

ASSERTION OF A DIDACTIC ILLUSTRATION SCHEME OF THE IMMUNOLOGICAL RELATIONSHIP BETWEEN THE INDUCTION OF THE CCL5/CCR5 AXIS BY HIV-1 INFECTION AND NEUROAIDS

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Abstract

The occurrence of neurological illness in an HIV-positive individual is the result of a series of circumstances, such as the host immune response. C-C Chemokine Receptor 5 (CCR5) is the primary receptor for HIV-1 entry in cells when combined with the viral glycoprotein 120 (gp120). It orientates the functions of chemokines from the C-C class, including C-C Motif Chemokine Ligand 5 (CCL5/RANTES), which participates in defense against HIV-1. This research sought to review and build a didactic model about the immunopathological relationship between the CCL5/CCR5 axis and neuroAIDS progression. This is a systematic review, according to PRISMA 2020, using articles and reviews published between January 1990 and June 2023 in PUBMED, LILACS, MEDLINE, and SCIELO databases through the descriptors: "HIV-1"; "CCR5"; "CCL5" and "Neurological Manifestations". The methodological quality assessment was done through JBI Checklists. The scheme construction was performed in Adobe Photoshop CS6 software. The sampling resulted in 36 articles. Through the release of gp120 mediated by CCR5 activation in Central Nervous System-CNS cells, there is an increased secretion of CCL5/RANTES mRNA, which can oligomerize on the cell surface and act as a powerful modulator of neuroinflammation. The release of viral proteins, such as Tat, induced by the CCL5/CCR5 pathway causes reactivity in astrocytes, altering the porosity of the blood-brain barrier (BBB). Oligodendrocytes and neurons are directly affected by Tat, resulting in increased neuronal injury and mortality. Reactive oxygen species (ROS), reactive nitrogen species (RNS), neurotoxins, and proinflammatory mediators are all increased by chronic stimulation of activated microglia and these elements in macrophages cause apoptosis and damage to neuronal cells. Therefore, when high concentrations of CCL5/RANTES are present in the body of HIV-1 infected ones, there is production of more intense inflammatory responses in certain regions of the body, culminating, for example, in the onset of dementia in these patients.

Keywords: HIV; neurologic manifestations; CCR5; CCL5; immunity.