



Commentary

Prevalence of Dengue Serotype (DENV-2) in Pakistan

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ABSTRACT

Dengue is one of the leading cause of death worldwide. The first outbreak of dengue hemorrhagic fever was reported in 1994 in Pakistan and after that several outbreaks of the dengue were reported in Pakistan and in all these outbreaks, the dengue serotype 2 (DENV2) was confirmed, which ensures that dengue serotype 2 (DENV2) is prevalent in Pakistan.

Keywords: Dengue virus, Outbreaks, DENV2

Dengue fever has become the major cause of mortality and morbidity in tropical and subtropical areas in several past decades worldwide (1). Dengue virus belongs to the genus *Flavivirus*, family *Flaviviridae*, having four distant serotypes (DENV-1 to DENV-4). According to an estimate, the risk of dengue virus transmission is in 2.5 billion people of tropical and subtropical areas distributed in 100 countries (2). Dengue fever is an arthropod-borne disease transmitted by *Aedes aegypti* and *albopictus* by blood-feeding or by transoviral transmission (3). South Asia is declared as endemic area for dengue and dengue hemorrhagic fever by World Health Organization (WHO). About 50 million dengue infections are estimated every year by WHO currently. In America 890000 cases of dengue were reported, of which 26000 were dengue hemorrhagic fever (DHF) only in 2007 (4).

In Pakistan the dengue virus is now endemic; in the post monsoon periods, the virus circulates

throughout the year with a peak incidence. The situation is made worse by the recent floods in Pakistan (4). The first outbreak of DHF was reported in 1994 in Pakistan (5). Using DENV2 antigen 15 patients were identified with IgM out of 16 patients. Further it was also observed that out of ten patients of dengue virus three patients were infected with DEN-1 and DEN-2 (6). Dengue virus is believed to come in Pakistan with tyres at Karachi sea port carrying eggs of infected mosquitoes. To date, dengue virus infection has caused several outbreaks in Pakistan (7).

In 1995, DEN-2 infection was reported from Baluchistan (8, 9). Using ELISA study, DEN-1 and DEN-2 were found in patients in 1998 (10).

Among few infected patients in the outbreak of dengue hemorrhagic fever (DHF) in Karachi, in 2005 DEN-3 was reported. DEN-1 and DEN-2 were found in serum of children in Karachi, using serological studies (10, 11). Until the large outbreak

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occurred in Karachi in 2006 the frequency of DHF was less documented in Pakistan; DEN2 and DEN3 serotypes were reported during the outbreak in Karachi (12).

In 2006, the outbreak in Karachi, the DEN-2 and DEN-3 were found to be co-circulated (12, 13) while in our results the most prominent dengue serotypes DEN-2 and DEN-3 were observed. Large numbers of citizens of Lahore were infected from dengue outbreak reported in 2008 in Lahore. From samples DEN-4, DEN-2 and DEN-3 infection were found (9). High levels of anti-dengue IgM antibody were reported in children living in Karachi in 2009 (14). Samples had concurrent infection with serotypes DEN-2 and DEN-3 detected from samples. It is evident from studies that serotype DEN-2 was dominant in samples of dengue virus infection collected during in the period of three years (2007– 2009) in Pakistan (15). They reported about the presence of DEN-1 and DEN-2 in the samples (16). The circulating serotypes in the 2011 outbreak of Lahore DENV-2 and DENV-3 were the most common serotypes while DENV-4 was the small causing agent of the incidence (17). The circulating serotypes in the 2013 dengue outbreak in Khyber Pakhtunkhwa were DENV 2 and DENV 3 (18). The prevalence of dengue serotype is also shown in table 1.

Table 1. Prevalence of dengue virus serotypes in Pakistan

Year	DENV Serotypes	References
1994	DENV-2	(6)
1995	DENV-2	(8, 9)
1998	DENV-1, DENV-2	(10)
2005	DENV-1, DENV-2, DENV-3	(10, 11)
2006	DENV-2, DENV-3	(12, 13)
2008	DENV-2, DENV-3, DENV-4	(9)
2009	DENV-2, DENV-3	(15)
2010	DENV-1, DENV-2	(16)
2011	DENV-2, DENV-3, DENV-4	(17)
2013	DENV-2, DENV-3	(18)

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