ORIGINAL ARTICLE

A Retrospective Study on Laboratory Profile and Clinical Parameters of Dengue Fever Patients

AJEET KUMAR[1], SHAHNAWAZ SARWARI[2], WAHEED AHMED ARAIN[3], SURESH KUMAR[4], KANEEZ FATIMA[5], NAJEEB ULLAH ANSARI[6]

[1]Senior Medical Officer Medicine, Jalan Bani Bu Ali Oman
[2]Consultant Physician, District Head Quarters (DHQ) Hospital Badin Pakistan
[3]Consultant Physician, Combined Military Hospital Abbottabad Pakistan
[4]Senior Registrar Medicine, Bhitai Dental and Medical College Mirpurkhas Pakistan
[5]Senior Registrar Medicine, Isra University Hospital Hyderabad Pakistan
[6]Senior Registrar Medicine, Suleman Roshan Medical College Tando Adam Pakistan
Corresponding author: Ajeet Kumar, Email: niaz_h@hotmail.com, Cell: 0096896767480

ABSTRACT

Introduction: Over the past decade, the number of cases of dengue fever has augmented intensely globally. Half the world's population is now under threat. Pakistan has also very high dengue fever per year, with regular reports of dengue outbreaks compared to other countries. Dengue infection should be treated as a solitary ailment with various clinical pictures, vacillating from symptomless situations to severe clinical sequences, which may result in high mortality and morbidity.

Aim: To investigate the laboratory parameters and clinical profile in patients with dengue fever.

Study Design: A Retrospective observational study.

Place and Duration: In the Department of Medicine of Jalan Bani Bu Ali hospital Oman for one-year duration from July 2020 to July 2021.

Methods: At least IgM positive or NS1 positive or IgM with NS1 positive or reactive ELISA assay for dengue fever detection but without any co-infection, bone marrow disease confirmed the cases of dengue without other confounding factors, such as alteration of clinical and laboratory data. The results were analyzed for the study. SPSS 21.0 was applied for Statistical analysis.

Results: A total of 52 cases were tested positive for dengue fever. The patients mean age was 27.60 +/- 13.98 years and vacillated from 13 to 75 years. Of the total number of patients, 30 (57.69%) were in the age group 21 to 40 years. Of the 52 cases, 36 (69.23%) were male, 16 (30.77%) were female with M:F ratio was 2.2: 1. 42 (80.77%) of all cases were hospitalized for 5 days or less, and 10 (19.23%) were hospitalized for more than 5 days. The mean hospital stay was 3.67±1.40, ranging from 2 to 8 days. Fever was observed in all (100%) of the total number of cases.

Conclusions: In this analysis, all patients have fever, and body pain, headache and malaise were communal signs, but a substantial quantity of cases also had respiratory and gastrointestinal symptoms such as nausea, abdominal pain, vomiting, dry cough and diarrhea.

Keywords: Dengue fever, clinical profile, retrospective study, laboratory profile, thrombocytopenia

INTRODUCTION

In 2012, a World Health Organization (WHO) report showed that dengue fever ranks highest in the world as a mosquito-borne viral disease[1-2]. The worldwide prevalence of dengue fever has increased histrionically over the past decade. 50% of the world's populace is currently under threat. Dengue infection is the fastest rising vector-borne viral disease, with a thirty-fold surge in prevalence worldwide for the past five years[3-4]. It is an imperative community health issue in all subtropical and tropical regions of the entire biosphere. Pakistan has also very high dengue fever per year, with regular reports of dengue outbreaks compared to other countries. In Pakistan, more and more cases are spreading across geographies each year[5-6]. Therefore, as the disease spreads to a new area, the number of cases increases, but explosive epidemics also appear. In addition, four dengue serotypes have been isolated in different parts of the country. According to the latest estimates, 390 million dengue infections (285-529 million) annually, 9.6 billion (68-135 million) of which are present clinically with any disease severity symptoms[7-8]. One study on the dengue fever prevalence assessed that 38 million people in 127 states are at jeopardy of contracting virus of dengue. According to several recent studies, around 3.6 billion people are at risk of getting dengue infections, with around 230 million new infections each year, including over two million cases of serious disease (DHF / DSS) and 21,000 expiries[9-10]. Dengue infection should be treated as a solitary ailment with various clinical pictures, vacillating from symptomless situations to severe clinical sequences, which may result in high mortality and morbidity. In the absence of a specific antiviral drug for dengue infection, this poses a serious challenge for clinicians. Effective timely management for early diagnosis of disease severity for early intervention and reduction of complications and death[11-12]. Dengue fever has a variable distribution trend and a variable clinical picture, which justifies the need for further investigation of the clinical profile and laboratory parameters of dengue fever. Then a better understanding of the disease will reduce the complications and mortality associated with dengue fever[13]. This is a retrospective study to investigate the laboratory parameters and clinical manifestations of confirmed cases of dengue.

