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Original Research Article

Clinical and laboratory profile of dengue fever: a retrospective study

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ABSTRACT

Background: The global incidence of dengue has grown dramatically in recent decade. Half of world's population is now at risk. India represents significantly a larger burden, accounting for nearly 34% of the global burden of dengue infection. Dengue infection needs to be addressed as a single disease with different clinical presentations ranging from asymptomatic conditions to severe clinical courses that may lead to high morbidity and mortality.
Method: This was retrospective observational study carried out during period of July 2017 to April 2018, to study clinical profile and laboratory parameters in dengue fever patients. Confirmed dengue cases having NS1 positive or IgM positive or having both NS1 and IgM positive or dengue ELISA reactive, having minimum one CBC reports done and not having other confounding factor such as co-infection, bone marrow diseases etc. that may altered clinical and laboratory results are included in study. Statistical analysis was done by SPSS software version 18.0.
Results: Out of 48 confirmed dengue cases maximum patients 58.33% was from young age group (21 to 40 years) with M:F ratio was 2.43:1. Fever was found in 100% patients, in order of frequency followed by headache, bodyache, abdominal pain, weakness, retro-orbital pain, anorexia, dry cough, back pain, nausea, diarrhoea, vomiting, rash, joint pain, itching and malena.NS1was positive in 41.67% cases, dengue ELISA in 31.25%, IgM was positive in 20.83% cases, and both NS1 and IgM positive were in 4.17% cases. TLC count was low 35.42%, high in 12.50% of cases and remaining had normal TLC count. Platelet count was ranged between normal platelet counts to thrombocytopenia. One case had platelet count less than 20000. Out of 48 patients, 2 (4.17%) had malena.
Conclusion: In this study, fever was found in all patients, and headache, body ache and weakness were common symptoms, but significant number of patients also had gastroentstinal and respiratory symptoms like abdominal pain, nausea, diarrhea, vomiting and dry cough. TLC count ranging from normal TLC, leukopenia to leucocytosis. Large number of patients had low platelet count that shows dengue fever had varied clinical presentation.

Keywords: Clinical profile, Dengue fever, Dengue haemorrhagic fever, Laboratory profile, Retrospective study, Thrombocytopenia

INTRODUCTION

In 2012, report by World Health Organization (WHO) showed dengue ranks at the top as the world's most important mosquito born viral disease.[1] The global incidence of dengue has grown dramatically in recent decade. Half of world's population is now at risk.[2] 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.[3]

India represents significantly a larger burden, accounting for nearly 34% of the global burden of apparent dengue infection, with regular reporting of dengue outbreaks compared to other countries.[1] In India, every year cases are spreading to newer geographical areas. So not only is number of cases increasing as disease spreads to new area but explosive outbreaks are occurring. Also, all four dengue virus serotypes have been isolated from different parts of the country.[4] India contributed 6-9% of total cases in South-East Asian Region (SEAR) countries between 2009 and 2011, which has increased to 19% in 2013.[5]

The actual numbers of dengue cases are under reported and many cases are misclassified. One recent estimate indicates 390 million dengue infections per year (284-528 million), of which 96 million (67-136 million) manifest clinically (with any severity of disease).[6] Another study, of the prevalence of dengue, estimates that 3.9 billion people, in 128 countries, are at risk of infection with dengue virus.[7]

According to few recent studies, approximately 3.6 billion people are at risk of acquiring dengue infections, with approximately 230 million new infections every year, Including over 2 million cases of sever disease (DHF/DSS) and 21000 deaths.[1] Dengue infection needs to be addressed as a single disease with different clinical presentations ranging from asymptomatic conditions to severe clinical courses that may lead to high morbidity and mortality.[8] In the absence of a specific antiviral drug for dengue infection, it is a great challenge for the clinicians to recognize the severity of the disease at the early phase for early intervention and timely effective management to reduce complication and death.[3]

Dengue fever have changing distribution trend and variable clinical presentation which warrants need of constant study of clinical profile, laboratory parameters of dengue fever. So those better understandings of disease will reduce complications and mortality due to dengue. This was retrospective study with objective of which was to study clinical manifestations of all laboratory confirmed dengue cases admitted in nursing home, Aurangabad, Maharashtra.

METHODS

This retrospective observational study was carried out amongst 48 patients who were admitted between duration of July 2017 to April 2018 at nursing home, Aurangabad, Maharashtra, India.

Inclusion criteria was confirmed dengue cases having NS1 positive or IgM positive or having both NS1 and IgM positive or dengue ELISA reactive, having minimum one CBC reports done and not having other confounding factor such as co-infection, bone marrow diseases, cirrhosis of liver, history blood transfusion that may altered clinical and laboratory results.

