

Outbreak investigation report of dengue fever during June-November 2014: A case study of district Swat, Pakistan

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Abstract

Objective: To determine the frequency distribution of dengue fever during the 2014 outbreak in a district in northern Pakistan.

Methods: This cross-sectional study was conducted between June and November, 2014, at Saidu Sharif Teaching Hospital, Swat, Pakistan, where patients were screened for dengue virus non-structural protein using Dengue Duo strips from Standard Diagnostics (SD). Data was obtained from patient's record, filled forms and through questionnaire.

Results: Of the total 812 patients, 290(35.71%) tested positive for dengue virus non-structural protein, of whom 175(60.34%) were males and 115(39.66%) were females. Overall, 146(50.34%), cases were recorded in the 16-30 age group, while 7(2.41%) were reported in those aged >60 years. The highest numbers of cases were recorded from Faizabad 84(28.96%), whereas the lowest numbers of cases 42(14.48%) were reported from Sethi Amankot.

Conclusion: Dengue virus affected male individuals more compared to female. The affected areas had poor drainage and water storage system.

Keywords: Dengue fever, Frequency distribution, SD Dengue Duo strips. (JPMA 68: 192; 2018)

Introduction

Dengue fever is a viral disease caused by positive sense single stranded ribonucleic acid (RNA) virus belonging to family Flaviviridae, genus Flavivirus. The disease is transmitted by aedes mosquito known as aedes aegypti and aedes albopictus.^{1,2} In Pakistan the first case of dengue fever was reported from Karachi in 1994.³ From 1994 to 2014 there were many outbreaks of dengue fever in Pakistan.³⁻¹⁰ The first outbreak occurred in Swat district during August 2013, that infected more than 7,000 people, among them 29 deaths were reported including 3 of medical doctors.³ Dengue cases were also reported from the adjacent district of Swat, District Dir(Lower), and Malakand Agency.¹¹ A lesson need to be learned from these outbreaks for the prevention of the disease. Proper diagnosis, early treatment, case-identification, awareness, and on-time response from government and health agencies are required to control and eliminate the disease from the study area. This study was planned to determine the frequency distribution of dengue fever during the

2014 outbreak in district Swat.

Patients and Methods

This cross-sectional study was conducted between June and November, 2014, at Saidu Sharif Teaching Hospital (SSTH), Swat, Pakistan. The total area of the district is 5,337square km with a population in 2014 of approximately 2,161,000.¹²

Clinically suspected diagnosed dengue patients were registered at SSTH, and screened for dengue virus (DENV) non-structural protein (NS1) glycoprotein using SD Dengue Duo Strips as per the instruction of manufacturing company. Data was obtained from patient's record, filled forms and through questionnaire. The socio-demographic information was collected that included gender, age, area and date of admission. Only dengue-positive cases were further analysed for gender, age, platelet count, area and month-wise distribution. Patients enrolled at other health facilities, government and non-government hospitals of district Swat were excluded from the study which was approved by the ethical research committee of the Department of Genetics, Hazara University, Mansehra.

The data was entered into Microsoft Excel 2007 and analysed. Simple descriptive statistics were used in the form of frequency and percentage.

Results

Of the 812 subjects investigated, 290(35.71%) were

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Table: Characteristics of dengue positive patients in district Swat from June-November 2014.

Character/parameter		Frequency	Percentage
NSI result	NSI reactive	290	35.71
	NSI non-reactive	522	64.29
Gender	Male	175	60.34
	Female	115	39.66
Age (years)	1-15	47	16.20
	16-30	146	50.34
	31-45	63	21.72
	46-60	27	9.31
	Above 60	7	2.41
Platelet counts	< 100000 cells/mm ³	155	53.44
	< 50000 cells/mm ³	103	35.51
	< 20000 cells/mm ³	32	11.03

NSI: Non-structural protein.

positive, while 522(64.29%) tested negative for dengue infection. Among the positive cases, 175(60.34%) were males and 115(39.66%) females. Age-wise analysis indicated that the highest number of positive cases 146(50.34%) were reported in the 16-30 age bracket followed by 63(21.72%) of 31-45 years, 47(16.20%) in 1-5 group, 27(9.31%) in 46-60 bracket, and 7(2.41%) cases were >60 years. Majority of the positive dengue patients 155(53.44%) had platelets (PLT) < 100000 cells/mm³, while 103 (35.51%) had PLT < 50000 cells/mm³ and 32 (11.03%) had PLT < 20000 cells/mm³ (Table).

Area-wise distribution showed that the highest number of dengue-positive cases were reported from Faizabad 84(28.96%), followed by, Skha Chena Amankot 56(19.31%), Saidu Sharif 44(15.17%) and Sethi Amankot 42(14.48%). Of the total dengue cases, 64(22.06%) were from areas out of the district (Figure-1).

