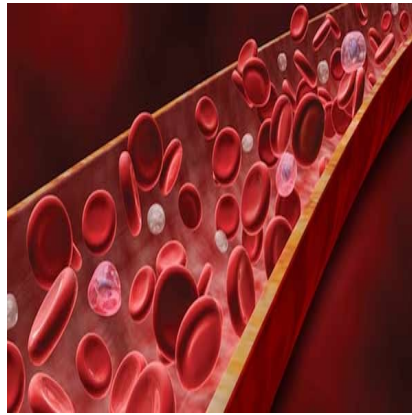




Immune System's Role In Stress-Induced Heart Attacks



New insight into the relationship between stress and heart attacks implicates the immune system, which triggers arterial inflammation during the fight-or-flight response. A new study by researchers at Boston's Massachusetts General Hospital and Harvard Medical School has offered an answer to why prolonged stress can have fatal cardiovascular consequences.

Stress and The Immune System

It is not news that stressful situations initiate the fight-or-flight mechanism, during which the body experiences surging adrenaline to pump the heart as fast as is necessary to increase blood flow in an effort to survive. Whether fighting an attacker or outrunning a perceived predatory threat, the body benefits from the temporary surge of energy.

However, the body as a whole is not the only entity impacted by the stress-induced response. Stress causes the immune system to become over-active, with white blood cells increasing in number. While this is the body's typical response to harmful invasions, such as infection, the overproduction of leukocytes causes inflammation that worsen arteries which have been narrowed by plaque build-up. Thickened arteries are the hallmark of atherosclerosis.

Atherosclerosis and Heart Attack

In the Boston-based study, Dr. Matthias Nahrendorf and his colleagues looked at the white blood cell counts of 29 junior ICU doctors who were exposed to chronic stress. They found that the doctors had especially high levels of white blood cells. This discovery mirrored the author's findings in lab rats. Mice whose arteries were already narrowed by atherosclerosis increased their white blood cell numbers when they were stressed. The resulting inflammation caused plaques to form, which, when ruptured, can cause a heart attack.

The accelerated white blood cell production promotes the development of plaque in the arteries. Over time, the plaque forms lesions which break away. The open space left by the lesion is then filled by platelets and clotting proteins. In arteries that are narrow to begin with, the rapid growth of a clot can completely block blood flow to the heart or brain and cause a heart attack or stroke.

Stress as a Risk Factor

Compared to samples taken when the medical residents were off-duty, the higher levels of leukocytes reveal how the body is affected by the stress that comes from working in a fast-paced and challenging work

environment. "Exposure to psychosocial stress is a risk factor for many diseases," said Dr. Nahrendorf.

When it comes to the prevention or treatment of a stress-related immune system response, the researchers noticed that an inhibitor-type drug could stop stem cells in bone marrow from producing white blood cells, which in turn prevents arterial plaque build-up. This finding offers some hope for the treatment of a response which originated to help people survive, but can have the opposite effect in chronically-stressful environments.

[Source: Irish Independent](#)

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