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## Dengue virus epidemics: A recent report of 2017 from district Mardan, Khyber Pakhtunkhwa province, Pakistan

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**Abstract**

Dengue is a key vector-borne viral disease throughout the entire regions of the world. It is a human disease. Dengue transmits from one person to another person by biting of two types of mosquito female *Aedes aegypti* and *Aedes albopictus*. This study intended to find out the current problem of dengue virus infection during the recent prevalence in 2017 in Mardan. The patients of dengue virus infection belong to the different parts of district Mardan which were admitted in Mardan Medical Complex (MMC). The patients of dengue were cured in an isolated ward. Number of total patients infected by dengue were 1978 in 9 months' duration (February 2017 to October 2017). The suspected patients were screened for the infection through a technique called immune chromatographic technique (ICT). The ICT were coated by recombinant NS1 antigen and both the antibodies IgG and IgM. Total of 302 patients were found positive for dengue IgG, IgM or both IgG and IgM, NS1, NS1+IgG, NS1+IgM, NS1+IgG+Ig. The infection ratio of dengue in males (208) were higher than female (94). Infection rate was found greater in the age range from 15 to 35 years of age (47.01). The patients were suffering from severe fever (98.3%), Abdominal pain (57%), Nose bleeding (51%), Skin rash (17%), Vomiting (53%), Gum bleeding (29%), Hematemesis (34%) headache and Fatigue. The infection of dengue virus is lesser in Mardan as compare to other regions of KPK, Pakistan in 2017. The outcomes of our findings show that the ratio of prevalence is higher in male as compare to that of female in the recent outbreaks.

**Keywords:** Epidemics, IgM, IgG, ICT

**Introduction**

Now a days Dengue is an emerging viral disease and it causes intense problems for public health including a high number of populations from all regions of the world such as tropical, sub-tropical and temperate regions<sup>[1, 2]</sup>. It is stated that about 50% of the world population are living in dengue susceptible areas where they can be easily infected by the disease and the remaining 50% of the world population live in dengue indigenous regions<sup>[2, 3]</sup>. Dengue virus (DENV) have the ability to cause more Human infection than other arbovirus diseases and the ratio of mortality and morbidity is higher dengue infection. Recent studies show that about 390 million people are infected every year 96 million people are clinically diagnosed every year<sup>[4]</sup> while about 2.5 billion people living tropical and subtropical regions of the world are at a high risk of dengue virus transmission. Every year approximately 100 million cases of dengue classical fever and about 450,000 cases of dengue hemorrhagic fever are noted<sup>[5]</sup> Dengue virus (DENV) belongs to the group of viruses named flaviviruses which have four different serotypes (DENV-1, DENV-2, DENV-3 and DENV-4) which is transmitted by the help of mosquito *Aedes aegypti* (primary vector) and *Aedes albopictus* (secondary vector). *Aedes aegypti* is a mosquito which feeds on human blood. It is a highly urbanized mosquito, it breeds in water stored to use for different purposes and rain water<sup>[6]</sup> The World Health Organization (WHO) in 2013 reported on neglected tropical diseases and called for an increased demand to focus on the prevention of dengue. The potential of dengue to infect in every environment and the overall increase of the dengue was noted. Especially dengue has shown a 30-fold increase in the ratio of infection over past 50 years which indicates no sign of reduction.

The report calls for evaluation and integration of the past ratio of infection to achieve a 50% decrease in the death ratio and 25% decrease in the morbidity of the dengue infection by 2020

[7]. the first infection of dengue in Pakistan was reported in 1994-95 in Karachi. After that a lot of outbreaks were reported in Karachi and Lahore [8]. After that an increased ratio of dengue infection were reported in 2006 in Pakistan which was due to the result of co-circulation of serotypes DENV-2 and DENV-3 respectively. Nowadays a small in change in the clinical spectrum, pattern and outcomes of dengue has been documented, with an increased incidence of DHF in clinical practice [9].