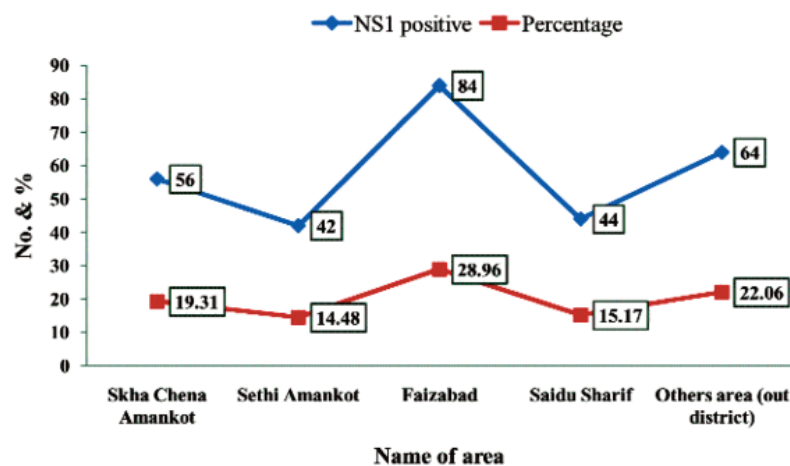


Figure-1: Area-wise distribution of dengue positive cases.

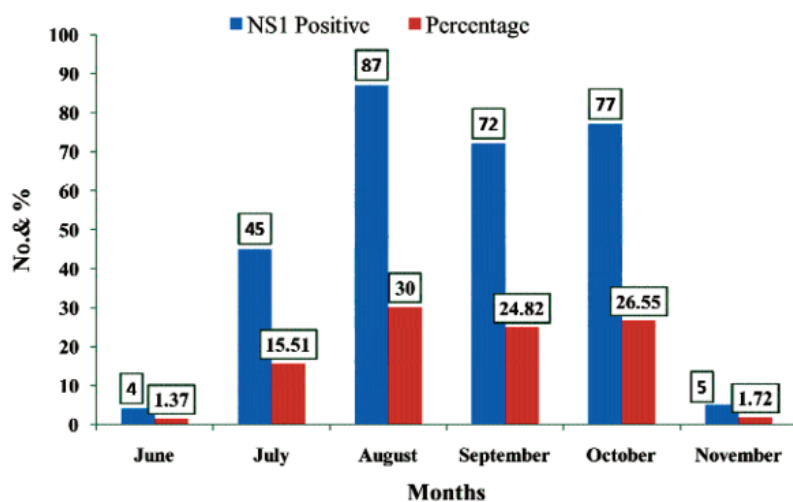


Figure-2: Month-wise distribution of dengue positive cases.

The highest number of cases were reported in the month of August 87(30%), followed by October 77(26.55%), September 72(24.82%), July 45(15.51%), November 5(1.72%) and June 4(1.37) (Figure-2).

Discussion

This was the second outbreak of dengue fever in Swat district, and the prevalence rate was reported at 35.71%, which was lower than the first outbreak of dengue, reported at 69.58%.¹³ The highest numbers of positive cases were reported in age between 16-30 years. It might be because members of this group are mostly active in the open environment that makes them vulnerable to mosquito bite. The results of this study are comparable with the findings of Muhammad et al.¹⁴ A study conducted in Khwazakhela, district Swat, reported maximum number of positive cases 55.22% in age between 20-39 years while the lowest number of cases 3% were reported in age group above >59 years. Another study conducted by Ahmad et al.¹³ reported the highest number of cases 52.54% in age between 14-30 years while the lowest number of cases 3.8% in age group >60 years.

In the current study positive cases were recorded high in male community of district Swat as compared to the female community. Muhammad et al.¹⁴ had reported the highest number of cases — 81% in males and 19% in females. Ahmad et al.¹³ also reported high number of cases in males as compared to

female population of swat district — 69.58% and 30.42%, respectively. A study conducted in Nepal shows that male community members are more infected as compared to females.¹⁵ Males travel more frequently as they have no travelling restrictions, which may be the reason for high number of cases reported in males. A study conducted by Ahmad¹¹ in District Head Quarter Hospital Batkhela shows that out of total positive cases 3 male patients frequently travelled to district Swat. It indicates that the disease may transfer from one place to another place. The area-wise analysis shows that the majority of the positive cases were recorded from Faizabad, as the area has poor sanitation and drainage system, and such conditions are conducive to the breeding of dengue vectors.

There is no proper treatment and vaccine available for the dengue treatment, and the supportive treatment was given to all patients. Prevention is the best tool to control the disease. Awareness, diagnosis of new cases, destroying the mosquito breeding sites, covering the water reservoirs, removal of stagnant water, covering the hands and legs especially for males, and lectures and seminar for awareness regarding the disease are required to control and eliminate the disease from the affected areas. Awareness, proper drainage and storage system, early diagnosis and supportive treatment are essential for controlling the dengue infection.

Conclusion

Young male individuals living in areas with poor sanitation were at the highest risk of catching a dengue infection.

Disclaimer: None.

Conflict of Interest: None.

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