Exclusion criteria was patients with NS1 and IgM negative, ELISA non-reactive for dengue, not having CBC report, having confounding factor such as co-infection, bone marrow diseases, cirrhosis of liver, history blood transfusion.

Statistical analysis

The collected data was compiled in MS-Excel 2007 sheet and Master sheet was prepared. For analysis of this data SPSS (Statistical Software for social Sciences) software version 18th was used. Qualitative data was represented in form frequencies and percentages. Quantitative data was represented in form of mean and SD.

RESULTS

As seen from Table 1 that out of total 48 cases were studied based on positive dengue test. Mean age of patients was 27.60+/-13.98, with range of 12 to 77 years. Out of total maximum number of patients i.e. 28 (58.33%) were fromage group of 21 to 40 years. Out of 48 cases 34 (70.83%) were males and 14(29.17%) were females and M:F ratio was 2.4:1.

As Table 2 showed that out of total cases, 40 (83.33%) had less than 5 days length of hospital stay and 8 (16.67%) have more than 5 days length of stay in hospital. Mean length of stay in hospital were 3.65+/-1.39, with range of 2 to 7 days.

It was observed from Table 3 that out of total cases, all (100%) had fever. 47(97.92%) had headache. 44 (91.67%) had body ache. 41(85.42%) had abdominal pain. 27(56.25%) had generalised weakness. 24(50%) had retroorbital pain. 14(29.17%) had dry cough and anorexia.12(25.00%) had backache. 11(22.92%) had nausea and diarrhoea. 09(18.75%) had vomiting. 04 (8.33%) had skin rash. 03(6.25%) had joint pain and 02 (4.17%) had malena and itching.

As Table 4 showed that out of 48 cases, 20(41.67%) cases were NS1 positive, 10 (20.83%) cases were IgM positive, 02 (4.17%) cases were both NS1 and IgM positive and 15(31.25%) cases were dengue ELISA positive.

Table 1: Age and sex wise distribution of study population (n=48).

Age group	No. of male	No. of female	Total	%
0-20 yrs	11	02	13	27.08
21-40 yrs	21	07	28	58.33
41-60 yrs	02	03	05	10.42
>60 yrs	00	02	02	4.17
Total (%)	34 (70.83%)	14(29.17%)	48	100%
Mean Age (Mean±SD) - 27.60±13.98		Range: 12 - 77		

Table 2: Length of hospital stay of study population.

Length of hospital stay	No. of patients	%
≤5 days	40	83.33
>5 days	08	16.67
Total	48	50
Mean Length of Stay (Mean±SD) =3.65±1.39 Range:2-7		

Table 3: Distribution of symptoms in dengue patients.

Symptoms	No. of cases (n=48)	%
Fever	48	100
Headache	47	97.92
Body ache	44	91.67
Abdominal Pain	41	85.42
Generalised weakness	27	56.25
Retro orbital Pain	24	50
Dry Cough	14	29.17
Anorexia	14	29.17
Back Pain	12	25.00
Nausea	11	22.92
Diarrhea	11	22.92
Vomiting	9	18.75
Rash	4	8.33
Joint Pain	3	6.25
Itching	2	4.17
Melena	2	4.17

In Table 5, out of total 48 cases, 31 (64.58%) had HB level between 11 to 16 gm%, 11 (22.92%) had HB level more than 16 gm%, 06 (12.50%) had HB level between 7 to 11 gm%. Mean of HB level was 13.54±2.34.Out of 48 cases,31(64.58%) had HCT% less than 45% and 17 (35.42%) had HCT% more than 45%.

Mean of HCT% was 41.63±6.58. Out of total cases, 25(52.08%) had TLC count between 4000 to 11000/103 µL.17(35.42%) had TLC count below 4000/103 µL.06 (12.50) had TLC more than 11000/103 µL. Mean of TLC count was 5528±3094. Mean of platelet count 121813±52685.

Table 4: Serology in Dengue fever patients.

Parameters	No. of dengue positive cases	%
NS1 Positive	20	41.67
IgG Positive	00	0.00
IgM Positive	10	20.83
Both Ns1 and IgG positive	00	0.00
Both Ns1 and IgM positive	02	4.17
Both IgG positive and IgM positive	01	2.08
All Positive	00	0.00
Dengue Eliza	15	31.25
Total	48	100

Table 5: Laboratory finding in dengue positive cases.

