ORIGINAL ARTICLE

CLINICO-PATHOLOGICAL PROFILE OF PATIENTS OF DENGUE FEVER IN DISTRICT PESHAWAR

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ABSTRACT

Objectives: This study was conducted with the aim to highlight the clinic-pathological profile of patients with dengue fever in Peshawar.

Materials and methods: It was a cross-sectional study conducted at Khyber Teaching Hospital, Peshawar from September 2021 to January 2022. All cases with positive Dengue serology as done by ICT kit were included in the study. Cases with significant symptoms of Dengue but negative serology were excluded from the study. Clinical data and results of liver function tests were recorded. Mean and standard deviation was used for quantitative data while frequency and percentages were used for qualitative data.

Results: About 100 diagnosed cases of dengue fever were included. Seventy-four (74%) cases had dengue fever, while 24 (24%) cases had dengue hemorrhagic fever. About 2 (2%) cases had dengue shock syndrome. Serum Alanine transaminase level was abnormal in most of the cases.

Conclusion: The study reveals that the majority of the cases of dengue fever have mild to moderate disease. Severe disease was seen in a very small proportion of patients.

Keywords: Dengue hemorrhagic Fever, Liver Function Tests, Platelets count.

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INTRODUCTION

Dengue fever is a viral illness that is transmitted through mosquito bites. It has recently emerged as a disease of great concern as it is a massive burden on the healthcare system [1, 2].

Dengue fever can be mild or severe. World health organization (WHO) has categorized severe forms of disease into two entities, i.e. dengue hemorrhagic fever (DHF) and dengue shock syndrome (DSS) [3]. Literature suggests that the number of cases of dengue is gradually increasing globally. This is true, especially for tropical and subtropical countries [1, 4]. There are many causes of the increase in the incidence of dengue fever. Some of the causes of the increased incidence of dengue include poor hygiene of homes, increased urbanization, and frequent traveling of passengers from areas where dengue is prevalent to other areas of the world [1, 2].

The causative agent of dengue fever is Dengue virus. It comes off from Flavivirus family. This virus is known to have four types. The subtypes are designated as DEN 1, 2, 3, and 4 [5]. The virus is spread so extensively that all these four types can be found in any tropical and/or subtropical areas worldwide [1, 6]. Dengue virus is transmitted through the bite of the Aedes Aegypti mosquito. Another mosquito that is found to be involved in the transmission of the virus is Aedes albopictus [3, 7, 8]. However, the latter is rarely involved.

Dengue virus is a single-stranded RNA virus. The single strand of RNA is actually the genome of this virus. It is an enveloped virus and it has an icosahedral shape. The virus encodes three types of proteins, i.e.: precursor membrane, envelope E, and capsid proteins. In addition to these, there are certain other proteins that are encoded by the virus; one of them is called NS1. It is used in the detection of the virus in the human body [1, 9].

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The dengue virus causes dengue fever. The WHO has classified the disease into three types, i.e.: dengue fever, dengue hemorrhagic fever, and dengue shock syndrome [10, 11]. Dengue fever presents as fever, shivers, body aches, and pain behind the eyes [3]. There is a low platelet count and there are bruises and purpura on the skin. In severe cases, there can be frank hemorrhage from body orifices. This happens only if the disease recurs in the same patient and is then referred to as dengue hemorrhagic fever [3]. The organ most commonly affected is the liver. The disease may present in many different ways. Usually, it is asymptomatic clinically, in which case only the transaminase levels are increased. In other extreme cases, the patient may present with acute liver failure.

In Pakistan, the dengue virus has spread in almost all parts of the country. Cases begin to appear after a rainy period of monsoon. The incidence has further increased after floods in some areas of the country [12]. This study was done to find the prevalence of dengue in Peshawar, and find the clinic-pathological profile of patients having dengue fever.

MATERIALS AND METHODS

It was a descriptive cross-sectional study. About 100 diagnosed cases of dengue fever at Khyber Teaching Hospital, Peshawar were included in the study. The study was conducted from September 2021 to January 2022. Ethical approval for the study was obtained. The blood counts were done by Sysmex X21 analyzer. COBAS 501 was used for doing Chemistry.

Diagnosed cases of dengue fever, of both sexes and all ages, were included in the study. The diagnosis was confirmed by if there was a positive NS1 antigen or IgM serology. A cut of less than 4000 $\times$ 10^9 /L leukocytes was taken for leukopenia.

A cut-off of less than 150 $\times$ 10^9/L was taken to define thrombocytopenia. The dengue fever cases were categorized as Dengue Fever, Dengue Hemorrhagic Fever, and Dengue Shock Syndrome as per World Health Organization (WHO) criteria [10, 11].

