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PREVALENCE OF DENGUE VIRAL INFECTION IN PESHAWAR, KPK, PAKISTAN

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Abstract:

Background: *Dengue is a widespread mosquito-borne viral infection in human beings, which is a major public health concern all over the world. In recent years, dengue is predominant in the tropics and subtropics with a high incidence and increased considerably over the last three decades.*

Objective: *To investigate the prevalence of dengue in Peshawar, Khyber Pakhunkhwa, Province of Pakistan. A total of 823 samples were collected from 823 patients by puncturing the vein in aseptic condition. Serum of patient was analyzed by Immunochromatography technique (ICT).*

Results: *Out of patients, 671 were male and 152 were female. Among the total of 823 samples, 196 (23.81%) patients were positive for Dengue Non-Structure 1 (NS1) while 627 (76.18%) were negative. In male patients 147 (21.90%) were positive for Dengue NS1 while 524 (78.09%) were negative. Out of 152 (18.46%) female patients 49 (32.23%) were positive for Dengue NS1 and remaining 103 (67.76%) were negative.*

Conclusion: *It is concluded that the prevalence of dengue infection is higher in male than in female due to susceptibility of male to certain risk of dengue.*

Key Words: *Prevalence, Dengue viral infection, Peshawar*

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NTRODUCTION:

Dengue is a life-threatening illness allover the world. Dengue virus (DV) infection in humans is often in apparent but can lead to a wide range of clinical expressions, from minor fever to possibly lethal dengue shock syndrome (DSS) (1). Dengue is a mosquito-borne viral infection predominant in the tropics and subtropics with an incidence and range that have increased considerably over the last three decades (2).

The dengue virus (DV) belongs to genus Flavivirus (family Flaviviridae) with a species of Aedes *aegypti* and Aedes *albopictus* usually breeds in dark places, stagnant water kept in containers for (indoor and outdoor) storage, water coolers, drums, barrels, plant saucers, open buckets, in used tires and places where rainwater collects (3). Dengue fever (DF) is caused by any of four closely linked, but antigenically separate and genetically different virus serotypes such as DENV-1, DENV -2, DENV-3 and DENV-4 (4).

Repellents are a common means of personal protection against mosquitoes and other biting insects. *Larvivorus* fish have been extensively used for the control of Aedes *aegypti* in large water bodies or large water containers (5).

Dengue viral infection in Pakistan was prior associated with tires having eggs of infected mosquitoes at Karachi sea port. Up to now dengue viral infection has caused several outbreaks in Pakistan (6). It was detected in 1995 that 3/10 dengue infected patients with dengue-1 and dengue-2 was revealed from Baluchistan (7). Dngue-3 viral infection outbreak was reported from Karachi in 2005 among the examined patients (8). Epidemic of dengue-3 in Pakistan (2006) was related to outbreak in New Delhi (2004) (8). In 2007, Karachi, Hyderabad, Mirpurkhas, Lahore, Haripur, Rawalpindi and Islamabad were affected resulting in 24 deaths out of 2700 reported cases (9). Punjab Health Department release a report in September 2011 and revealed that more than 12,000 individuals were infected and 250 were dead with dengue virus in last January to September (2011). In February 2012, total of 73 dengue cases were confirmed from Lahore and other areas of the Punjab Province of Pakistan (3). The year 2007 and 2011 has been worst years in regarding dengue viral infection in Pakistan (8). Largest but, of the short duration outbreak of Dengue occurred in Khyber Pakhunkhwa Province in 2013 affecting more than 20000 humans with approximately 4000 deaths (10). In 2014, 290 positive cases for dengue virus non-structural protein (NS1) were reported in Swat, of whom 175 were male and 115 were female (11). An outbreak of dengue fever was reported in Malakand district, Khyber Pakhtunkhwa (KP) province of Pakistan during 2015 due to prevalent of serotype of DENV-3 (11, 12). Officials with the Pakistan Ministry of National Health Services, Regulations and Coordination say the number of dengue fever cases in the country was nearly 10,000 in 2015. Specifically, 9,899 cases were registered, including seven fatalities during the course of the year which was high 5-fold from 2014 numbers (13).
This study is carried out to evaluate the prevalence of dengue in Peshawar, Khyber Pakhtunkhwa province of Pakistan.

