

CLINICAL AND HEMATOLOGICAL PROFILE OF PATIENTS WITH DENGUE FEVER

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ABSTRACT

Objective: To determine the clinical and hematological parameters in patients with Dengue fever

Materials and Methods: This descriptive study was conducted in the Dengue isolation unit of Lady Reading Hospital, Peshawar. All 205 patients admitted from from January 2011 to December 2013 with confirmed Dengue fever of either gender and all ages were enrolled in the study. Patients who were treated as Dengue fever on suspicion basis or mixed infections were excluded from the study. Data included patient gender, age, duration of febrile illness, skin rash, history of bleeding (from any site), length of hospital stay, Hemoglobin level, hematocrit, total leukocyte count, platelets count, presence of Malarial parasites, Dengue IgM / IgG serology (by Elisa), and NS1 antigen detection (in some cases). The relevant data parameters were analyzed using STAT A software version 2.0.

Results: The number of males was 31.29±13.65 years, while females were 12 (5.85%). Ages of patients were in the range of 10-65 years. Mean age was 31.29±13.65 years. The average duration of symptoms of these patients was 4-5 days, and hospital stay was 2.5 days. The history of typical rash and purpura was seen in 56 (28%) patients. Twenty-eight patients presented with history of some bleeding episode (13.9%). Dengue shock syndrome was seen in 2 patients. Dengue IgM antibodies were positive in all patients while IgG was positive in 34 cases (16.6%). NS1 antigen was done in 76 patients and was positive in 62 patients (81.6%). The Total Leukocyte count ranged from 1600 to 9000 /mm³, and mean TLC was 4283+1919 / mm³. The Platelets count ranged from 15000 to 271000, with mean of 69290 /mm³ +50820.5. The Hematocrit ranged from 33-49.1 % with a mean of 42% ±4.1.

Conclusion: This study highlights the clinical and laboratory features of Dengue fever and is intended to share these with the primary care clinicians to help them in managing such cases.

Key Words: Dengue, fever, hemorrhage, shock, syndrome.

INTRODUCTION

Dengue fever (DF) is an acute febrile viral disease frequently presenting with headaches, bone, joint and muscular pains, rash and leucopenia. It is also known as break bone fever¹. Dengue hemorrhagic fever (DHF) is characterized by four major clinical manifestations: high grade fever, hemorrhagic phenomena, often with hepatomegaly and, in severe cases, signs of circulatory failure. Such patients may develop hypovolemic shock resulting from plasma leakage. This is called dengue shock syndrome (DSS) and can be fatal². DHF is now a significant public health problem in most countries in the tropical areas of the South-East Asia and Western Pacific Regions³. The disease is among the ten leading causes of hospitalization and death in at least eight tropical Asian countries⁴.

Dengue fever has emerged as one of the major public health problem in Pakistan in recent years. The 2011 epidemic and beyond had created concerns about the efforts regarding the prevention and treatment of this disease at the country level⁵. This study will highlight the different clinical and laboratory features in patients with Dengue fever in a tertiary care hospital which will go a long way in guiding primary care physicians in diagnosing and managing such patients.

MATERIALS AND METHODS

This is a descriptive study with charts analysis of patients who were admitted in the isolation unit for Dengue fever in Lady Reading Hospital, which is the main referral center from all regions of Khyber Pakhtunkhwa and Afghanistan. The objective of the study was to determine the clinical and hematological parameters of patients suffering from Dengue fever and Dengue Hemorrhagic fever. All patients who were treated in the above mentioned unit were enrolled in the study. Patients were labeled as confirmed cases of Dengue fever on the basis of positive Dengue IgM

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Table 1: Showing the baseline characteristics of population

Gender			
Males	percent	Females	percent
193	94.15%	12	5.85%
Age range			
Max.	Min.	Mean	
65	10	31.29 +_ 13.65 SD.	
Total patients=205			

Table 2: Distribution of patients according to locality contracting the disease

Name of district /area	No. of patients & %age
Peshawar	145 (70.7%)
Swat and Malakand division	30 (14.6%)
Nowshehra	4 (1.95%)
Swabi	8 (3.9%)
Kohat	3 (1.5%)
Afghanistan	6 (2.9%)
Others	8 (3.9%)
Total	205

Table 3: Clinical presentation of patients admitted with Dengue fever

S. No.	Clinical presentation	Frequency & Percentage
1	Fever	201 (98%)
2	Rash	Petechae 29 (14%)
		Ecchymosis 11 (5.4%)
3	Bleeding episodes	28 (13.6%)
4	Shock	2 (0.97%)
5	Fluid sequestration	Pleural effusion 8 (3.9%)
		Pedal edema 9 (4.4%)
		ascites 3 (1.5%)
6	Altered consciousness	2(0.97%)
7	Need for ICU admission	10 (4.9%)
8	Number of deaths	2 (0.97%)

antibodies (by ELISA). Other supportive evidences were typical clinical features, leucopenia, and thrombocytopenia, with or without raised hematocrit depending upon the severity of illness. The recently introduced NS1 antigen test was done in patients who were admitted in 2013 epidemic.

