Blocking a hormone's action in immune cells may reduce heart disease risk

October 7 2019

Blocking the mineralocorticoid receptor (MR)—a protein that helps maintain normal levels of salt and water in the body—in immune cells may help reduce the risk of heart attack and stroke by improving blood vessel health. The study will be presented today at the American Physiological Society (APS) Aldosterone and ENaC in Health and Disease: The Kidney and Beyond Conference in Estes Park, Colo.

High levels of aldosterone—a hormone involved in regulating the body's fluid balance—are associated with a higher risk of heart attack and stroke. Aldosterone directly binds to and activates MR. MR levels also rise in the blood vessel as part of the aging process, which may contribute to the heightened risk of heart disease in older people.

Atherosclerosis—the narrowing of the arteries that occurs when a fatty substance called plaque builds up in the artery walls—is the cause of heart attack and stroke. "Atherosclerotic plaques form when immune cells infiltrate the blood vessel wall damaged by traditional risk factors like high blood pressure, high sugar levels or smoking," said Joshua Man, of Tufts Medical Center in Boston. The immune cells try to repair the blood vessel damage, but "as more immune cells accumulate, the plaques grow in size. Plaques with more immune cells are more likely to break open, form a clot and result in heart attack or stroke," Man said.

Previous studies have found that drugs that block MR activation (MR antagonists)—which are typically used to treat high blood pressure and heart failure—may reduce plaque size and inflammation in a mouse

model of atherosclerosis. Man's research team explored the role of MR in atherosclerosis-associated blood vessel (vascular) inflammation by studying myeloid cells, a type of white blood (immune) cell that fights infection. The researchers studied male and female mice that lacked MR in their myeloid cells.

Compared with a control group that had normal levels of MR, the mice without myeloid MR had less vascular inflammation and smaller plaques overall. The females' plaques had significantly less inflammation than the male mice.

"This study suggests that a decrease in plaque inflammation from blocking myeloid MR may contribute to the improved outcomes observed in clinical trials with MR antagonists," the researchers wrote. "Therefore, the myeloid MR may be a therapeutic target to stop the persistent inflammation that drives the progression of atherosclerotic disease resulting in heart attacks and strokes," Man added.

More information: www.the-aps.org/professional-d … he-kidney-and-beyond

Provided by American Physiological Society