MATERIAL AND METHODS

This retrospective observational study was conducted among 52 patients admitted in the department of Medicine of Jalan bani bu Ali hospital Oman for one-year duration from July 2020 to July 2021.

Inclusion criteria were IgM or NS1 positive or IgM with NS1 confirmed cases of dengue and positive cases analyzed on ELISA test, with minimal one CBC reporting and no other confusing factors such as bone marrow disease, cirrhosis, co-infection, history of blood transfusion that may alter clinical and laboratory results. Exclusion criteria were patients with negative NS1 and IgM results, non-reactive ELISA for dengue, lack of a complete blood count report and confounding factors such as co-infections, bone marrow disease, cirrhosis, history of blood transfusion. The collected data was compiled on the MS-Excel 2007 website and the main page was prepared. SPSS 21.0 was applied for Statistical analysis. Qualitative data was articulated as percentage and frequency. The data Quantitative are presented as standard deviation and mean.

RESULTS

As shown in Table 1, a total of 52 cases were tested positive for dengue fever. The patients mean age was 27.60 +/- 13.98 years and vacillated from 13 to 75 years. Of the total number of patients, 30 (57.69%) were in the age group 21 to 40 years. Of the 52 cases, 36 (69.23%) were male, 16 (30.77%) were female with M:F ratio was 2.2: 1.

Table 1: Sex wise and Age distribution of study populace (n=52).

Parameters	No. of dengue positive cases	%
NS1 Positive	24	46.15
IgG Positive	00	0.00
IgM Positive	12	23.07
Both Ns1 and IgG positive	00	0.00
Both Ns1 and IgM positive	02	3.84
Both IgG positive and IgM positive	01	1.92
All Positive	00	0.00
Dengue Eliza	13	25.00
Total	52	100

As can be seen in Table 2, 42 (80.77%) of all cases were hospitalized for 5 days or less, and 10 (19.23%) were hospitalized for more than 5 days. The mean hospital stay was 3.67±1.40, ranging from 2 to 8 days.

Table 2: Duration of stay in hospital of study populace

Length of hospital stay	No. of patients	%
≤5 days	42	80.77
≤5 days	10	19.23
Total		
Mean Length of Stay (Mean±SD) =3.67±1.40 Range:2-8		

Table 3: Distribution of symptoms in dengue patients

Symptoms	No. of cases (n=52)	%
Fever	52	100
Headache	46	88.46
Body ache	45	86.53
Abdominal Pain	42	80.76
Generalised weakness	29	55.76
Retro orbital Pain	26	50
Dry Cough	15	28.84
Anorexia	15	28.84
Back Pain	13	25.00
Nausea	12	23.01
Diarrhea	12	23.01
Vomiting	10	19.23
Rash	5	9.61
Joint Pain	4	7.69
Itching	3	5.76
Melena	3	5.76

In Table 3, fever was observed in all (100%) of the total number of cases. 46 (88.46%) had headache. 45 (86.53%) had body aches. 42 (80.76%) had abdominal pain. 29 (55.76%) had general weakness. 26 (50%) had retroorbital pain. 15 (28.84%) had a dry cough and 13 (25.00%) had back pain. 12 (23.01%) had nausea and diarrhea. 10 (19.23%) admitted complaining of vomiting. 05 (9.61%) presented a skin rash. 04 (7.69%) had arthralgia, 03 (5.76 %) had melena and pruritus.

Table 4: Serology in patients affected with Dengue fever.

No. of Age group male		No. of female	Total %
0-20 yrs	10	04 14	26.92
21-40 yrs	22	08 30	57.69
41-60 yrs	04	02 06	11.53
>60 yrs	00	02 02	3.84
Total (%)	36 (69.23%)	16(30.77%) 52	100%
Mean Age (Mean ±SD) - 27.60±13.98		Range: 13 - 75	

As shown in Table 4, out of 52 cases, 24 (46.15%) cases were NS1 positive, 12 cases (23.07%) IgM positive, 02 cases

(3.84%) NS1 and IgM positive, and 13 cases (25%) positive ELISA for dengue.

