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Common virus may help doctors treat deadly brain tumors

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A common human virus may prove useful in attacking the deadliest form of brain tumors, according to a study by researchers at Duke's Preston Robert Tisch Brain Tumor Center. The researchers said the finding is an important step in developing a vaccine that can attack the tumors by enlisting the help of the body's immune system.

Human cytomegalovirus (HCMV), which infects 50 percent to 90 percent of people at some point during their lives, is active in more than 90 percent of patients diagnosed with glioblastoma multiforme, the most deadly type of malignant brain tumor, said Duane Mitchell, M.D., Ph.D., a brain cancer researcher and lead investigator on the study.

"We don't know if the virus plays a part in the growth of the brain tumors or whether the presence of the brain tumors leads to a reactivation of the virus," Mitchell said. "But we do know that the virus has the potential to affect the growth and invasiveness of cancer cells. So if we can target it, we may be able to empower the body's immune system to fight infected tumor cells and destroy the cancer."

According to the researchers, a vaccine targeting HCMV likely would be administered to patients following conventional chemotherapy. The immune system's recovery from chemotherapy is marked by a regenerative burst of new immune cells, and the vaccine would take advantage of this reaction to effect an even stronger immune response to the virus, Mitchell said.

The researchers will publish their findings in the February 2008 print issue of the journal *Neuro-Oncology*. The study was published early online on October 19, 2007. The research was funded by the National Institutes of Health, The Brain Tumor Society and Accelerate Brain Cancer Cure, a not-for-profit organization that supports research to hasten a cure for brain cancer.

In healthy people with fully functional immune systems, the initial HCMV infection can be symptom-free or it can be associated with mild flulike symptoms. After infection, the virus becomes dormant and stays that way for the life of the infected person. But in people with weakened immune systems -- such as AIDS patients or those undergoing bone marrow transplant -- HCMV can become reactivated and cause more severe illnesses, such as pneumonia.

HCMV's association with brain tumors was first demonstrated in 2002 by researchers at the University of Alabama - Birmingham, but their results had not been repeated despite several attempts.

"We not only confirmed the virus' association with the tumors but also saw that patients with glioblastoma multiforme had detectable virus in their bloodstreams, where the comparative group did not," Mitchell said. "This association may help us assess the success of vaccine treatment, since we will be better able to monitor response in patients, even after their tumors have been removed."

Based on the results of this study, Duke researchers have developed a vaccine that targets HCMV and are conducting a clinical trial to assess the vaccine's safety and its effectiveness at building immunity to HCMV in patients with brain tumors. In the trial, which will complete enrollment this year, the vaccine is given monthly to cancer patients in conjunction with chemotherapy for as long as their tumors remain stable.

“We’re encouraged by the early results we’re seeing in the clinical trial and we’re pleased that the initial study enabled us to proceed with testing this vaccine in patients,” Mitchell said. “Because HCMV is present in such a large number of glioblastoma multiforme patients, the development of an effective treatment that targets the virus could have significant implications for this deadly disease.”

Source: Duke University