METHODS AND MATERIALS:

This descriptive cross sectional study was designed in the department of Medical Laboratory Technology, The University of Haripur, Haripur and conducted at Hayatabad Medical Complex, Peshawar, Khyber Pakhtunkhwa (KPK) province of Pakistan. This study took six months from March to August 2018 to accomplish.

Patients with episodic fever with at least 2 consecutive days, positive NS-1 ICT antibodies against dengue and presenting the typical clinical characteristic of dengue fever according to the world health organization (WHO) criteria were included whereas NS-1 negative dengue patients, haematological abnormalities, septicemia, transfusion reaction, allergic and have other concomitant infections such as malaria and typhoid were excluded from current study.

About 3 millimeter of venous blood was collected from patient aseptically in gel tube (yellow top). Allowed to clot and serum was separated by centrifuge at 3000 revolution per minute for 5 minutes at room temperature.

Blood samples were stored at -20 ℃ till they were analyzed. The collected specimens were labeled with subjects name, sex, lab number, date, age and with other useful information.

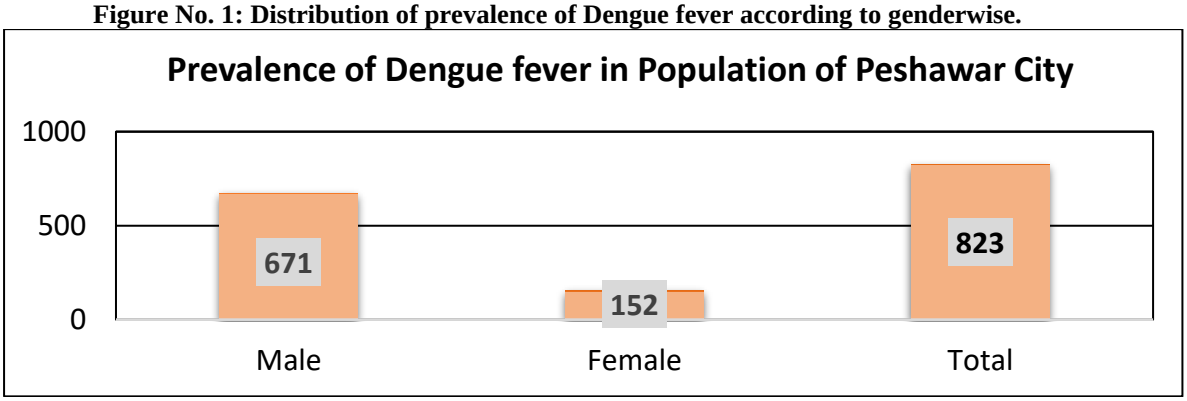
Before investigation all sample reagents were thawed at room temperature. About 100ul of serum was dropped on the serum collecting area on the kit and 100ul buffering reagent was dropped. After 15 minutes the immunocomplex reach non-mobile antibody results in generation of red purple color.
Word Power Sheet Excel Spreadsheet 2016 was used for data entry, processing, management

and analysis. All the analyzed data were presented as mean± standard deviation. Less than 0.05 P-value were considered as significant.

RESULTS:

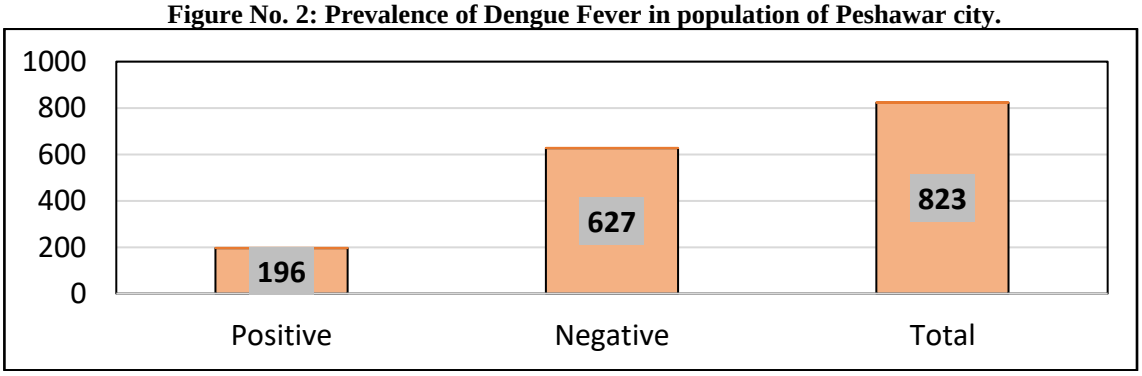
A total of 823 patients were screen in order to detect dengue virus in their serum. Out of 823 subjects, 671 (81.53%) subjects were male and 152 (18.46%) were female subjects as shown in figure No.1.

