

Prevalence of Dengue in Students of Arid Agriculture University Rawalpindi

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Abstract

The incidence of Dengue fever has increased in tropical and subtropical areas including Pakistan. In Pakistan dengue is most prevalent. Dengue fever has emerged as a worldwide problem over the last five years. It has troubled many people across Pakistan including Lahore especially after the floods in 2010. The clinical signs of dengue start from a mild illness to life threatening shock syndrome. There is an urgent need of development of proper treatment for dengue and to create awareness among people. The current study was aimed to find the prevalence of dengue fever in university students. The prevalence of dengue in the university was calculated 17% as we approached 81 people among them 14 were infected with dengue hemorrhagic fever. The disease was more prevalent among females than male population. The disease was more prevalent among younger people. There were 42(65%) people suffering from headache, 19(29%) joint pain, 26(40%) muscle pain and 16(25%) were suffering from abdominal pain out of 64 people among age group 18-23 years. The obtained data was helpful in defining the therapeutic approaches against this emerging infection. Furthermore the relationship of demographic factors like age, gender and socio-economic status with transmission of dengue virus was also being under consideration.

Keywords: Dengue fever, *Aedes aegypti*, clinical signs, demographic factors, Rawalpindi.

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INTRODUCTION

Dengue fever is a severe febrile viral disease that has emerged as a worldwide problem over the last five years (Hassan *et al.*, 2013). In 1906, it was recognized that dengue *Aedes* mosquitoes mostly *Aedes aegypti* transmit dengue virus (Guzman and Isturiz, 2010). Dengue virus has four serotypes which are known as DEN-1, DEN-2, DEN-3, and DEN-4 (Halstead, 1988).

The first case of dengue fever was documented in Pakistan in the southern port city of Karachi in 1994 (WHO, 2010). The peak incidence of dengue virus in Pakistan is the post monsoon period throughout the year. The situation became worse with floods in Pakistan (Jahan, 2011). A total of 21,597 cases of dengue fever were documented in 2011 in Punjab including 365 deaths due to this outbreak (Choudry, 2011). Unfortunately there is no control because there are no specific vaccines available (Syed *et al.*, 2010).

Dengue virus is responsible for two types of infections; these are the primary infection and secondary infection. Primary infection causes dengue fever (DF, acute febrile illness) occur in about seven days after a complex immune response. Secondary infection is very dangerous than primary infection and due to secondary infection hemorrhagic fever (DHF) or dengue shock syndrome (DSS) occurs (Guzman and Kouril, 2002). Both infections (DHF and DSS) can be lethal and patients of DHF and DSS may be died at severity (WHO, 1997). When a mosquito carrying the dengue virus bites a person it injects its virus in to the skin of the host and binds with the certain cells like keratinocytes and langerhans dendritic cells of the host (Urquiza-Inchima *et al.*, 2010). Then human host is infected by the biting of this *A. mosquito*. The *A. aegypti* is a small domesticated black and white insect that bite humans mostly during the day time. There are two periods of feeding activity, early morning for 2-3 hrs and for several hrs in the afternoon. Female *A. aegypti* feeds on several persons during a single

meal and transmit its dengue virus from one person to other in a very short time (Raja *et al.*, 2009; Rodenhuis- Zybert *et al.*, 2010).

The clinical signs of the dengue fever alter with the age of the patients. The symptoms of classic dengue (“break bone fever”) include severe headache, sudden onset of high-grade fever, pain behind the eyes, nausea, rash, vomiting and decrease in total white blood cell count. Albeit thrombocytopenia and severe bleeding are characteristics of severe dengue, but these may also appear in milder cases of dengue fever. The US Food and Drug administration has authorized a new diagnostic test, the CDC DENV- 1-4 Real time TR PCR Assay established by Centers for Disease Control and Prevention to reveal the dengue virus in infected patients (Rattue, 2012).

There are three ways to resolve the dengue infection. The first is to use preventive measures. We can prevent ourselves by avoiding contact with infected mosquitoes. The mosquito *A. aegypti* bites during day time and its contact can be avoided through many ways. Proper waste management and refining storage of water, eradicating all sources of standing water, using pesticides, insect repellents and mosquito coils and nets, wearing long sleeved dresses (Jahan, 2011). The second is vaccination and the third is drug therapy but no antiviral drugs are accessible yet (Selisko *et al.*, 2006). The purpose of this study was to find the prevalence of dengue and associated risk factors in students of Arid Agriculture University.