HB ranged from 12% to 15 gm. The mean HB level was 12.10 ± 2.20. Of the 52 cases, 32 (61.54%) had HCT less than 45% and 20 (38.46%) had HCT greater than 45%. The mean% HCT was 42.58 ± 6.48. The TLC number ranged from 4000 to 11000/103 µl in all cases. The mean TLC number was 5530 ± 3088. The mean platelet count was 121690 ± 52770.

As can be seen in Table 5, low platelet count in all 52 cases. Two patients had dengue hemorrhagic fever, two had a platelet count between 20,000 and 50,000 / µl and the other one had a platelet count between 51,000 and 1 lakh / µl.

Table 5: 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	6	2	0
51000-100000	13	1	0
>1Lakh	30	0	0
Total	49	03	0

DISCUSSION

Dengue infection is an acute infection caused by a single-stranded RNA virus belonging to the genus Flavivirus[13]. There are 4 dengue virus serotypes. The infection is spread through the bite of the Aedes aegypti mosquito. 4 to 10 days is the incubation period. The disease has three stages: feverish stage, critical stage and convalescence stage. This study describes the clinical features and laboratory results of dengue fever. In our study, the majority of dengue cases (57.69%) were in young age (21-40 years), and the male-to-female ratio was 2.2: 1. In Dar es Salaam study outbreak in 2014, Men were more affected than women, possibly because men are more likely to get mosquitoes during outdoor activities[14-15]. 80.77% of patients stayed in hospital for less than 5 days, and 19.33% for more than 5 days. The mean hospital stay was 3.67±1.40, ranging from 2 to 8 days. Abdominal pain was reported in 41% of cases by Chhotal YH et al and Sharma et al study and 80.76% have abdominal pain in our study[16-17]. Gastrointestinal symptoms may be due to liver damage. These results were similar to those of Nimmagaddy SS et al[18]. In our study, the incidence of dry cough was 28.84%, and Malena occurred in 3 patients. In this study, 46.15% of the cases were NS1, 25% of the cases were Dengue positive by ELISA, 23.07% of the cases were IgM positive, and 1.92% of the cases were both NS1 and IgM positive. Several patients tested negative for IgM and NS1 antibodies, and a dengue ELISA was performed to help diagnose patients with suspected dengue, but the initial screening test was negative. In this study, HB ranged from 12% to 15 gm. The mean HB level was 12.10 ± 2.20. Of the 52 cases, 32 (61.54%) had HCT less than 45% and 20 (38.46%) had HCT greater than 45%. The change in TLC numbers showed varying patterns from normal TLC to leukopenia and some even had leukocytosis. In this study, although the change in platelet count differed between normal platelet count and thrombocytopenia, there were no cases of thrombocytosis[18-19]. Nobody had a platelet count below 20,000 / µl. Our study found two patients with dengue hemorrhagic fever; both had platelet counts between 20,000 and 1 lakh / µl. This suggests that although thrombocytopenia is common in dengue, but its severity is not related to platelet count, this observation was confirmed by Sharma et al. No mortality was found in our study[20-21].

CONCLUSION

In this analysis, all patients have fever, and body pain, headache and malaise were communal signs, but a substantial quantity of cases also had respiratory and gastrointestinal symptoms such as nausea, abdominal pain, vomiting, dry cough and diarrhea. TLC numbers range from standard TLC to leucocytosis and leukopenia. Many patients had low platelet counts, but very few also had

normal platelet counts. This indicates that dengue fever has different clinical symptoms, unusual symptoms, and laboratory test results in different epidemics, even in the same region. These unusual symptoms of dengue fever may delay diagnosis, which may result in increased mortality. Therefore, to reduce mortality, we must examine the laboratory parameters and clinical picture of dengue fever in each epidemic for early diagnosis and treatment.