The present study has focused on district Mardan (KPK), to whom least attention has been given during the outbreaks. The aim of the study was to find out documented cases of dengue infection in the current outbreak in the year 2017 in district Mardan that has done major breakthrough in Peshawar

city of KPK.

**Materials and methods**

**Study Site**

All the patients belong to district Mardan which is about 60 km away from Peshawar the capital of KPK. The total population of Mardan is 2.373 million according to the 2017 survey. In the last five years the prevalence of dengue virus is reported through DHF cases. The study is an agricultural zone, where the climate is tropical. The average temperature ranges from 20 to 30 Celsius and the relative humidity is quite high while maximum humidity was recorded in December which is 73%. The average rainfall in Mardan is 559mm.



Map of District Mardan

**Data collection**

The study was done was done in Mardan Medical Complex (MMC) with the approval of Medical superintendent (MS) and in cooperation of medical physicians and laboratory technical staff. The patients admitted with dengue infection symptoms and dengue hemorrhagic having positive, IgM, IgG and NS1 anti-dengue antibodies were directly observed and interviewed.

**Analysis**

The suspected people have been selected for dengue infection over done with Immunochromatographic technique (ICT), having recombinant NS1 antigen and mutually antibodies IgM and IgG coated. Totally these cases were registered and record was observed from the time when February 2017 to October 2017. The patients were examined for Gum bleeding, Petechiae, Sever Headache, enlarged liver (splenomegaly), Epistaxis, Abdominal pain, Hematemesis, Loose motion, and vomiting. The analysis was done for anti-dengue antibodies NS1, IgM, IgG with the help of different problem-solving tools.

**Approval from ethical committee**

The study was approved by the Ethical Committee of the Department of Genetics, Hazara University, Manshera.

**Results**

The number of total patients were 1978, out of which 302 (15.26%) patients were screened positive from February 2017

to October 2017. The number of male positive patients were 208(10.51%) and the number of that of total positive female patients were 94(4.78%).

**Table 1:** Patient Detail

Total Patient	Total Positive patient	Male	Female
1978	302 (15.26%)	208 (10.51%)	94 (4.78%)

The infected patients were observed to suffer from various symptoms like fever, followed by common clinical features of enlarged liver, nose bleeding and then vomiting. Less common symptoms include abdominal pain, gum bleeding, and blood in vomiting, melena and skin rashes.

**Table 2:** Clinical features of dengue infected individuals.

S. No	Symptom	Percentage
1	Fever	98.3%
2	Enlarged liver	61%
3	Abdominal pain	57%
4	Vomiting	53%
5	Nose bleeding	51%
6	Gum bleeding	29%
7	Haematemesis (vomiting blood)	34%
8	Skin rashes	17%

In Table 3 all the serological test/markers of all the positive patients (302) were shown including NS1, IgG and IgM. Additionally, the age wise dengue prevalence was also determined by analyzing the data obtained from hospital.

**Table 3:** Anti-dengue antibodies in male and female

Anti-dengue Antibodies	Male	Female	Total	Percentage%
NSI	14	7	21	6.95%
IgG	49	23	72	23.81%
IgM	112	51	163	53.97%
NSI + IgG	2	1	3	0.99%
NSI+ IgM	3	5	8	2.65%
IgG + IgM	20	9	29	9.60%
NSI + IgG +IgM	4	2	6	1.98%
Total	208	94	302	

The ratio of infection is much higher in patients with the range of 15 to 35 (47.01%), followed by the patients with age

of 1 month to 15 years (24.92%) and from 35 to 50 years of age (18.54%) And from 50 Onward Age (10.92%) (Table 4)

**Table 4:** Age wise data of dengue infected patients.

Age of patients	No. of patients	Percentage%
1 month-15 years	71	24.92%
15-35	142	47.01%
35-50	56	18.54%
50- Onward	33	10.92%