MATERIALS AND METHODS

The study was conducted in PMAS Arid Agriculture University. In this university people are residing from different parts across the country. Their socio economic status was different so both genders were taken in the study of prevalence of dengue in university students. The subjects included agriculture department students, students living in hostel and zoology department students. The questionnaire was designed in such a way that all the related information was collected. A total of 81 individuals among them male and females were approached to check out the prevalence of dengue fever during October 2015 to January 2016 in university students. Demographic data of all the patients was collected that include gender, age, history of disease, occupation, educational levels, daily work activity (sedentary or non-sedentary), and health behaviors etc.

Statistical Analysis

The appropriate statistical test was applied to compare the obtained data with the healthy subjects using SPSS Version 16.

RESULTS

PREVALENCE OF DENGUE

The prevalence of dengue fever based on gender, age and overall prevalence has been calculated in this study. The results showed that out of 81 people, 14(17%) were

suffering from dengue fever and 67(83%) were found normal (Figure 1).

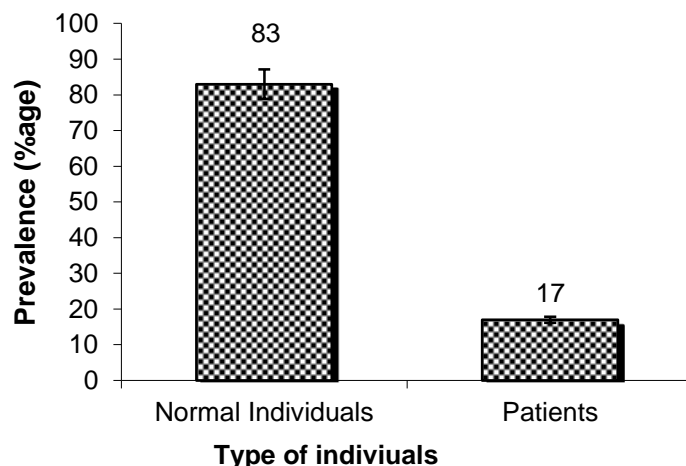


Fig. 1. Total prevalence of Dengue Fever in university students

As we further analyzed the data to check the gender based prevalence it was observed that out of 67 males 28(35%) were normal while 5(19%) were suffering from this infection while out of 14 females 39 (48%) were normal while 9(11%) were patients (Figure 2).

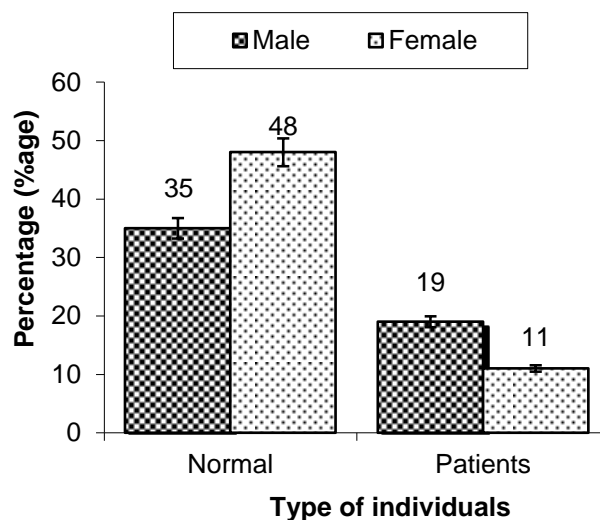


Fig. 2. Gender based prevalence of Dengue

While age wise analysis showed that out of 81 respondents there were 64(79%) people suffering from dengue fever among age group 18-23, 15(19%) people among age group 24-29, 1(100%) people among the age group 30-36 years and no patient of dengue fever was found among the age group of 37-41 years (Figure 3).

