CYREX® Laboratories

CLINICAL SPECIFICATIONS

HERPES TYPE-1

Function:

Herpes Simplex Virus-1 (HSV-1) is classified as a member of the α-herpes virus group of the *Herpesviridae*, together with HSV-2 and Varicella-zoster virus.

Associated With:

Alzheimer's disease[1]
Amnestic mild cognitiveimpairment[1]
Lower respiratory tract infection[2]

Known Cross-Reactions: HSV 2;[3] Varicella zoster;[4] α-Synuclein;[5] $A\beta_{42}$[6,7]

Clinical Significance:

HSV-1 is typically acquired non-sexually in childhood, often passed from mother to offspring. Initial infection is subclinical and, during reactivation, may result in cold sores. USA seroprevalence was greater than 50% from 1999-2010 according to the National Health and Nutrition Examination Survey (HANES).[8] Using rhesus macaques, researchers studied the distribution of HSV-1 in tissues post-infection; HSV-1 was found in: lungs, trachea, cerebrum, cerebellum, spinal cord, thalamus, lymph nodes, spleen, pancreas, ileum, tongue, lip, eye, larynx.[9] HSV-1 can have devastating effects on the lungs. It has been found in lung secretions where it was the suspected cause of life-threatening pneumonia or tracheobronchitis.[10] Indeed, HSV-1 antibody titres of ≥ 4-fold were found in patients with lower respiratory tract infection.[2] Multiple studies on the possible role of HSV-1 chronic reactivation in Alzheimer's disease (AD) have been conducted. For an excellent review of studies, please see Itzhaki.[11] One such study found HSV-1 in the brain of AD patients.[11] Taking it a step further, others have identified cross-reactivity between HSV-1 and amyloid beta ($A\beta_{42}$) peptide.[6,7] In a mouse model for the study of AD pathogenesis, researchers injected HSV-1 into mice. After 4 hours the mice showed markers of lipid peroxidation. Further observations, after multiple HSV-1 reactivations, included enhanced levels of inflammatory cytokines (interleukin-6 and 1b), accumulation of amyloid beta peptides and altered tau phosphorylation.[12] These mechanisms can lead to AD. Taken together, this information supports the role of HSV-1 in the pathogenesis of AD. The detection of antibodies against $A\beta_{42}$ and HSV-1 therefore becomes very significant; if the blood-brain barrier becomes compromised, these antibodies may penetrate, and their binding to $A\beta_{42}$ peptide and HSV-1 antigens may contribute to the pathogenesis of AD.

References:

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