4 Things to Know About the Role of the Epstein-Barr Virus in Triggering MS

We sat down with Bruce Bebo, executive vice president of research at the National Multiple Sclerosis Society, on an episode of **Ask an MS Expert** to discuss **a recent study published in Science** that provides the strongest evidence to date that the Epstein-Barr virus (EBV) is a trigger for multiple sclerosis.

This blog is adapted from the episode to share 4 things you should know about EBV and MS.

Epstein-Barr Virus Infection is Common

EBV is transmitted primarily through saliva. It infects the immune system, and it persists in a latent form in immune cells called B-cells, and the virus lives there for the rest of your life. By adulthood, about 95% of us show evidence that we've been infected with EBV, and this is a virus that lives inside of us for all of our lives and in most cases doesn't cause any harm.

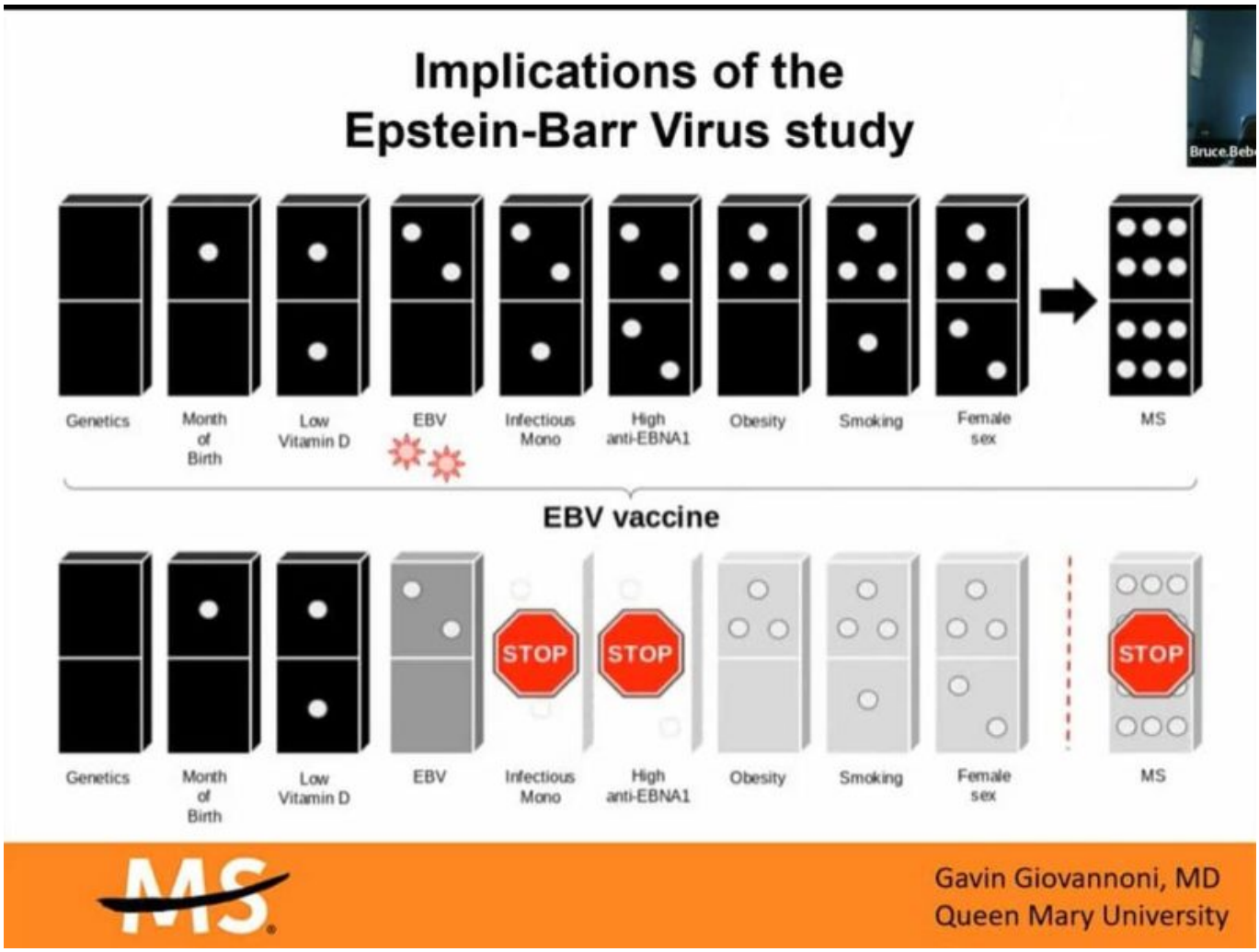
Most people are infected with EBV when they're very young, a time when it usually doesn't cause any symptoms. But if you get infected during adolescence or early adulthood, it can sometimes cause symptoms – it can cause a disease called mononucleosis about 30 to 50% of the time, sometimes called glandular fever.