Figure No. 1: Distribution of prevalence of Dengue fever according to genderwise.



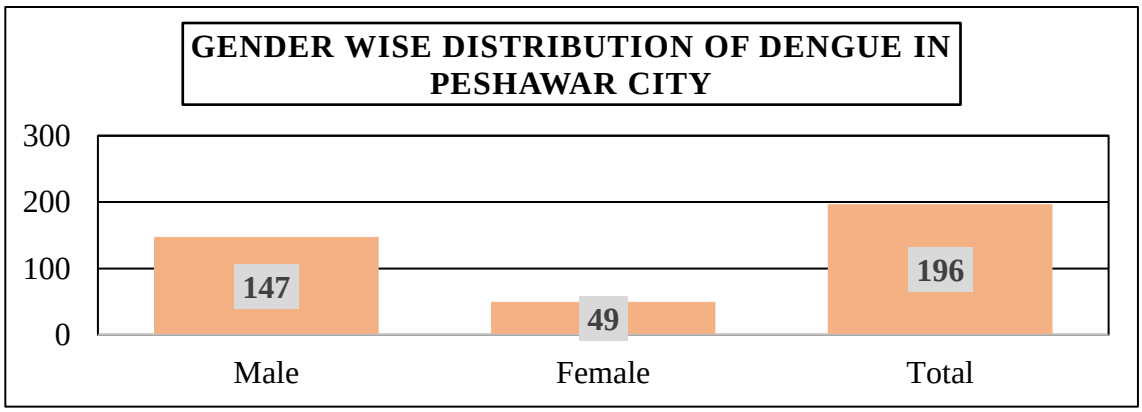
Out of total 823 subjects 196 (23.81%) were dengue positive and 627 (76.18%) were dengue negative as shown in figure No. 2.

Figure No. 2: Prevalence of Dengue Fever in population of Peshawar city.



Out of 152 (18.46%) female patients 49 (32.23%) were positive for Dengue IgG, IgM or Dengue NS1 and remaining 103 (67.76%) were negative.

Figure No. 3: Gender wise distribution of Dengue in Peshawar city.



DISCUSSION:

Current study revealed that 75% males and 25% females were positive for IgG, IgM and NS1. These calculations shows that the prevalence of dengue fever is more in males than in females. It may be due to the fact that the male are more exposed to mosquitoes, as they remain outside more than female and prone to mosquitoes being working in open environment like fields, in industries, tires factories etc.Jahangir et al (2015) and Zahid et al (2016) studies revealed similar reports that the prevalence of DF is higher in male than in female (10, 14). Most of the studies shows greater prevalence of the Dengue infection in male (15) while the death rate of patients due to dengue infection is higher in female than in male (16). It may be due to the fact that the male can seek health facilities more as compared to female in developing countries.

The limitation of this study was that no haematological and serological values are concerned. Similarly, sensitivity and specificity of ICT is less than other techniques like Polymerase Chain Reaction (PCR) and ELISA (Enzyme Linked Immunosorbent Assay). The following study suggests about the adaptation of all the self-preventive measures in such conditionsto avoid further spreading of the virus; otherwise, thissituation could lead toconsiderable dengue complicationsin future.

CONCLUSION:

The prevalence of the infection is higher in male than in female (3:1). There is need to initiate Public-awareness campaign and also educate themregarding the spread of dengue fever and vector control.Moreover, there is need to strengthen the vector and epidemiological surveillance and operational research on dengue vector(s) densities, bionomics between high and low epidemic-prone areas, rural and urban areas and characteristics of virus. These measures, eventually, will lead to implement community-friendly and sustainable disease management strategies in the country.

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