DENGUE FEVER ASSOCIATED WITH CLINICAL AND LABORATORY PROFILE OF PATIENTS IN DISTRICT PESHAWAR

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ABSTRACT:

OBJECTIVES:

This study aims to evaluate the clinical and laboratory profile of dengue patients attending the teaching hospitals in Peshawar, Pakistan.

METHODOLOGY:

Patients from different regions of Khyber Pakhtunkhwa with suspected DF infection admitted at Khyber Teaching Hospital and Kuwait Teaching Hospital, Peshawar from October 2017 to January 2018 were included in this study. A total of 50 patients both males and females were included. Hematology Analyzer Sysmex X21 for Complete Blood Count (CBC), COBAS 501 for Chemical Analysis and Immunochromatographic Diagnostic Test (ICT) kits were used in this study. Inform consent was taken from the patients and debriefed. Statistical analysis was performed by using SPSS version 22.

RESULTS:

Seventy four Percent dengue patients were suffering from dengue fever (DF) followed by 24% of patients with dengue hemorrhagic fever (DHF) and only 02% with dengue shock syndrome (DSS). Most of the patients with abnormal blood chemistry.

CONCLUSION:

Our findings suggest that these patients have mild to moderate form of Dengue Fever and severity was observed in only few cases.

KEYWORDS: *Dengue Fever, Liver Function Tests, Platelets Count, Hepatomegaly, Viraemia*

How to cite this article:
Idrees M. Dengue Fever Associated with Clinical and Laboratory Profile of Patients in District Peshawar. J Wazir Muhammad Inst Paramed Tech. 2021;1(1): 2-6

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INTRODUCTION:

Dengue is one of the important causes of febrile diseases in the subtropical and tropical areas. Malaria and dengue are mosquito-transmitted illnesses which globally causes the arboviral illness[1,2]. World Health Organization (WHO) categorized the —severe denguell as Dengue Hemorrhagic Fever (DHF) and Dengue Shock Syndrome (DSS) in 2009[3]. The dengue symptoms are fever, ocular pain, headache, muscle or joint pains, cutaneous rash, bleeding manifestations and reduced leukocyte count. The average number of dengue reported per annum has amplified radically. In spite of the scarce surveillance of patients diagnosed from the tropical underdeveloped countries[1,4]. The reasons could be the persistent development with unhygienic conditions, decrepit health arrangements which could lead the illness load subsequently[2]. The most common affected organ in this disease is the liver. dengue has almost entire properties of a hepatic disease initiating from asymptomatic raised transaminase points to Acute Liver Failure (ALF). The Dengue Virus (DENV) is

categorized into four serotypes which belongs to Flaviviridae family and genus Flavivirus[5]. Globally, all of them are subtle in subtropical/tropical areas[1,6]. This dengue virus can be spread through the species Aedes Aegypti, or Aedes Albopictus. The Aedes Aegypti mosquito (anthropophilic nature) often bites several times before finishing oogenesis as it is adapted for urban thriving[3, 7]. Throughout the 5-day retro of human viremia, it taints the host and moves from mid-gut to the salivary glands of the insect. The life-cycle of dengue virus inside the mosquito after eight to twelve day, under high temperatures, the mosquito turn out to be infectious, and can spread the virus to another host[1, 3]. Mosquito cell cultures with persistent infection can be exhibited with high concentrations of virus[8]. Dengue virus is an RNA virus with a single-stranded positive-sense RNA acting as the genome, having an envelope and icosahedral in shape. The virus also encodes for seven non-structural (NS) proteins one of which (NS1) has found use as a diagnostic antigen in initial phases of the disease. The E glycoprotein plays a crucial role in the biology of the DENV, starting from receptor binding to immune response[1,9]. World Health Organization categorized the dengue into dengue fever (DF), dengue hemorrhagic fever (DHF) and dengue shock syndrome (DSS)[10,11] High Fever, thrombocytopenia (≤100×109/L), bleeding manifestations, evidence of plasma leakage, tachycardia and low pulse pressure (<20 mmHg)[3]. Dengue virus is now endemic in Pakistan, circulating throughout the year with a peak incidence in the post monsoon period. Recent flood in Pakistan made the situation worse. With DENV infection, high level of viraemia is linked with engrossment of various human organs (liver, brain) when it is severe[12]. This study aims to find out the clinical/laboratory profile of patients suffering from dengue fever at KPK province of Pakistan. The study also attempts to find out the incidence of Dengue Fever (DF), Dengue Hemorrhagic Fever and Dengue Shock Syndrome (DSS) in Khyber Pakhtunkhwa, Pakistan.