EBV May Play a Role in Triggering MS, But Does Not Necessarily Cause MS

The article in Science is an extremely well-done study by a highly respected group. What they showed was that the infection with EBV proceeds and comes before any evidence of MS. We're a lot closer to proving causation, and of course the one piece of the puzzle left is to show that preventing EBV can prevent MS.

And there is overwhelming evidence that there's an association between mononucleosis caused by EBV infection and MS. It's important to remember that that doesn't necessarily mean that MS is caused by EBV. And in addition to being a trigger for MS, this virus is also associated with a higher risk for some blood cancers. There's evidence that EBV contributes to the risk of some other autoimmune diseases like lupus, rheumatoid arthritis and Sjogren's syndrome

We don't know the exact cause of MS. Over the last several decades, a number of factors, including mononucleosis, have been associated with an increased risk of MS. There's a role for genetics. for example. We know that if you have a close relative with MS, your risk is higher for developing MS. We know things like low levels of vitamin D childhood obesity and smoking are contributing risk factors for MS.



While the exact cause of MS is unknown, a number of factors, including mononucleosis, have been associated with an increased risk for MS. For example, genetics and low levels of vicamin C, in combination with EBV and infectious mononucleoris, are all contributing factors. Like a string of dominoes, if we can take out one or more of these critical risk factors, we can keep the rest of the dominoes from falling, and we can potentially prevent MS from happening in the first place.

And so, these all and in combination with Epstein-Barr virus and infectious mononucleosis are all contributing factors. Based on the very strong risk that EBV seems to add to this equation, it's likely that this is a necessary and a key factor that contributes to the cause of MS.

Current Efforts Underway to Prevent EBV Infection

Research and testing of experimental vaccines for EBV have been underway for decades. This virus is complex, so progress and the development of vaccines has been slower than we would like, but we're getting closer to safe and effective vaccines for EBV. The Society has been consulting with global experts to explore different concepts and approaches for an MS prevention trial so that once we have a safe and effective vaccine, we'll be ready to test it in an MS prevention trial.

The vast majority of people with EBV do not get MS. What we do know is that if you get EBV as a teenage or young adult and you get mononucleosis, your risk for MS is higher than if you got EBV as an infant or child. But again, only really a very small proportion of even of the people who get mono go on to develop MS. Some have considered thinking of this as a long-term, rare consequence of EBV infection and that remains a possibility. The virus likes to hide and sometimes affects the function of immune B cells, and we know B cells play an important role in MS

We are closer than we ever have been to identifying and understanding the triggers and risk factors for MS. That knowledge is going to lead to prevention and treatment strategies that can be tested and will be tested in the next few years in clinical trials.

Be Aware of Increased Risk Factors and Early Warning Signs of MS

There are early warning signs of MS – problems with vision, or balance and walking, numbness tingling, things like that. And if you have a close relative with MS, maybe you're woman and maybe you had mono as a teenager and/or you're a smoker, these are all risk factors that would indicate that you should be on high alert for those early symptoms and report them to your healthcare provider as soon as possible and see a neurologist as soon as possible. And that way, we could potentially identify people very, very early on in their journey with MS, and we know the earlier we diagnose MS and the earlier we start treating it with an effective disease-modifying therapy, the better the long-term outcomes are going to be.