Cases with negative NS1 Negative Antigen and non-consenting participants were excluded from the study. Five ml of blood was taken and serum was used to determine ALT, Bilirubin, Creatinine, Urea, and Sodium. Statistical Analysis was done by SPSS-22.

RESULTS

A total of 44 males and 56 females were included in the study. The severity and outcomes of dengue fever are shown in Tables 1 and 2, clinical features in table 3, platelet count in table 4, and TLC in Figure 1. Changes in immunological and laboratory parameters are shown in Tables 5 and 6.

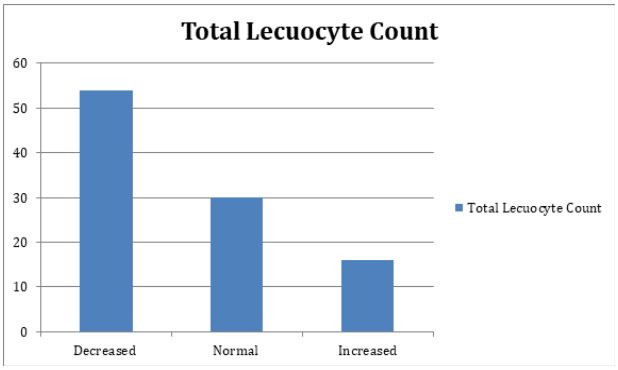

Fig 1: Changes in Total leukocyte count in cases of dengue fever

Table 1: Distribution of dengue fever among the study sample.

Dengue subtypes	n (%)
Dengue fever	74(74%)
Dengue hemorrhagic fever	24(24%)
Dengue shock syndrome	2(2%)

Table 2: Outcome of Dengue in study sample

Outcome	n (%)
Patients alive/ survived	98(98%)
Patients dead	2(2%)
Dengue shock syndrome	2(2%)

Table 3: Clinical features of study participants

Clinical features	n (%)
Fever	98 (98%)
Malaise	92 (92%)
Vomiting	90 (90%)
Weakness/fatigue	86 (86%)
Anorexia	84 (84%)
Muscle pain	80 (80%)
Joint pain	76 (76%)
Chills and rigors	72 (72%)
Abdominal pain	64 (64%)
Headache	62 (62%)
Retro orbital pain	62 (62%)
Nausea	58 (58%)
Skin rashes	50 (50%)
Pruritus	38 (38%)
Sore throat	30 (30%)
Epistaxis	24 (24%)
Diarrhea	22 (22%)
Cough	8 (8%)
Hypertension	6 (6%)
Gastritis	2 (2%)
Splenomegaly	2 (2%)
Hepatomegaly	%2) 2)

Table 4: Platelet counts in patients of dengue fever

Platelet count (106/L)	n (%)
Less than 50,000	84(84%)
50,000-1,49000	13 (13%)
Above 1,50000	3(3%)

Table 5: Results of Positive and Negative Immunoglobulin

immunoglobulin	Positive (%)	Negative (%)
Ig M	70 (70%)	30 (30%)
Ig G	40 (40%)	60 (60%)

Table 6: Changes in Laboratory parameters in cases of dengue fever

Laboratory parameters in dengue cases	Increased n (%)	Decreased n (%)	Normal n (%)
Serum Alanine Transaminase	89 (89%)	-	11 (11%)
Serum Bilirubin	7 (7%)	-	93(13%)
Serum Sodium	3 (3%)	2(2%)	95 (44%)
Serum Urea	59 (59)	-	41 (41%)
Serum Creatinine levels	11(11%)	-	89 (89%)

DISCUSSION

The current research sheds light on clinical and pathological features and the death rate of patients with dengue fever in the district of Peshawar. Studies showed that there was male predominance as compared to females. The data also showed that most of the patients of dengue in Peshawar had only a milder form of the disease. These findings are comparable to that done by Rehman MZ in 2017 [13].

The cause for male predominance can be due to the fact that males are more likely to get health care as compared to females in our setup. Males are more prone to mosquito bites due to being exposed in workplaces. In the current study, it was revealed that dengue fever was commoner as compared to dengue hemorrhagic fever and dengue shock syndrome. This finding is the same as that reported in the study of Rehman et al [13].

When hematological parameters were considered in dengue patients, it was found that platelet counts were low in the majority of the patients while total leukocyte count was decreased in most of the patients, Similar findings are reported by studies done by Nagaram PP and Hassan Z [14, 15].