## Discussion

It is believed that dengue virus comes to Pakistan with tires at Karachi sea port having eggs of infected mosquitoes. Now a day's dengue virus has infected several people in Pakistan <sup>[10]</sup> Up to 1994 there is no infection caused by dengue virus in Pakistan. In 1982 dengue was identified in Punjab, Pakistan <sup>[11]</sup> in our study it is observed that majority of the people infected by dengue virus suffer from bleeding from different body parts like nose, gum etc, their data present in hospitals shows that they were suffers from leucopenia and thrombocytopenia too. Our study states that to suppress the effects of low blood level a patient must take fluids like juice and that type of medicines which reduces the risk of leucopenia and thrombocytopenia <sup>[12]</sup> For the first time in Khyber Pakhtunkhwa a detailed study was conducted in which a total of 612 dengue infection cases were reported in their study. The overall ratio of prevalence of dengue specific antibody (IgM or IgG) was 52.12% and about 23 (3.75%) patients showed both IgM and IgG antibodies. Those patients who had travel to areas where rate of infection of dengue were present have higher ratio of positivity as compared to those who didn't travel such areas. In urban areas a higher ratio of infection was shown as compare to the rural areas and the incidence of IgM and IgG were higher too in the rural areas. Symptoms including fever, Skin rash, joint pain, headache and Fatigue were significantly linked to dengue fever. IgM and IgG antibodies were more commonly seen in the post-monsoon season (68.33%) than in the monsoon period (31.68%). Similarly, in our study majority of the patients were belong to urban areas as compared to rural areas. The male was more positive as than female. During an Interview from one of the patients, it became quite clear that traveling plays an important role in the geographic expansion of dengue in the world. This study indicates that during dengue epidemics, the preventive measures should be strictly followed for national and international travels so that the disease may not spread from dengue endemic part to non-endemic part of a region. In the current study, the ratio of infection of dengue was much high in male population as compared to females. The length of fever was observed between 4-7 days, most of the patients presented the remittent duration of fever. In this study, the count of low platelets was also taken into account.

This study suggests that during DF & DHF the platelets count gradually decreases and patients with low platelets count are in more severe conditions. Dengue is noticed as an urban disease and the fatal disease partially accredited to gradually more populated towns in rural areas as well <sup>[12]</sup> Dengue cases were identified during the period of August– October in 2013. The data obtained from hospital showed that most of the patients were belonging to urban areas as compared to rural areas, which is in agreement with the results of Khan *et al* <sup>[13]</sup>. The present study witnessed that the post-monsoon season (August-September) is an ultimate period for dengue infection which might be due to high humidity after heavy rain fall, which helps the breeding of mosquitoes, our result is matching with a national report <sup>[14]</sup>. Due to World's supreme growth in population and unplanned and abandoned urbanization, people of different societies migrate from one plane to another place, may cause the spread and transmission of vectors and corresponding infection <sup>[15, 16]</sup>.

In this study it is somehow clear that most of the patients were of young age it might be due to more exposure to the environment or more susceptible than of other ages. However, the rate of dengue infection was observed to be higher with the passage of time. It is may be the reason that people travel from rural areas to urban areas where the dengue is endemic. Most of the patients were suffered from fever which shows that it is the most common symptom of the dengue infection [Table. 2]. The patients were observed to suffer from bleeding from various body parts including nose, gums etc., however the biochemical analysis of these patients shown that the presence of other abnormalities like thrombocytopenia and leucopenia etc. The patients also presented different symptoms including fever (98.3%), abdominal pain (57%), Skin rash (17%), Nose bleeding (Epistaxis51%), Gum bleeding (29%), Vomiting (53%), Haematemesis (34%) headache and Fatigue [Table. 2]. It is observed that these symptoms were significantly involved in dengue fever. In conclusion least number of populations in district Mardan has been infected by the dengue virus as compared to other cities of KPK and Pakistan even in the same or earlier epidemics.

