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In MS patients, HDL cholesterol has a protective effect

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Several studies in recent years have shown that high cholesterol is associated with an increased risk of lesions in the brains of patients with multiple sclerosis (MS). However, the impact of HDL cholesterol—high-density lipoprotein, commonly referred to as "good" cholesterol—on the disease has not been clear.

Now, an international research team led by University at Buffalo researchers has found that HDL cholesterol protects the blood-brain barrier from injury in patients with MS.

"This finding is especially important because we found this protective effect very early in the disease," explained lead author Murali Ramanathan, PhD, professor of pharmaceutical sciences in the UB School of Pharmacy and Pharmaceutical Sciences and professor of neurology in the Jacobs School of Medicine and Biomedical Sciences at the University at Buffalo.

The paper was published in August in the *Journal of Lipid Research*.

The role of HDL was the subject of a controlled, observational study of a group of MS patients who were followed for four years, following their first MS attack.

The findings are relevant not only to new treatments for MS. They also have the potential to be used to establish future lifestyle guidelines for preventing the disease.

"This is the first time that HDL cholesterol has been found to have such a clear benefit against the breakdown of the blood-brain barrier in MS patients," said Ramanathan. That is important, he said, because the blood-brain barrier or "BBB" as it is known, plays a key role in the development of the brain lesions that are characteristic of MS.

"The breakdown of the BBB is the first step in the formation of brain lesions because it allows immune cells to enter the brain, form long-lasting lesions and mediate tissue injury," said Ramanathan. He added that many MS treatments, including interferon-beta, which UB researchers first proved was effective against MS in the 1990s, work by blocking the breakdown of the BBB.

"Cholesterol profiles can be affected by several factors including genetics, diet, smoking and physical activity," explained Ramanathan. "A better understanding of this key class of modifiable factors could be leveraged both as clinical advice to MS patients seeking to reduce the risk of progression and as the basis of guidance to healthy individuals with genetic and other known risk factors for MS."

Results were gathered from 154 MS patients, 67 percent of whom were women, enrolled in a multi-center study of interferon beta–1a, after their first demyelinating event. These events, in which myelin, which protects and insulates nerve fibers, breaks down, produce a range of symptoms, from dizziness and memory loss, to loss of reflexes or blurred vision.

More information: "Protective Associations of HDL with Blood Brain Barrier Injury in Multiple Sclerosis Patients." *J Lipid Res*. 2015 Aug 4. pii: jlr.M060970. www.jlr.org/content/early/2015 … jlr.M060970.full.pdf