REFERENCES

1. Deshwal R, Qureshi MI, Singh R. Clinical and laboratory profile of dengue fever. J Assoc Physicians India. 2015 Dec 1;63(12):30-2.
2. Shah GS, Islam S, Das BK. Clinical and laboratory profile of dengue infection in children. Kathmandu University medical journal (KUMJ). 2006 Jan 1;4(1):40-3.
3. Unnikrishnan R, Faizal BP, Vijayakumar P, Paul G, Sharma RN. Clinical and laboratory profile of dengue in the elderly. Journal of family medicine and primary care. 2015 Jul;4(3):369.
4. Rabbani MU, Aslam M, Zaheer MS, Ashraf MU. Clinical and Laboratory Profile of Dengue Fever in a North Indian Tertiary Hospital. The Journal of the Association of Physicians of India. 2018 Apr 1;66(4):37-9.
5. Sharma NL, Balasubramanyam V, Kandati J, Ponugoti M. Clinical and laboratory profile of dengue fever in children during an outbreak-one year study at tertiary care hospital, Chennai, Tamilnadu, India. Int J Contemp Pediatr. 2016 Dec 21;4(1):110-5.
6. Damodar T, Dias M, Mani R, Shilpa KA, Anand AM, Ravi V, Tiewsoh J. Clinical and laboratory profile of dengue viral infections in and around Mangalore, India. Indian journal of medical microbiology. 2017 Apr 1;35(2):256-61.
7. Shah I, Katira B. Clinical and laboratory profile of dengue, leptospirosis and malaria in children: a study from Mumbai. Archives of disease in childhood. 2007 Jun 1;92(6):561-.
8. Estofolete CF, Terzian AC, Parreira R, Esteves A, Hardman L, Greque GV, Rahal P, Nogueira ML. Clinical and laboratory profile of Zika virus infection in dengue suspected patients: a case series. Journal of Clinical Virology. 2016 Aug 1;81:25-30.
9. Daniel R, Philip AZ. A study of clinical profile of dengue fever in Kollam, Kerala, India.
10. Goweda R, Faisal A. A STUDY OF CLINICAL FEATURES AND LABORATORY PROFILE OF DENGUE FEVER IN OUTPATIENT SETTING. Malaysian Journal of Public Health Medicine. 2020 Oct 1;20(2):94-100.
11. Azeredo EL, Dos Santos FB, Barbosa LS, Souza TM, Badolato-Corrêa J, Sánchez-Arcila JC, Nunes PC, de-Oliveira-Pinto LM, de Filippis AM, Dal Fabbro M, Romanholi IH. Clinical and laboratory profile of zika and dengue infected patients: lessons learned from the co-circulation of dengue, zika and chikungunya in Brazil. PLoS currents. 2018 Feb 15;10.
12. Vanamali DR, Venugopal L, Yeshwanth P, Rampure D. A study on clinical, laboratory profile and outcome of dengue fever. Journal of evolution of medical and dental sciences. 2013 Dec 16;50(2):9739-43.
13. Singhal T, Kothari V. Clinical and laboratory profile of fatal Dengue cases at a tertiary care private hospital in Mumbai, India. The American Journal of Tropical Medicine and Hygiene. 2020 Sep;103(3):1223.
14. Uddin J, Asghar M, Shahzad A, Khan Z, Rehman N, Sharif N. Clinical and laboratory profile of Dengue fever in Khyber Teaching Hospital, Peshawar. Journal Of Medical Sciences. 2018 Dec 15;26(4):317-21.
15. Khurshid A, Syed A, Shafie AA, Yusuf E. Clinical manifestations and laboratory profile of dengue fever among the patient's general hospital, Penang. Archives of Pharmacy Practice. 2010;1(1):25-9.
16. Venkata Sai PM, Dev B, Krishnan R. Role of ultrasound in dengue fever. The British journal of radiology. 2005 May;78(929):416-8.
17. Villalon MR, Ramos M, Tiu JD. Clinical and Laboratory Profile of Dengue Fever in El-derly Patients Admitted in a Tertiary Hospital from 2013 to 2018. J Infect Dis Epidemiol. 2021;7:200.
18. Patil PS, Chandi DH, Damke S, Mahajan S, Ashok R, Basak S. A Retrospective Study of Clinical and Laboratory Profile of Dengue Fever in Tertiary Care Hospital, Wardha, Maharashtra, India. J Pure Appl Microbiol. 2020;14(3):1935-9.
19. Souza LJ, Pessanha LB, Mansur LC, Souza LA, Ribeiro MB, Silveira MD, Souto Filho JT. Comparison of clinical and laboratory characteristics between children and adults with dengue. Brazilian Journal of Infectious Diseases. 2013;17:27-31.
20. Ng WY, Ngim CF, Chow KY, Goh SX, Zaid M, Dhanoa A. Clinical manifestations, laboratory profile and outcomes of dengue virus infection in hospitalised older patients. Transactions of The Royal Society of Tropical Medicine and Hygiene. 2021 Nov 9.
21. Kuna A, Bykowska M, Kulawiak N, Biernat B, Szostakowska B, Nahorski WL, Pawlowski W, Chomicz L. Clinico-laboratory profile of dengue patients returning from tropical areas to Poland during 2010-15. Journal of vector borne diseases. 2016 Sep 1;53(3):234.