

Assessing putative interplay between human herpesvirus-6 infection and alcohol abuse in substantia nigra

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The previous studies have demonstrated that the central nervous system (CNS) is particularly vulnerable to alcohol induced changes, for example, alcohol increases the risk of Parkinson's disease by affecting Substantia nigra (SN). Also called the "Black Substance", it is the dopaminergic neurons rich part of the basal ganglia located in the midbrain.

Human herpesvirus-6 (HHV-6) is a linear double stranded DNA virus; infection is ubiquitous and can induce various neurological diseases. HHV-6 replicates most efficiently in activated primary T cells, however, studies show that the virus can also replicate in a wide array of host cells, for example in monocytes, macrophages, astrocytes, oligodendrocytes and neurons. The aim of the study is to detect the presence of HHV-6 in SN region of chronic alcoholics and healthy individuals.

Post mortem tissue samples of SN grey and white matter from 42 individuals (control group, age matched alcoholics and non-age matched alcoholics) were analysed in this study. DNA was extracted using black PREP FFPE DNA kit. To detect viral genomic sequences and variant, we were using nPCR technique. Viral loads were detected using HHV-6 Real-TM Quant kit. Fluorescent immunohistochemical staining and confocal microscopy were applied.

The presence of HHV-6 DNA was detected in 19, 05% (8/42) of the SN region. All positive HHV-6 FFPE tissue samples were from alcoholic individuals. In white matter HHV-6 was detected in 62, 5% (5/8), and in grey matter – 87,5% (7/8) out of HHV-6 positive cases. All control individuals were HHV-6 negative. HHV-6B variant was detected in all positive individuals. Viral load was detected in the one alcoholic individuals' white matter – 101207, 97 copies/1x10⁶ cells. HHV-6 immunopositivity was detected in both grey and white matter. These findings provide evidence that HHV-6 can integrate and replicate in the SN region. In addition, the evidence from this study shows then the potential role of HHV-6 and alcohol use may affect brain homeostasis.

Biography

Samanta Strojeva is studying for a master's degree at the University of Latvia, Faculty of Biology. Last year, she successfully defended her bachelor's thesis about "Involvement of HHV-6 infection and proinflammatory cytokines in autoimmune thyroiditis development". Next year Samanta Strojeva will defend her master's thesis about SARS-CoV 2. For almost 2 years she is working in Riga Stradiņš University as a senior laboratory assistant. In March 2021, Samanta Strojeva successfully defended her thesis in RSU research week 2021 about "Formation of SARS-CoV-2 specific antibodies in dynamics". At the moment, she is working in fundamental and applied research project of the Latvian Council of Science 2020/2-0069 "The role of human herpesvirus-6 infection and alcohol abuse in the development of neuroinflammation".