METHODOLOGY:

Patients from different regions of Khyber Pakhtunkhwa especially Peshawar with suspected DF infection admitted and treated at Khyber Teaching Hospital and Kuwait Teaching Hospital Peshawar from October 2017 to January 2018 were included in this study. Prior to the study, approval from the Research Committee Chairman of Gandhara University Peshawar, Department of Medical Laboratory Technology (MLT), Wazir Muhammad Institute of Paramedical Technologies (WMIPT) was taken. Materials and equipment that were used includes Hematology Analyzer Sysmex X21 for Complete Blood Count (CBC), COBAS 501 for Chemical Analysis, syringes, alcohol swab, tourniquet, and Immunochromatographic Diagnostic Test (ICT) Kits. Machines were fully automated equipped with barcode reading system. In this cross-sectional study, a total of 50 patients both males and females were included. Cases of dengue were selected irrespective of age and sex. On the basis of following clinical findings; fever associated with chills and rigors, headache, myalgia, retro orbital pain, vomiting, weakness and fatigue, Pruritus, skin rashes, joint pain, diarrhea, abdominal pain, anorexia, malaise and any other symptoms and laboratory profile i.e. leucopenia, thrombocytopenia or circulatory collapse in whom tests for dengue fever, NS1 antigen or IgM serology or both were positive. Leucopenia was defined as total white cell count less than 4000×109/L and thrombocytopenia if platelet count was less than 150×109/L. The dengue fever cases were further sub-classified into DF, DHF and DSS according to World Health Organization (WHO) definition criteria of dengue infection[10,11]. Patients having same sign symptoms but diagnosed with NS1 Negative Antigen were excluded from the study. The blood was collected aseptically. The area was cleaned with antiseptic such as 70% Alcohol (Alcohol swab) before pricking. Venous blood samples were collected through venipuncturing technique in Gel Tubes and Ethylenediamine tetra-acetic acid (EDTA) Tubes. After collection samples in the Gel Tubes were centrifuged at 4500 rpm for 05 minutes to separate serum. EDTA tubes were placed on mixer for 5 minutes. Samples were labeled with the patient registration number and detail i.e. age, sex along with history of each individual. Samples were stored at 25-30°C. For chemical analysis, analyzer used was COBAS 501 from Roche Diagnostic, which works on the principle of Electric Photometer. Hematology analyzer, Sysmex

X21 used works on the principle of fluorescent flow cytometer. ICT kits works on principle, high specific affinity of an antibody for its antigen. It detects the distribution of a given protein or antigen in tissues or cells. Statistical analysis was performed by using SPSS version 22. Descriptive statistics were used to analyze the data.

RESULTS:

In our study, 28 (56%) were males and 22 (44%) were females.

Table 1: Platelets Count in Dengue (DF, DHF, DSS) Patients (Onset)(n=50)

Platelet Count 10^9/L	DF	DHF	DSS	Total
<50000	13 (26%)	12 (24%)	01 (02%)	26 (52%)
50000-100000	13 (26%)	-	-	13 (26%)
100000-150000	09 (18%)	-	-	09 (18%)
150000-20000	02 (04%)	-	-	02 (04%)
>200000	-	-	-	-

Table 2: IgM and IgG Results (Onset) (n=30)

Results	IgM (n=30)	IgG(n=30)
Positive	21 (70.0%)	12 (40.0%)
Negative	09 (30.0%)	18 (60.0%)

Table 3: TLC Count in Dengue (DF, DHF, DSS) Patients (Onset) (n=50)

TLC Count/ cmm	Gender			DHF	Total Patients
	Male	Female	DF		
1.1-2.0	01	01	01	01	02
2.1-3.0	03	06	06	03	09
3.1-4.0	09	03	08	03	12
>4	13	14	22	05	27
Total	26	24	37	12	50

Table 4 : Clinical Signs and Symptoms of Dengue Patients (n=50)

Signs/Symptoms	Onset of Disease	After one Month
Fever	49 (98.0%)	38 (76.0%)
Malaise	46 (92.0%)	26 (52.0%)
Vomiting	45 (90.0%)	30 (60.0%)
Lethargy/Weakness	43 (86.0%)	35 (70.0%)
Anorexia Myalgia	42 (84.0%)	15 (30.0%)
Joint Pain/Arthralgia	40 (80.0%)	28 (56.0%)
Chills/Rigors	38 (76.0%)	13 (26.0%)
Abdominal Pain	36 (72.0%)	10 (20.0%)
Headache	32 (64.0%)	32 (64.0%)
Retro Orbital Pain	31 (62.0%)	04 (08.0%)
Skin Rashes	29 (58.0%)	34 (68.0%)
Pruritus	25 (50.0%)	07 (14.0%)
Sore Throat	19 (38.0%)	28 (56.0%)
Bleeding	15 (30.0%)	05 (10.0%)
Diarrhea	12 (24.0%)	08(16.0%)
Sweating	11 (22.0%)	05 (10.0%)
Cough	08 (16.0%)	05 (10.0%)
Hypertension	04 (08.0%)	06 (12.0%)
Gastritis	03 (06.0%)	02 (04.0%)
Vasoconstriction	01 (02.0%)	02 (04.0%)
Spastic Neck Pain	01 (02.0%)	-
Dyspepsia	01 (02.0%)	02 (04.0%)
Splenomegaly	01 (02.0%)	-
Hepatomegaly	01 (02.0%)	-

