HYPOTHYROIDISM AND ATHEROSCLEROSIS

Increased Risk of Atherosclerosis in Autoimmune Hypothyroidism

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Along with smoking, hypertension, and elevated cholesterol, hypothyroidism is a significant risk factor for atherosclerosis or hardening of the arteries.

Studies of Atherosclerosis

Autopsy studies dating back to 1883 note the presence of atherosclerotic plaque in patients with hypothyroidism. Atherosclerosis comes from the Greek words athero, which means gruel or paste, and sclerosis, which means hardness. Hypothyroidism is a disease characterized by inadequate thyroid hormone production. Most hypothyroidism is autoimmune in nature and is caused by Hashimoto's thyroiditis. Since these early studies, hypothyroidism and atherosclerosis have been linked through numerous case reports, laboratory studies, and epidemiological studies.

Atherosclerosis

Atherosclerosis, which is also known as hardening of the arteries, is a condition in which deposits or plaques of fat, cholesterol, cellular waste, calcium and other substances build up in the lining of medium and large arteries. Atherosclerosis can cause large deposits of plaque to reduce arterial blood flow. However, most of the damage in atherosclerosis comes from ruptured pieces of plaque that block blood flow to organs or block a blood vessel that feed the heart, causing heart attack, or the brain, causing stroke. If arterial blood carrying oxygenated blood to the arms or legs is reduced, it can interfere with mobility and lead to gangrene.

Certain factors, such as aging, contribute to atherosclerosis. However, studies show that the process of atherosclerosis often begins in childhood. Risk factors include elevated levels of cholesterol and triglycerides, elevated blood pressure, tobacco smoke, and hypothyroidism.

How Hypothyroidism Induces Atherosclerosis

Hypothyroidism contributes to atherosclerosis by increasing low-density (LDL) lipoprotein cholesterol levels, causing diastolic hypertension (blood pressure elevation of bottom measurement), and negatively affecting vascular smooth muscle function. The effects of hypothyroidism on atherosclerosis are most pronounced in females, particularly women older than 50 years.

Studies of patients treated for hypothyroidism indicate that patients whose hypothyroidism is under-treated (TSH level greater than 4.0) have a higher prevalence of coronary artery disease than age-matched subjects. In one study of patients undergoing
coronary angiography imaging studies, patients on inadequate therapy for hypothyroidism were more likely to have angiographic progression of coronary artery disease than those with adequate replacement.

Studies show that hypothyroidism causes oxidative changes in circulating lipoproteins (blood lipids) that make these substances more likely to adhere to artery wall. Hypothyroidism also causes a decrease in high-density-lipoprotein (HDL) cholesterol that prevents its protective effects. Other risk factors for atherosclerosis associated with hypothyroidism include increased inflammation as demonstrated by an increased level of C-reactive protein (CRP), coagulation abnormalities, insulin resistance, and endothelial dysfunction.

**Subclinical hypothyroidism**

Results of the Rotterdam study showed that the risk for atherosclerosis is also elevated in people with subclinical hypothyroidism. In subclinical hypothyroidism, the TSH result is elevated while thyroid hormone levels (FT4 and FT3) are within the reference range. The increased risk of atherosclerosis in subclinical hypothyroidism is similar to other risk factors, such as elevated cholesterol, hypertension, and smoking.

**Resources:**


American Heart Association


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