EDITORIAL

Molecular Genetics of Dengue Fever Diagnosis

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SUMMARY

Dengue fever was a major health outbreak occurs in 2011 in Lahore, Pakistan. This epidemic attack claims more than 300 lives and affected more than 15000 persons directly. On its initially stage, it was considered a seasonal fever as there was not any indication but as this epidemic expanded, it was diagnosed as dengue viral infection and fever was named as dengue fever. One of the basic reason in the high rate of dengue victims was lack of dengue fever diagnosis at molecular basis. Diagnosis based on molecular genetics of any breakout is always considered as gold standard in prevention of any epidemic.

Keywords: Dengue viral infection, Molecular genetics, dengue outbreak in Pakistan, Viral borne diseases in Pakistan

Dengue fever is an increasingly frequent epidemics disease in Pakistan. In 2010, it infected more than 20,000 people whereas in 2011, more than 15,000 peoples were diagnosed with dengue fever and according to the official estimate, more than 300 patients lost their lives only in 2011. Government of Pakistan, especially state Government of Punjab, did a lot efforts to control this epidemics with the help of some international supports from Sri Lanka, Indonesia etc (1, 2).

Dengue virus is transmitted to the human blood by the mosquito's bites via skin capillaries. To control this viral infection, early diagnosis of dengue is the most appropriate step. Availability of rapid molecular diagnostic approaches, e.g. detecting viral RNAs, antibodies, antigens etc might help to control the viral infection at early stages. A simple PCR technique (polymerase chain reaction) and ELISA (enzyme-linked immunosorbent assay) can be used to detect dengue viral RNAs and infectious proteins in the population and after finding such infectious molecules, proper measure can be taken to handle the dengue viral infection at early stage (3).

Studying the dengue viral genome, we can see that it is composed of 11,000 nucleotide bases coding three different types of protein molecules (C, prM and E) which are required to form the virus particles and associated proteins required for replication i.e. (NS1, NS2a, NS2b, NS3, NS4a, NS4b, NS5) (4). Dengue virus has five types of strains which are called serotypes and are known as DENV-1, DENV-2, DENV-3, DENV-4 and DENV-5 (5, 6). Almost all strains have a 21-nucleotide deletion in the hyper-variable region of the 3'-non-translated region in common (7).

Dengue viral infection can be managed and controlled well if we can detect it at early stage. The loss of huge lives in the Punjab state of Pakistan because of

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dengue virus was the result of unawareness to this type of fever. Hospitals equipped with molecular diagnostic laboratory and molecular diagnosis for the known serotypes in fever patients will result to control this epidemic in future.

The main objective of this editorial is to discuss the significance of molecular diagnosis of dengue viral infection at early stages. This special issue is also aimed to discuss all aspects of dengue viral infection including cellular and molecular basis for better knowing of what dengue virus is?

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