Incidence of primary dengue viral infection in healthy adults of Rawalpindi, Pakistan

Madam, dengue viral infection (DVI) is a global health problem, infecting about 50-100 million people annually.[1] More than 2.5 million cases have Dengue Haemorrhagic Fever (DHF) and Dengue Shock Syndrome (DSS).[2] Female Aedes aegypti mosquito is the principle vector.[3] A primary dengue infection results from the first exposure with only one of the four DEN serotypes. It is seen in those who are not immune to the Flaviviruses. The cross reacting antibodies formation in the secondary phase leads to DHF and DSS.[3,4] In the absence of specific therapeutic measures, the mortality rate with DHF and DSS is 5%.[5]

Until 2006, Pakistan did not encounter a significant Dengue problem. The situation now has dramatically changed. Dengue virus has spread almost all over Pakistan due to increased number of infected people among the population.[6] A study report by Jamil B indicated the high prevalence of DEN 3 serotype in Pakistan at Aga Khan University Hospital by analyzing the samples of 39 admitted patients who were confirmed for the presence of IgM anti-dengue by ELISA and PCR.[7]

Keeping in view the existing problem of this emerging arboviral disease, the current study was designed to analyze the prevalence of Primary Dengue infection (IgG) amongst the healthy adult population of Rawalpindi, Pakistan.

It was a descriptive cross sectional study carried out at Department of Microbiology, Rawalpindi Medical College (RMC), Rawalpindi, Pakistan from March to September 2009. The sample size was two hundred and forty, (144 from urban residents and 96 from rural residents of Rawalpindi district). The approval of the study was taken from the ethical review committee of RMC.

The presence of anti-Dengue IgG antibodies were detected by using 3rd Generation ELISA kits (Omega, UK and Vircel, Scotland), having a sensitivity and specificity of 99.3%. One of the disadvantages of ELISA method is that, there is chance of cross reactivity with other flaviviruses.[8] Thus, due to this reason one of the exclusion criteria of study were those candidates who had a history of immunization with other flaviviruses i.e Yellow fever ($\geq$ 9 year), Japanese encephalitis ($\geq$ 1 year) and Tick borne fever ($\geq$ 2 year).

Out of 244 samples, 69(28.8%) were found to be positive for anti-Dengue IgG antibodies. Out of total 144 samples, 50(20.8%) urban residents and 19(8%) rural residents were found to be positive for IgG anti- Dengue antibodies. These results were significant ($p < 0.05$).

There is an urgent need of time to carry out such sero epidemiological studies on large scale to find out the real extent of the problem. It is of further concern that in the absence of specific anti- viral agents and specific vaccine, which could be possibly available earliest by the end 2013,[9] the early diagnosis and prompt management of the condition can be helpful to reduce the morbidity and mortality rates. In case of negligence, this situation can lead to massive and serious outcomes in the form of DHF and DSS in the years to come.

Humaira Zafar,[1] Abbas Hayyat,[2] Naeem Akhtar[3]

Postgraduate Trainee for MPhil Microbiology,[1] Department of Pathology,[2] Department of Microbiology and Immunology,[3] Rawalpindi Medical College, Rawalpindi, Pakistan.

References

1. Shepard DS, Coudeville L, Halasa YA, Zambrano B, Dayan GH. Economic Impact of dengue illness in the Americas. Am J Trop Med Hyg 2011; 84: 200-7.
2. WHO, Dengue and dengue haemorrhagic fever. Fact sheet No.117. (Online) (Cited 2009 March). Available from URL: http://www.who.int/mediacentre/factsheets/fs117/en/.
3. Heyman D, Chakarborty T. Deadly diseases and epidemics: dengue fever and other hemorrhagic viruses. WHO 2008. (InfoBase Publishing).
4. Shu PY, Hang JH. Current advances in dengue diagnosis. Clin Diagnos Lab Immunol 2004; 11: 642-50.
5. Pandey BD, Morita K, Khanal SR, Takasaki T, Miyazaki I, Ogawa T, et al. Dengue virus Nepal. Emerg Infect Dis 2008; 14: 514-5.
6. Pakistan: Dengue threats lurk over Karachi. IRIN.. Humanitarian news and analysis. (Online) (Cited 2009 July 14). Available from URL: http://www.irinnews.org/report.aspx? Reported =70718.
7. Jamil B, Hasan R, Zafar A, Bewley K, Chamberlain J, Mioulet V, etal. Dengue virus serotype 3, Karachi, Pakistan. Emerg Infect Dis 2007; 13: 182-3.
8. Wichman O, Stark K, Yun Shu P, Niedrig M, Frank C, Huang JH, et al. Clinical features and pitfalls in the laboratory diagnosis of dengue in travelers . BMJ Infect Dis 2006; 6: 120.
9. Sanofi Aventis builds DF vaccine plant. (Online) (Cited 2009 May 12). Available from URL: http//www.pr.inside.com/sanofi-aventis-builds-dengue-fever-vaccine r1246621.htm.