When chemical parameters were analyzed in cases of dengue fever, it was seen that alanine transferases and urea were raised in most of the patients but creatinine, serum sodium, and bilirubin were normal in the vast majority. Similar findings were reported by previous studies [16-18].

CONCLUSION

Dengue fever presents a wide variety of clinical and pathological features. Changes in hematological parameters include low platelet count and decreased total leukocyte count. Changes in chemical parameters include increased levels of serum urea and alanine transaminase.

REFERENCES

1. Guzman MG, Halstead SB, Artsob H, Buchy P, Farrar J, Gubler DJ, et al .Dengue: a continuing global threat. Nat Rev Microbiol 2010; 8: [S7-16].
2. Guzmán MG, Kourí G. Dengue: an update. Lancet Infect Dis 2002; 2: 33-42.
3. WHO. Dengue: guidelines for diagnosis, treatment, prevention and control, Geneva, 2009.
4. Thomas SJ, Strickman D, Vaughn DW. Dengue epidemiology: virus epidemiology, ecology, and emergence. Adv Virus Res 2003; 61:235-89.
5. Westaway EG, Brinton MA, Gaidamovich SY, Igarashi A, Kääriäinen L, Lvov DK, et al . Flaviviridae. Intervirology 1985; 24: 183-92
6. Wang E, Ni H, Xu R, Barrett AD, Watowich SJ, Gubler DJ, et al. Evolutionary relationships of endemic/epidemic and sylvatic dengue viruses. J Virol 2000; 74: 3227-3234.
7. Bäck AT, Lundkvist A. Dengue viruses - an overview. Infect Ecol Epidemiol 2013; 3:31-6.
8. Ooi GD. Dengue virus-mosquito interactions. In: Hanley KA, Weaver SC, editors. Frontiers in dengue virus research. Norfolk, UK: Caister Academic Press, 2010: 143-56.
9. Pang X, Zhang M, Dayton AI. Development of dengue virus replicons expressing HIV-1 gp120 and other heterologous genes: a potential future tool for dual vaccination against dengue virus and HIV. BMC Microbiol 2001; 1: 28.
10. WHO. Dengue Hemorrhagic Fever: Diagnosis, Treatment, Prevention and Control, Geneva, 1997
11. Lee LK, Gan VC, Lee VJ, Tan AS, Leo YS, Lye DC. Clinical relevance and discriminatory value of elevated liver aminotransferase levels for dengue severity. PLoS Negl Trop Dis 2012; 6: e1676 .
12. Martina BE, Koraka P, Osterhaus AD. Dengue virus pathogenesis: an integrated view. Clin Microbiol Rev 2009; 22: 564-81.
13. Rehman MZ, Mustafvi SA. Clinical and laboratory profile of dengue fever patients admitted in combined military hospital Rawalpindi in the year 2015. Pak Armed Forces Med J. 2015 2017; 67 (4):496-501.

14. Nagaram PP, Piduru P, Munagala VK, Matli VV. Clinical and laboratory profile and outcome of dengue cases among children attending a tertiary care hospital of South India. 2017. ;4(3):7. Epub 2017-04-25.

15. Hasan Z, Razzak S, Farhan M, Rahim M, Islam N, Samreen A, et al. Increasing usage of rapid diagnostics for Dengue virus detection in Pakistan. J Pak Med Assoc. 2017 2017/04//;67(4):54851.

16. Kim Lien PT, Duoc VT, Gavotte L, Cornillot E, Nga PT, Briant L, et al. Role of Aedes aegypti and Aedes albopictus during the 2011 dengue fever epidemics in Hanoi, Vietnam. Asian Pac J Trop Med. 2015:8(7):543-8.

17. Suleman M, Faryal R, Aamir UB, Alam MM, Nisar N, Sharif S, et al. Dengue outbreak in Swat and Mansehra, Pakistan 2013: An epidemiological and diagnostic perspective. Asian Pac J Trop Med.2016;9(4):380-4.

18. Suleman M, Lee H-W, Zaidi SSZ, Alam MM, Nisar N, Aamir UB, et al. Preliminary Seroepidemiological survey of dengue infections in Pakistan, 2009-2014. Infectious Dis Pov. 2017 ;6(1):48.

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AUTHOR'S CONTRIBUTION

Following authors have made substantial contributions to the manuscript as under

Idrees M: Conception, literature search and overallsupervision

Hussain Z: Data handling and critical analysis

Qayyum S: Manuscript drafting

Riaz H: Statistical Analysis, Literature review

Waqas M: Bibliography

Khan MI: Data Collection

Authors agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.