The inclusion criteria were positive Dengue IgM antibodies (by ELISA) in the setting of typical history of

fever and purpuric rash, and included all age groups and both genders. Patients who were having mixed infections like Dengue fever and Malaria and where diagnosis was not confirmed were excluded from the study. All the relevant parameters including duration of illness, length of hospital stay, presence or absence of rash, leucopenia, thrombocytopenia, and hematocrit were analyzed with the help of STAT A software version 2.0. The study was approved by the institution research and ethics board.

RESULTS

The total number of confirmed Dengue fever patients admitted during the previously mentioned period was 205 and all patients were included in the study. The number of males was 193 (94.15%), while females were 12 (5.85%) with male to female ratio of 9:1 approximately. Ages ranged from 10-65 years (Table 1). Mean age was 31.29 years (SD±13.65). Patients belonging to Peshawar outnumbered and were 145 (70.7%), followed by 30 patients (14.6%) belonging to Swat district (Table 2). Representation from other districts and Afghanistan was minimal (14.7%).

The average duration of symptoms of these patients was 4-5 days, and mean hospital stay was 2.5 days. The history of typical rash and purpura was seen in 56 (28%). Twenty-eight patients (13.9%) presented with history of some bleeding episod. Dengue shock syndrome was seen in 2 patients and both died in intensive care unit (total mortality was 0.96%). Dengue IgM antibodies were positive in all patients while IgG was positive in 34 cases (16.6%). NS1 antigen was done in 76 patients and was positive in 62 patients (81.6%). The Total Leukocyte count ranged from 1600 to 9000 /mm³, and mean TLC was 4283+1919 / mm³. The Platelets count ranged from 15000 to 271000, with mean of 69290 /mm³ +50820.5. The Hematocrit ranged from 33-49.1 % with a mean of 42% +4.1 (Table 3).

DISCUSSION

Dengue fever is nowadays a frequent occurrence in almost all the major cities of our country mostly in summers around the moon-soon season⁶. The recent outbreak of this disease in district Swat is a warning sign that it may spread to minor cities and towns which can challenge the capabilities of primary care physicians in general and the health authorities in particular. It is important to mention that more than 95% of these patients gave history of visit to Punjab or Swat preceding the illness or transferred during the illness from those places.

Males predominated in our study (about 9:1), and it has been observed in other studies from Pakistan and India, and other South East Asian countries. This could be due to the fact that in these regions, males spend more time outdoors than females, thereby increasing the risk of exposure to mosquito bites⁷. However, a

study conducted in Vietnam revealed minor difference in male female ratio probably because of equal exposure to mosquito bites as their social and cultural difference from our culture⁸. Similar studies conducted in South America revealed equal gender distribution of this disease⁹.

The commonest indication for admission in patients who are suffering from Dengue fever is some form of hemorrhagic manifestation ranging from minor petechial rash to some major bleeding episode. The frequency of such episodes varies in different literatures. A study conducted in Lahore reported a prevalence of bleeding episodes of 56% which looks much higher in comparison to our study which is 33%¹⁰. A systematic review reported an incidence of 22-93% bleeding episodes of different severity in different studies¹¹.

The frequency of Dengue Shock Syndrome in our study is less than 1%. It ranges from 0.5 to about 2% in different literatures. Hospitals with highly trained staff and resources have reduced the incidence of Dengue shock syndrome to less than 0.3%^{12,13}.

Fluid sequestration is characterized by pedal edema, pleural effusion and ascites. It is mainly due to excess vascular permeability, and the true incidence varies. In western literature, it is shown to be about 34%¹⁴. This is in sharp contrast to our observation which is about 10%. The reason for this contrast could not be found. But the different Dengue virus serotypes may be the cause.

Neurological involvement is seen in dengue hemorrhagic fever, dengue shock syndrome, Acute Respiratory Distress Syndrome, and Disseminated intravascular coagulation. Its frequency in our study is about 1%, which is almost consistent with the results presented in international literature (1-3%). The mechanisms involved in the pathogenesis of encephalitis, encephalomyelitis, Guillaine Barre syndrome and motor paresis is not known. But it may be related to neurovirulence of the virus, metabolic and electrolyte derangements or other mechanisms¹⁵.

Mortality in Dengue infection is mostly related to hemorrhagic manifestations, fluid leakage and Dengue shock syndrome. Approximate mortality in dengue hemorrhagic fever and dengue shock syndrome is about 5%¹⁶. Out of 31 patients in our study, who had dengue hemorrhagic fever and dengue shock syndrome, 2 patients died (6.4%), which is slightly higher as described in international literature.

The recently introduces NS1 antigen detection test was used this year in our hospital. It was found positive in 68 of 76 cases of confirmed Dengue infection. It was found to be highly sensitivity, but it was less specific, as it was observed to be positive in other infections as well. It is in sharp contrast to previous studies where its specificity was reported to reach 100%¹⁷. Further studies are needed to evaluate these parameters.

In this study, not all the clinical and laboratory parameters were analyzed. Like liver enzymes, electrolytes and Creatinine were not included in the study. Similarly, the role of PCR in the diagnosis and different Dengue viral serotypes were not checked. The reasons were the non-availability of these tests at the local level and the meager financial resources. Further studies are needed to explore the relation of disease severity with factors like viral serotypes, population heterogeneity, and some other factors. The utility of NS1 Antigen in the diagnosis of Dengue fever should also be evaluated in further studies.

CONCLUSION

It is high time to train the primary care physicians and general practitioners to deal with the Dengue fever patients.

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