in patients with dengue infection..

KEYWORDS

INTRODUCTION:

Dengue is a mosquito borne Arboviral disease caused by the dengue virus. Its presentation is protean and varies from an undifferentiated viral syndrome to hemorrhagic fever and severe shock. It emerged among children in South East Asia[1]

The global prevalence has grown dramatically[1] in the recent decades. The WHO estimates that 40% of the world's population (about 2.5 billion) living in the tropical and sub tropical areas are at risk. Compared to the nine reporting countries in the 1950s, the disease is now endemic in 112 countries of Africa, the Americas, East Mediterranean, South East Asia and West Pacific.[1,2]

Dengue inflicts significant health, economic and social burdens on the populations of endemic areas. Globally, the estimated number of disability-adjusted life years (DALYs) lost to dengue in 2001 was 528[3].

Studies on the cost of dengue conducted in 8 countries (5 in the Americas, 3 in Asia) in 2005-06 showed that a treated dengue episode imposes substantial costs on the health sector.[2].

1. AIMS AND OBJECTIVES:

To evaluate hematological changes in patients suffering from clinical manifestations of dengue with serological confirmation. To evaluate the hematological and clinical stage at which Platelet transfusion is required in such patients. To correlate hematological findings with the clinical findings and whether the progression could be predicted.

MATERIAL AND METHODS :

Patients admitted at government medical college Aurangabad , a tertiary care hospital in Aurangabad , will be considered for this study.

A minimum of 100 cases will be undertaken, over a period of 1 year.

It is a prospective, non-interventional study in which evaluation of hematological parameters and peripheral smear studies are carried out.

- A commercially available Dengue NS1 Ag & Ab combi-card test kit is used to detect NS1 antigen and IgM and IgG antibodies. The test results are expressed as positives/negatives for antigen and both antibodies.

Evaluation of hematological and serological parameters is done by collecting 2 ml of sample on EDTA and plain bulb respectively.\

RESULT:

In the present study 100 patients of dengue infection requiring hospital admission due to hypotension, bleeding manifestations, organ impairment, pregnancy, or other co morbid conditions were included.

The study included 100 patients with **seventy (70%)** male and **thirty (30%)** female patients. The ages of the patients ranged from **12 to 75 years**. **Seventy** patients were in the age group of **21 to 40 years**, with 43 males (71.66%) and 17 females (28.33%) in this age group.
In this study the male to female ratio of patients was 2.3:1

Table No. 1: Comparison of Age and Sex in dengue fever

AGE (YRS)	MALE	FEMALE	TOTAL
1-20	9	6	15
20-40	48	22	70
40-60	4	6	10
60-80	4	1	5

The most common clinical features were fever (100%), athralgia & myalgia (98%), rash (85%), petechiae (90%), bleeding manifestations (75%).

Hemorrhagic manifestations were seen in seventy five patients, of which twenty patients had major bleeding manifestations (hematemesis, malena, bleeding per rectum, hemoperitoneum) and the rest had minor bleeding manifestations (ecchymosis, purpura, subconjunctival hemorrhage). Twelve patients had only petechiae but no other bleeding manifestations.

Table No. 2: Comparison of clinical presentation of dengue patients

CLINICAL FEATURES	NO OF PATIENTS(%)
Fever	100(100%)
athralgia & myalgia	88(88%)
Petechiae	80(80%)
Rash	75(75%)
Headhache	71(71%)
bleeding manifestations	63(63%)
Skin rash	58(58%)
Abdominal pain	33(33%)
Retroorbital pain	15(15%)
hepatomegaly	12(12%)
splenomegaly	6(6%)
Positive tornique test	70(70%)

A similar association was seen in this study. Twenty patients in the study group had severe hemorrhage. In sixty percent of these patients severe hemorrhage was associated with shock (40% had severe bleeding in the absence of shock). On statistical analysis of data it was seen that there was a significant association between shock and the presence of severe bleeding (p value =0.004) in the patients studied. This correlates with the findings of previous studies which indicate the presence of shock as a major determinant for the development of bleeding.

Table No. 3: Comparison of hematocrit at admission in patients with shock.
T-test
Group Statistics

Shock	N	Mean	Std Deviation	Std. Error Mean
HCT Admission	12	45.1250	9.0560	1.8485
with shock no shock	88	42.0000	5.5859	.8236

Hepatic dysfunction was seen in 64 patients with the rise in AST (SGOT) more than the rise in ALT (SGPT). Thirty Four patients had a serum bilirubin of more than 2 mg/dl. In the present study comparison of liver enzymes (AST and ALT) in the patients with shock and those without shock did not show a significant association. However the mean level of AST (SGOT) was higher (890.58) in those with shock than those without. Similarly mean ALT (SGPT) was higher (303.79) in patients with shock than those without shock (104.61). The mean AST (890.58) was higher than mean ALT (303.79) in both groups of patients. Severity of hepatic dysfunction was more in patients with shock, though it was not statistically significant.

Thirty six patients had serum creatinine values > 1.4 mg/dl, two patients had acute renal failure and required dialysis.

Sixty nine patients in this study had a platelet count of less than 50,000/µL at presentation. The mean platelet count at admission was 46,085/µl.