DISCUSSION:

Our study describes the clinical features, investigations, and outcome of dengue fever in patients. According to the report of World

Health Organization (WHO) annually 50-100 million dengue infections occur and estimated that two-fifths of the world population is at risk of this infection[12]. In china[13], the dengue fever was categorized by the fever (98.1%), headache (75.7%), malaise (76.0%), and asthenia (74.3%); bleeding (25.8%), plasma leakage (8.3 %) and hepatosplenomegaly (17.5%) were reported. A study was conducted to evaluate the persistent symptoms of dengue in patients and they reported that fever, dermatological manifestations, and pain were the most persistent symptoms and after the one month of onset the 55.7 percent patients had dengue related complaints[14]. Similarly, other studies also reported higher persistency of symptoms after the onset[15]. In our study, most of the symptoms including fever (76.0%), vomiting (60.0%), Lethargic/weakness (70.0%), joint pain (56.0), skin rashes (68.0%), sore throat (56.0%) and headache (64.0%) were reported after one month of the onset. In this study it is noted that mostly patients have dengue fever (DF) and a study conducted in Rawalpindi by Rehman et al also reported the similar findings[16]. A Study showed that mostly patients have dengue fever which is the (24%) of study population followed by DHF patients (08%)[17]. In our study, (26%) of the patients had dengue fever and (24%) had DHF. The patients having platelets count less than 50000 were maximum in number (52%) with the males in predominance. A total of 30 patients were IgM positive (70%) compared to IgG positive patients (40%). Patients with TLC count above 4000 were 14 females and 15 males and most of them have DF and this strengthens the earlier findings[18,19]. Our results further show that the blood chemistry of these patients was abnormal, and it support the previous results[20,21].

CONCLUSION:

Our findings suggest that patients had a mild to moderate presentation of dengue fever with persistence dengue symptoms last up to one month. Understanding the risk factors helps in predicting the mortality, which helps in management and better outcome of the fever.

CONFLICT OF INTEREST: None

FUNDING SOURCES: None

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. World Health Organization. Dengue: guidelines for diagnosis, treatment, prevention and control. World Health Organization: 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, SYa G, Horzinek MC, Igarashi A, Kääriäinen L, et al. Flaviviridae. Intervirology. 1985;24(4):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; 74:3227-34.
7. Bäck AT, Lundkvist A. Dengue viruses - an overview. Infect Ecol Epidemiol. 2013;3.
8. Ooi EE, Gubler DJ. 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(1):1-9.
10. World Health Organization. Dengue hemorrhagic fever: diagnosis, treatment, prevention and control. World Health Organization: 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. Screaton G, Mongkolsapaya J, Yacoub S, Roberts C. New insights into the immunopathology and control of dengue virus infection. Nature Reviews Immunology. 2015 Dec;15(12):745-59.
13. Yong HX, Xia MH, Feng WH, Hua DY, Jia SU, Le LX, Yan TX, Peng MH, Can ZB, Hong ZQ, Min CH. Outbreak of dengue fever in central China, 2013. Biomedical and Environmental Sciences. 2014 Nov 1;27(11):894-7.
14. Tiga-Loza DC, Martínez-Vega RA, Undurraga EA, Tschampl CA, Shepard DS, Ramos-Castañeda J. Persistence of symptoms in dengue patients: a clinical cohort study. Transactions of The Royal Society of Tropical Medicine and Hygiene. 2020 May 7;114(5):355-64.
15. Teixeira LD, Nogueira FP, Nascentes GA. Prospective study of patients with persistent symptoms of dengue in Brazil. Revista do Instituto de Medicina Tropical de São Paulo. 2017;59.
16. Rehman MM, Zakaria M, Mustafvi SA. Clinical and laboratory profile of dengue fever patients admitted in combined military hospital rawalpindi in year 2015. Pakistan Armed Forces Medical Journal. 2017 Aug 30;67(4):496-501.
17. dos Santos Oliveira RA, Cordeiro MT, de Moura PM, Baptista Filho PN, de Mendonça Braga-Neto U, Júnior ET, Gil LH. Serum cytokine/chemokine profiles in patients with dengue fever (DF) and dengue hemorrhagic fever (FHD) by using protein array. Journal of Clinical Virology. 2017 Apr 1;89:39-45.
18. 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.
19. 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;67(4):548-51.
20. Kim 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.
21. 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

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