

Implication of HHV-6 and HHV-7 infection in the pathogenesis of neurological disorders

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Background. Human herpesviruses (HHV)-6 and -7, which belong to *Herpesviridae* family, *Beta-herpesvirinae* subfamily, *Roseolovirus* genus, are lymphotropic, immunomodulating and neurotropic viruses, which are associated with several neurological diseases.

Aim was to determine implication of HHV-6 and HHV-7 infection in the pathogenesis of fibromyalgia (FM), myalgic encephalomyelitis/chronic fatigue syndrome (ME/CFS) and encephalopathy.

Material and methods. Peripheral blood of 200 ME/CFS patients, 45 fibromyalgia patients, 150 apparently healthy individuals and autopsy tissue of brain from 57 individuals with encephalopathy as well as 51 individuals without neurologic diseases were enrolled in this study. Various PCR methods and immunohistochemistry were used to detect presence of virus genomic sequences, activity phase, viral load and expression of virus-specific antigens.

Results. Concurrent HHV-6 and HHV-7 infection markers were detected significantly often in patients with FM (40%) than apparently healthy individuals (4%) ($p < 0.0001$), and infection in active phase and higher viral load had only patients with FM.

Markers of a persistent HHV-6 infection in active phase had only ME/CFS patients and none of apparently healthy individuals ($p < 0.0001$) with significantly higher HHV-6 load among patients with active than latent infection ($p = 0.0019$). Persistent HHV-7 infection markers of an active phase were detected in 34% of ME/CFS patients and 8% of apparently healthy individuals ($p < 0.0001$) with elevated load in case of severe clinical symptoms ($p = 0.0254$).

In group of individuals with encephalopathy, HHV-6 and HHV-7 infection markers were detected more frequently than in group of individuals without neurologic disorders. HHV-6 specific antigen expression was observed in brain tissue.

Conclusion. Significantly more frequent findings of persistent HHV-6 and HHV-7 infection in an active phase with a higher viral load among patients with FM, ME/CFS and presence of HHV-6 in brain tissue of individuals with encephalopathy, compared with apparently healthy individuals, indicate the importance of these infections in pathogenesis of above-mentioned nervous system disorders.