Investigations	Class interval	No. of cases (n=48)	%	Mean±SD
Hemoglobin (gm%)	7-11	06	12.50	13.54±2.34
	11-16	31	64.58	
	≥16	11	22.92	
Hematocrit (%)	<45%	31	64.58	41.63±6.58
	>45%	17	35.42	
Total Leukocyte Count (10^3µL)	<4000	17	35.42	5528±3094
	4000-11000	25	52.08	
	≥11000	06	12.50	
Platelet Count (per µL)	<20000	0	0.00	121813±52685
	20000-50000	5	10.42	
	51000-1 Lakh	13	27.08	
	>1 Lakh	30	62.50	

Table 6: Distribution of Platelet (per µL) in Dengue patients as per severity.

Reading in days	Severity of Disease		
	DF	DHF	DSS
<20000	0	0	0
20000-50000	4	1	0
51000-100000	12	1	0
>1Lakh	30	0	0
Total	46	02	0

As seen from Table 6 that all 48 cases had low platelet count, 5 (10.42%) had platelet between 20000 to 50000/ul, 13(27.08%) had platelet count between 51000 to 1 lakh/µL, 30(62.50%) had platelet count more than 1 lakh/µL. Two patients had DHF, one had platelet count between 20,000 to 50,000/µLand other had platelet count between 51000 to 1 lakh/µL.

DISCUSSION

Dengue infection is an acute infection caused by single stranded RNA virus belonging to genus Flavivirus. There are four serotypes of dengue virus. The infection is transmitted by the bite of Aedes aegypti mosquito. Incubation period ranges from 4 to 10 days. The illness progress through three phases these are febrile phase, critical phase and recovery phase. This study describes the clinical features and laboratory findings of dengue fever. In our study large number i.e. 58.33% of dengue cases are from young age group (21 to 40 years) with male:female ratio was 2.43:1.Similar findings were reported in Gupta et al and Dar es Salaam 2014 outbreak.[9,10] Males were affected more than females, this may due to males are more exposed to mosquitoes in outdoor activity. 83.33% of patients had less than 5 days stay in hospital and 8 (16.67%) have more than 5 days length of stay in hospital. Mean length of stay in hospital were 3.65+/-1.39, with range of 2 to 7 days.

In our study, fever was found in all (100%) patients, in order of frequency followed by headache (97.92%), body ache (91.67%), abdominal pain (85.42%), weakness (56.25), retro orbital pain (50%), anorexia (29.17%), dry cough (29.17%), back pain (25%), nausea (22.92%), diarrhoea (22.92%), vomiting (18.75%), rash (8.33%), joint pain (6.25%), itching (4.17%) and malena (4.17%). Abdominal pain was reported in 41% cases by Chhotal YH et al.[11] Similarly abdominal pain reported 38%by Sharma et al.[12] Gastroentestinal symptoms like abdominal pain was present in 41%, nausea in 22.92%, diarrhea in 22.92, and vomiting in 18.75% of study population, these manifestations may be due to liver injury. These findings were similar to Nimmagadda SS et al.[13] Incidence dry cough in our study was 14%, malena was observed in 2 patients. In this study, NS1was positive in 41.67% cases, dengue ELISA in 31.25%, IgM was positive in 20.83% cases, and both NS1 and IgM positive was in 4.17% cases. In few patients were NS1 and IgM antibody were negative, dengue ELISA was done which helped to diagnose patients who are suspected cases of dengue fever but initial screening test were negative.

In this study 64.58% had HB level between 7 to 11 gm%, 22.92% had HB level more than 16 gm%. Out of total, 35.42 % had HCT% more than 45% which suggest hemoconcentration probably due to dehydration. TLC count change showed variable patterns ranging from normal TLC toleukopenia and even some had leucocytosis. 35.42% had leukopenia, 12.50% had leucocytosis. In this study, platelet count change was ranged between normal platelet counts to thrombocytopenia but no case of thrombocytosis was encountered. No one had platelet count less than 20000/µL. Two patients of DHF were encountered in our study; both had platelet count between 20000 to 1 lakh/µL. This means although thrombocytopenia was common in dengue case but severity does not correlate with platelet count, this observation is similar to and the one made by Sharma et al.[10] In our study no mortality was found.

CONCLUSION

In this study, dengue infection was more common in males than in females and was commonly affecting young population. Fever was found in all patients. Headache, body ache and weakness were common presenting symptoms, but significant number of patients also had presenting symptoms in the form of gastrointestinal respiratory symptoms like abdominal pain, nausea, diarrhea, vomiting and dry cough. TLC count showed variable patterns, ranging from normal TLC count, leukopenia to leucocytosis. Large number of patients had low platelet count but few had normal platelet count also. That shows dengue fever has varied clinical presentation, atypical manifestations and laboratory findings in different epidemics, even in the same region. Such atypical presentations in dengue may lead to delay in diagnosis which may cause increased mortality. So to reduce mortality, we need to study clinical presentation and laboratory findings in dengue fever in every epidemic for early diagnosis and treatment.

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