Table No.4 : Comparison of serial platelet counts in patients with positive tourniquet test.
Group Statistics

Torniquet test	No	Mean	Std. Deviation	Std. Error Mean
PLT Adm Negative Positive	15 85	67500.00 42516.67	53171.11 24161.53	16814.18 3119.24
PLT 24 hrs Negative Positive	15 85	74800.00 42766.67	47274.14 17506.77	14949.40 2260.11
PLT 72hrs Negative Positive	15 85	122000.00 87950.00	49396.36 34789.16	15620.50 4491.26

A comparison of the mean platelet count in patients with a positive tourniquet test at admission, 24 hours and 72 hours of hospital stay, revealed that mean platelet counts were lower in those with a positive tourniquet test. However, no statistically significant association was seen (P<0.05) between a positive torniquet test and the degree of thrombocytopenia.

None of the patients with severe hemorrhage had platelet counts <20,000/µl; 16 patients with severe bleeding had counts between 20,000-49,000/µl and four of these patients had a platelet count of> 50,000/µl. This shows that the platelet count does not correlate with the severity of bleeding.

DISCUSSION-
In the present study out of 60 patients, 30 (50%) were in age group of 20 to 30 years followed by 13 (21.6%) cases in the age group of 41 to 50 years, 10 (16.6%) cases in the age group of 31 to 40 years and 05 (8.3 %) cases with age 51 to 60 years, 02 (3.3 %) cases were in the age group of > 61 years ..

Deshwal, et al studied a total of 515 patients of Dengue. In their study too maximum patients were in 21-40 year age group (62.91%). Meena, et al.[7] (12 did a randomized 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 Vibha, et al. [11] studied 100 patients, and observed 49 (49%) to be in the 15 to 25 year age group followed by 33 (33%) cases in the 26 to 35.

The study included 100 patients with seventy (70%) male and thirty (30%) female patients.

and the male to female ratio was 2:1. Deshwal, et al.[4] and Vibha, et al[5]. too observed a male predominance in their studies with 72.8% and 70% male patients respectively. The male to female ratio was 1.7:1 in Vibha, et al.[5] study. In the study by Ahmed, et al. [8] the number of males was 193 (94.15%), while females were 12 (5.85%) with male to female ratio of 9:1 approximately. Meena, et al.[7] (n=100) also observed a male predominance with 63 cases (63%) and 37 (37%) female patients.

In the present study, fever was the most common presentation and was seen in 27 cases (45%) followed by fever and myalgia in 10 (6.6%) cases, 04 (6.65) respectively . In the study by Deshwal, et al.[4] fever was universal followed by headache (94.75%), myalgia (90.67%), conjunctival injection (39.41%), morbilliform skin rash (37.86%), abdominal pain (24.46%), retro-orbital pain (18.25%), itching predominantly localized to palmar and plantar aspects of hands and feet (13.39%). In the study by Vibha, et al.[5] 95 (95%) of the patients had fever as presenting symptom. Other symptoms were myalgia in 70 (70%) cases, arthralgia in 60 (60%) cases and headache in 50 (50%) cases.

40(40 %) cases showed hematocrit of 27-36% and 49 (49 %) showed hematocrit of 37-46%. Raised hematocrit (>47%) was noted in 11(11%) of patients at presentation. Dongre, et al. observed an increased hematocrit of > 40% in only 16 patients. Vibha, et al.[5] observed > 40% hematocrit in 28 (28%) cases. Deshwal, et al. [10] observed raised hematocrit of >47% in 20.7% of patients at presentation. In present study, hematocrit ranged from 20% to 51%.

16 patients with severe bleeding had counts between 20,000-49,000/µl and four of these patients had a platelet count of> 50,000/µl. This shows that the platelet count does not correlate with the severity of bleeding.

Sixty nine patients in this study had a platelet count of less than 50,000/µL at presentation. The mean platelet count at admission was 46,085/µl.

In the present study out of 100 cases of dengue fever, 69 (69 %) cases had thrombocytopenia, in which 16 (16%) patients had platelet count between 20,000-50,000/cumm, and 7 (7%) cases had < 20,000/cumm with bleeding manifestations. Deshwal, et al. [4] observed a platelet count of 50,000/cumm at presentation in 69.5% of cases. In their study minimum platelet count noted was 8,000/cumm. . Dongre, et al. [14] observed thrombocytopenia, platelet count <10,0000 in 112 patients. Six cases had counts less than 20000/cumm, 32 cases had counts between 20,000- 50,000/cumm, 42 cases had counts between 50,000-75000/cumm and 129 cases had counts more than 75000/cumm.

In Meena, et al. [12] study, (n=100), 90 (90%) cases had thrombocytopenia, in which 61 patients had platelet count between 20,000-60,000. Out of these 61 patients, seven patients (11.47%) had bleeding manifestation In the present study hepatomegaly was noted in 12 (12 %) and splenomegaly in 6 (6%) of all cases. Deshwal, et al. [10] too reported hepatomegaly in 14.75% and splenomegaly in 13.20% of their cases.

CONCLUSION-
The most common clinical features were fever, males are more commonly affected than female. Hepatic dysfunction was common in dengue fever. Thrombocytopenia is the most common hematological finding in patients with dengue infection..

The main focus in the management of dengue should be on preventing the development of shock and rapid correction of shock with careful i.v. fluid administration. The key is to maintain the blood pressure to prevent tissue hypoxia and organ dysfunction.

Platelet count does not correlate with severity of hemorrhage. In our study also we found the same. Though the role of platelet transfusion is controversial. From this study we can conclude that though prophylactic transfusions are unnecessary. Platelet transfusions may be of benefit in patients with thrombocytopenia (count < 20,000/mm^3) and hemorrhage, which continues despite blood transfusion.

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