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The Multiple Sclerosis condition and the Role of Varicella-zoster virus in its Progression

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Abstract : Multiple sclerosis (MS) is the most common inflammatory autoimmune disease of the CNS that affects the myelination process in the central nervous system (CNS). Complex interactions of various "environmental or infectious" factors may act as triggers in autoimmunity and disease progression. The association between viral infections, especially human Varicella-zoster virus (VZV) and MS is one potential cause that is not well understood. This study aims to summarize the available data on VZV retrovirus infection in MS disease progression. For this study, the keywords "Multiple sclerosis", " Human Varicella-zoster virus ", and "central nervous system" in the databases PubMed, Google Scholar, Sid, and MagIran between 2016 and 2022 were searched and 14 articles were chosen, studied, and analyzed. Analysis of the amino acid sequences of HNRNPA1 with VZV proteins has shown a 62% amino acid sequence similarity between VZV gE and the PrLD/M9 epitope region (TNPO1 binding domain) of mutant HNRNPA1. A heterogeneous nuclear ribonucleoprotein (hnRNP), which is produced by HNRNPA1, is involved in the processing and transfer of mRNA and pre-mRNA. Mutant HNRNPA1 mimics gE of VZV as an antigen that leads to autoantibody production. Mutant HnRNPA1 translocates to the cytoplasm, after aggregation is presented by MHC class I, followed by CD8 + cells. Of these, antibodies and immune cells against the gE epitopes of VZV remain due to the memory immune response, causing neurodegeneration and the development of MS in genetically predisposed individuals. VZV expression during the course of MS is present in genetically predisposed individuals with HNRNPA1 mutation, suggesting a link between VZV and MS, and that this virus may play a role in the development of MS by inducing an inflammatory state. Therefore, measures to modulate VZV expression may be effective in reducing inflammatory processes in demyelinated areas of MS patients in genetically predisposed individuals.

Keywords : multiple sclerosis, varicella-zoster virus, central nervous system, autoimmunity
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