## Conclusion

From current study it may be concluded that Dengue virus infection is endemic in district Mardan of Khyber Pakhtunkhwa (KPK) province, Pakistan, which is under high risk of morbidity and mortality. The most affected age group found was 15 to 35 years. Male to female ratio of the Dengue fever was about 2:1 among the total infected population. Fever was observed as the most common symptom among all the dengue infection cases reported. In case of inattention concerning precautionary measure against the dengue outbreak it may attain worryingly spiraling in future. Therefore, public health department of Khyber Pakhtunkhwa Pakistan should take a proper consideration to avoid and control dengue epidemics in future.

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## References

1. Guzman MG, Kouri G. Dengue: an update. *Lancet Infect Dis.* 2002; 2(1):33-42.
2. Gubler DJ. Dengue, Urbanization and Globalization: The Unholy Trinity of the 21(st) Century. *Trop Med Health.* 2011; 39(4):3-11.
3. WHO. Global Strategy for Dengue Prevention and Control, 2012-2020. Geneva: WHO Press, 2012.
4. Bhatt S, Gething PW, Brady OJ, Messina JP, Farlow AW, Moyes CL *et al.* The global distribution and burden of dengue. *Nature.* 2013; 496(7446):504-507. doi: 10.1038/nature12060 PMID:23563266.
5. Murray NE, Quam MB, Wilder Smith A. Epidemiology of dengue: past, present and future prospects. *Clin Epidemiol.* 2013; 5:299-309.
6. Khan J, Khan A. Incidence of dengue in 2013: Dengue outbreak in District Swat, Khyber Pakhtunkhwa, Pakistan. *IJFBS.* 2015; 2(1):50-56.
7. World Health Organization. Sustaining the drive to overcome the global impact of Neglected tropical diseases: Second WHO report on neglected diseases. Geneva: World Health Organization, 2013. <http://www.who.int/iris/handle/10665/77950>.
8. Humayoun MA, Waseem T, Jawa AA, Hashmi MS, Akram J. Multiple dengue serotypes and high frequency of dengue hemorrhagic fever at two tertiary care hospitals in Lahore during the 2008 dengue virus outbreak in Punjab, Pakistan. *Int J Infect Dis.* 2010; 14(3):e54-59.
9. Khan E, Siddiqui J, Shakoor S, Mehraj V, Jamil B *et al.* Dengue outbreak in Karachi, Pakistan, 2006: experience at a tertiary care center. *Trans R Soc Trop Med Hyg.* 2007; 101(11):1114-1119.
10. Strobel M, Lamaury I. [Dengue fever: A review]. *Rev Med Interne.* 2001; 22(7):638-647.
11. Chan YC, Salahuddin NI, Khan J, Tan HC, Seah CL *et al.* Dengue haemorrhagic fever outbreak in Karachi, Pakistan, 1994. *Trans R Soc Trop Med Hyg.* 1995; 89(6):619-620.
12. Ali A, Rehman HU, Nisar M, Rafique S, Ali S *et al.* Seroepidemiology of dengue fever in Khyber Pakhtunkhwa, Pakistan. *Int J Infect Dis.* 2013; 17(7):e518-523.
13. Khan J, Khan A. Incidence of dengue in 2013: Dengue outbreak in District Swat, Khyber Pakhtunkhwa, Pakistan. *IJFBS.* 2015; 2(1):50-56.
14. Khan E, Kisat M, Khan N, Nasir A, Ayub S *et al.* Demographic and clinical features of dengue fever in Pakistan from, 2003-2007.
15. Gubler DJ, Trent DW. Emergence of epidemic dengue/dengue hemorrhagic fever as a public health problem in the Americas. *Infect Agents Dis.* 1993; 2:383-393.
16. Gubler DJ. Arboviruses as imported disease agents: The need for increased awareness. *Arch virol Suppl.* 1996; 11:21-32.