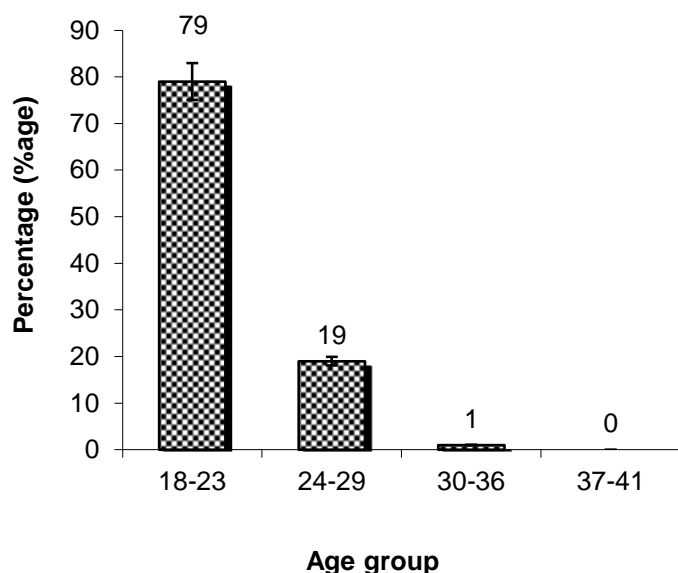


Fig. 3. Age based prevalence of Dengue

Various factors showed association with dengue fever among people of different age groups. Among age group 18-23 years out of 64 people, there were 42(65%) people suffering from headache, 19(29%) joint pain, 26(40%) muscle pain and 16(25%) were suffering from abdominal pain. Among age group 24-29 years out of 15 people, there were 6(40%) people suffering from headache, 6(40%) joint pain, 5(33%) muscle pain and 5(33%) were suffering from abdominal pain. Among age group 30-36 years the only 1 respondent was suffering from headache, joint pain, muscle pain and abdominal pain. Among age group 37-41 years there was no person suffering from any of the factors (Table 1).

Table 1. Factors associated with dengue fever in different age groups

Age	Signs and symptom effects			
	Headache	Joint pain	Muscle pain	Abdominal pain
18-23	42(65%)	19(29%)	26(40%)	16(25%)
24-29	6(40%)	6(40%)	5(33%)	5(33%)
30-36	1(100)	1(100)	1(100)	1(100)
37-41	0(0%)	0(0%)	0(0%)	0(0%)

DISCUSSION

According to the proposed study the prevalence of dengue in the university was calculated 17% as we approached 81 people among them 14 were infected with dengue hemorrhagic fever. In a previous study Ali et al. (2015) reported 18.3% prevalence of dengue in Data Ganj Baksh town, whereas 13.3% and 12.6% in Gulberg and Cant Town respectively. As the data was evaluated at

gender base there was a slight difference in the prevalence of dengue due to different routine activities of male and female individuals of defined population. Females had less frequency of disease as compared to male because the male individual of the population had more outdoor activities which let the vector to access them more as compared to women who were staying indoor during the high activity of the vector of dengue virus. Similarly Ali et al. (2015) has reported high prevalence of dengue in males. Tahir et al. (2010) also documented more prevalence of Dengue fever in males (58.55%) than in females (41.44%) in Lahore. Mehmood et al. (2009) reported an overall male to female ratio of 1.25:1 in Pakistan. There are also reports about incidence of liver disorders tuberculosis in Pakistani population (Toor et al., 2016; Ahsan et al., 2016). As the data was analyzed on different age levels it was observed that people with the age of 18-23 and 24-29 were infected more as compared to the people of age group above 29 that might be due to couple of reasons like younger people spend their time more in outdoor activities and playing in playgrounds where there is abundance of the dengue virus vector and vector easily access them and transmit the pathogen to them while the people of older ages like above 30 were not involved much in outdoor activities. In previous study the prevalence of dengue fever was found highest (23.14%) among the age group 21 to 30 years among all age groups (Ali et al., 2015). Dilshad et al. (2016) documented higher rate of Hepatitis B infection in males among the age group 46 to 60 years in malarial patients. Among the factors associated with dengue fever most common were headache, joint pain, muscle pain and abdominal pain. Similarly a previous study reported 43% prevalence of dengue fever among the age group of 20-30 years, including 75% male patients. The most frequent clinical signs and symptoms were fever, vomiting and abdominal pain (Qureshi et al., 1997). The risk factors like diabetes, family history, smoking, tension and obesity also contribute to the development of other diseases like hernia, angina pectoris and hypertension in human population in Pakistan (Iqbal et al., 2015; Iqbal et al., 2016; Iqbal et al., 2016). Carelessness can also become a factor because in the younger ages people do not care about their activities while older age people have well awareness and they care about the health warnings.

CONCLUSION

On-going campaign regarding public awareness of dengue should be supported and more dynamic campaigns should be commenced. Family doctors in primary health care have favorable circumstances not only provide the best probable sympathetic care to their patients but also teach them about the spread of Dengue fever and vector control.

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CONFLICT OF INTEREST

There is no conflict of interest.

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