Greater Clarity to How HIV May Lead to Cognitive Decline

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HIV damages the brain, likely leading to neurocognitive disorders, by infecting white blood cells that enter the organ and set off a harmful immune response, Medical Xpress reports. Publishing their findings in Experimental Neurology, researchers conducted cell culture tests as well as tests of nerve cells from rat brains to track how HIV harms brain cells, likely in turn leading to HIV-associated neurocognitive disorders, or HAND.

HIV makes it past the blood-brain barrier by infecting monocyte immune cells and likely CD4 cells as well, which carry the virus into the brain. The researchers tested how HIV-infected monocytes affect what are known as microglial cells, which are immune cells found in the brain and which in theory are activated by HIV-infected monocytes. The activation causes them to release harmful elements, including oxygen metabolites and cytokines, a type of protein. Simulating the steps of HIV infection, the scientists measured the amount of cytokines that were produced at each step in this process. They found that the viral RNA released from the monocytes triggered the maximum amount of microglial cell activation.

Next, the researchers examined nerve cells taken from rat brains in order to see if the harmful effects of the microglial cells would kill brain cells. Indeed, the microglial cells activated by HIV-infected macrophages doubled the number of cell deaths when compared with a control group.

To read the study abstract, click here.

To read a press release on the study, click here.