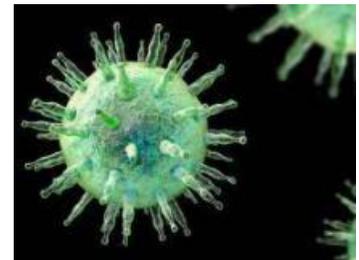


March 2022 Newsletter



Does Epstein Barr Virus Cause MS?

MS is thought to be caused by a combination of factors, including an individual's genetic background, gender, environment, and lifestyle. [Epstein-Barr virus](#) (EBV) has long been suspected to be one of these causal factors. Researchers at Harvard and their collaborators recently published a [study](#) that provides the strongest evidence yet that EBV is, indeed, one of the triggers of MS.



EBV (also known as human herpesvirus 4) is one of the most common human viruses. Most people are infected by it at some point in their lifetime. It is spread primarily through contact with infected saliva. EBV infections in children usually do not cause symptoms, or the symptoms are the same as other mild, brief childhood illnesses. In adolescence and adulthood, it can cause [infectious mononucleosis](#) (also called mono). Symptoms of mono include fatigue, fever, inflamed throat, swollen lymph nodes in the neck, enlarged spleen, swollen liver and a rash. After a person is infected with EBV, the virus becomes latent (inactive) and stays in their body throughout their lifetime. In some cases, the virus may reactivate. This does not always cause symptoms, however people with weakened immune systems are more likely to develop symptoms if EBV reactivates.

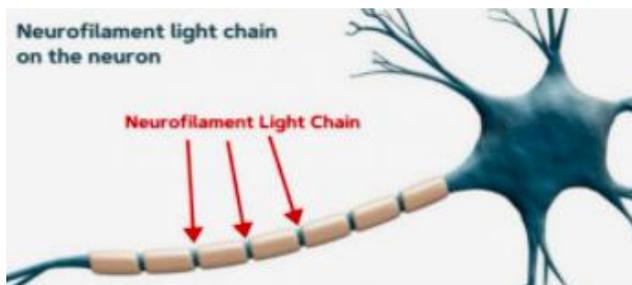


The Harvard study team used blood samples collected to test for HIV ([human immunodeficiency virus](#)) among more than 10 million active-duty United States military personnel between 1993 and 2013. Samples from 801 people who developed MS and 1,566 controls without MS were analyzed. Investigators determined each participant's EBV status at the time the first sample was taken by looking for specific antibodies that signal past infection, and then analyzed additional samples from the same people to determine the relation between EBV infection and MS onset during their period of active duty.

This pivotal research study demonstrates that EBV infection precedes both the symptoms of MS and nervous system damage, and that becoming infected significantly increases the risk for developing MS in susceptible individuals. Of the 801 people with MS and 1,566 without, 35 and 107, respectively were negative for EBV infection in the first blood samples taken. By analyzing additional samples from these same individuals over time, the research team was able to determine that the risk of developing MS increased 32 times in those who became positive for EBV infection. All EBV infections occurred before MS onset.



In order to rule out other possible causes, the Harvard study team also tested for an immune response to [cytomegalovirus](#) (which, like EBV, is also transmitted through contact with infected saliva), but this virus was not linked to an increase in MS risk. Using a novel tool called [VirScan](#), which screens for evidence of an immune response to approximately 200 viruses, they also found no links between other viruses and MS risk.



To test whether EBV infection predated MS-related nervous system damage, the research team looked at levels of a molecule called [neurofilament light chain](#) (NfL), which is a substance released into the spinal fluid and blood when nerves are damaged. [Studies](#) have linked it to MS relapses and disease progression. For the participants who were EBV negative at the time of their first blood sample and who later went on to be diagnosed with MS, the study

results showed that there was no indication of elevated NfL prior to EBV infection. After EBV infection, however, elevated levels were detected prior to MS diagnosis.

There is currently no way to avoid infection with EBV. The virus is easily transmitted and most people have been exposed. There is no specific treatment for EBV and there is no medication that will remove the virus from a person's system once they are infected. However, some things can be done to help relieve EBV symptoms, including drinking fluids to stay hydrated, getting plenty of rest and taking over-the-counter medications for pain and fever. Individuals can help protect themselves from EBV infection by not kissing or sharing drinks, food, or personal items (like toothbrushes) with people who have an active EBV infection.

According to the [National MS Society](#), “We don't know yet if the Epstein-Barr virus causes relapses or influences the MS disease course. However, having an anti-viral medicine that combats the virus may help answer that important question. At least [one study](#) is testing an experimental anti-EBV medication in people with MS, and there are several experimental EBV vaccines in development, including this [recent one](#) announced by Moderna testing its safety in healthy volunteers... It is possible in the future an EBV vaccine could prevent MS. We know that this virus does not act alone, but rather in combination with other risk factors such as a person's genes and environment. In addition to the possibility of an EBV vaccine, researchers are working on ways to calibrate any individual's personal risk for developing MS to provide a possible rationale for intervening before it takes hold.”



The ACP Repository was an important resource that helped lay the groundwork for the Harvard study (samples and data were used in one of the author's [early studies](#) on EBV). Accelerating research efforts such as these is the heart of ACP's mission. We are grateful for all who have participated in the ACP Repository and iConquerMS. Your contributions make advances in



research like this possible! We would also like to express our heartfelt thanks for the many ways that our partners, donors and volunteers have given of their time, talents and resources.

Together we are accelerating research for all affected by MS, bringing us closer to a cure. Thank you for your partnership, support and collaboration!