

## Possible Ocular Associations Of Dengu

Dr Sharmistha Behera, Dr P.K.Nanda, Dr Sulin Kumar Behera

VSS Medical college, Burla

### INTRODUCTION :

Dengue is a mosquito-borne infection found in tropical and subtropical regions in more than 100 countries worldwide.<sup>1</sup> Dengue virus belongs to the genus *Flavivirus* (family: *Flaviviridae*). *Aedes aegypti* is the major vector for human transmission in urban areas and *Aedes albopictus* is the major vector in the suburban and the rural areas.<sup>2,3</sup> There are four serologically distinct, but closely related viruses that cause dengue fever. Recovery from one infection provides lifelong immunity against that serotype but confers only transient and partial protection against heterologous infections,<sup>2</sup> and sequential infections may increase the risk of more serious systemic as well as ocular disease.<sup>3</sup>

Approximately 100 million cases of dengue fever (DF) and 450 thousands cases of dengue hemorrhagic fever (DHF) and dengue shock syndrome (DSS) are estimated to occur annually, whereas approximately 2.5 billion people live in areas at risk of dengue virus transmission.<sup>4</sup> A dengue outbreak was witnessed for the first time in September 2003 in Southern India.<sup>5</sup> In 2006, India again witnessed an epidemic of dengue and type-3 serotype was found to be the etiological agent for the epidemic. Now this scaring epidemic in odisha in august-September 2011.

### OCULAR ASSOCIATIONS ;

Dengue fever can impair the vision ranging from mild blurring of vision to catastrophic and severe blindness. In the largest series of ophthalmic complications of acute dengue infection, intraretinal hemorrhages (45%) were the most common feature and were usually seen in association with vasculitis.<sup>10</sup> Ocular manifestations reported to be associated with dengue infection are mostly posterior segment manifestations like macular oedema, vascular occlusions, chorioretinitis, vasculitis with related retinal bleeding, or cotton wool spots.<sup>6,7,8</sup> Anterior segment manifestation has mostly been reported in the form of subconjunctival hemorrhage, which is related to thrombocytopenia.<sup>9</sup>

Anterior uveitis has been rarely described in the acute dengue infection.<sup>8,10</sup> Ocular manifestations are described mostly during the acute stage of the disease.

### PATHOGENESIS ;

Precise mechanisms responsible for various ocular complications in dengue are not known. The ocular features peak in acute dengue infection corresponds to the nadir of level of platelets and, thus, a common immune-mediated pathogenesis has been suggested for these manifestations.<sup>8,10</sup> Low complement C3 and C4 in dengue patients further suggests immune-mediated mechanism.<sup>11</sup> The possibility of specific autoantibodies production against various tissues of eye has been suggested.<sup>7,12</sup> This includes the possibility of production of specific autoantibodies against retina, retinal pigment epithelium, and even choroid.<sup>7,14,16</sup> However, the precise mechanism responsible for the various ocular tissues alteration, leading to sensitization in dengue and there by, causing uveitis, is still unknown.<sup>9</sup>

The release of cytokines with vasoactive and procoagulant properties in response to immunological activation might explain the occurrences of retinal vascular occlusion seen in patients with dengue infection.<sup>6,7</sup> In addition, these inflammatory mediators cause capillary leakage and breakdown of the blood aqueous barrier, resulting in anterior uveitis.<sup>15,16</sup>

To conclude, dengue virus results in a spectrum of ocular manifestations, ranging from nonspecific symptoms to symptomatic retinal hemorrhages and from nonimmunological to immunological manifestations like uveitis. The etiopathogenic relationship of the dengue virus and ocular complications merits further investigation.

### References

1. WHO. Dengue and Dengue Haemorrhagic Fever, Fact Sheet No. 117 WHO: Geneva, 2002.
2. Gibbons RV, Vaughn DW. Dengue: an escalating problem. *Br Med J* 2002; 324: 1563-1566.
3. Nimmannitya S. Clinical manifestations of dengue/

- dengue haemorrhagic fever. In: Thongcharoen P (ed). Monograph on Dengue/Dengue Haemorrhagic Fever. Regional Publication No. 22. World Health Organization, Regional Office for South-East Asia: New Delhi, 1993 pp 48-54.
4. Gubler DJ, Clark GG. Dengue/dengue hemorrhagic fever: the emergence of a global health problem. *Emerg Infect Dis* 1995; 1: 55-57.
  5. Hoti SL, Soundravally R, Rajendran G. Dengue and dengue haemorrhagic fever outbreak in Pondicherry, South India, during 2003-2004: emergence of DENV-3. *Dengue Bull* 2006; 30: 42-50.
  6. Cruz-Villegas V, Berrocal AM, Davis JL. Bilateral choroidal effusions associated with dengue fever. *Retina* 2003; 23: 576-578
  7. Lim WK, Mathur R, Koh A, Yeoh R, Chee SP. Ocular manifestations of dengue fever. *Ophthalmology* 2004; 111: 2057-2064.
  8. Chan DP, Teoh SC, Tan CS, Nah GK, Rajagopalan R, Prabhakaragupta MK et al. Ophthalmic complications of dengue. *Emerg Infect Dis* 2006; 12: 285-289.
  9. Kapoor HK, Bhai S, John M, Xavier J. Ocular manifestations of dengue fever in an East Indian epidemic. *Can J Ophthalmol* 2006; 41: 741-746.
  10. Bacsal KE, Chee SP, Cheng CL, Flores JV. Dengue-associated maculopathy. *Arch Ophthalmol* 2007; 125: 501-510
  11. Su DH, Bacsal K, Chee SP, Flores JV, Lim WK, Cheng BC et al. Dengue maculopathy study group. Prevalence of dengue maculopathy in patients hospitalized for dengue fever. *Ophthalmology* 2007; 114: 1743-1747.
  12. Halstead SB. Immunological parameters of togaviruses disease syndromes. In: Schlesinger RW (ed). *The Togaviruses. Biology, Structure, Replication*, Academic Press, New York, 1980, pp 107-174.
  13. Gamble CN, Aronson SB, Brescia FB. Experimental uveitis. I. The pathogenesis of recurrent immunologic (Auer) uveitis and its relationship to increased uveal vascular permeability. *Arch Ophthalmol* 1970; 84: 321-330.
  14. Wong VG, Anderson RR, McMaster PR. Endogenous immune uveitis. The role of serum sickness. *Arch Ophthalmol* 1971; 85: 93-102.
  15. Kurane I, Ennis FE. Immunity and immunopathology in dengue virus infections. *Semin Immunol* 1992; 4: 121-127.
  16. Kurane I, Innis BL, Nimmannitya S, Nisalak A, Meager A, Janus J et al. Activation of T lymphocytes in dengue virus infections. High levels of soluble interleukin 2 receptor, soluble CD4, soluble CD8, interleukin2 and interferon- in sera of children with dengue. *J Clin Invest* 1991; 88: 1473-1480.

*Take up one idea. Make that one idea your life – think of it, dream of it, live on that idea. Let the brain, muscles, nerves, every part of your body, be full of that idea, and just leave every other idea alone. This is the way to success, that is way great spiritual giants are produced.*

*We are responsible for what we are, and whatever we wish ourselves to be, we have the power to make ourselves. If what we are now has been the result of our own past actions, it certainly follows that whatever we wish to be in future can be produced by our present actions; so we have to know how to act.*

- Vivekananda