



Chronic Inflammation and Oxidative Imbalance in HDL-Cholesterol Degradation Among Diabetic Patients

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DESCRIPTION

HDL and cholesterol concentration in diabetic patients are important factors that affect the risk of cardiovascular diseases. HDL is the “good” cholesterol that helps remove excess cholesterol from the blood and protects the blood vessels from damage. Cholesterol is a type of fat that is essential for many functions in the body, but too much of it can cause plaque build-up in the arteries and lead to heart attacks and strokes. Diabetic patients often have dyslipidemia, which means abnormal levels of lipids (fats) in the blood. Dyslipidemia can be caused by insulin resistance, poor glycemic control, obesity, inflammation, and genetic factors. Dyslipidemia in diabetic patients typically involves low levels of HDL, high levels of LDL (the “bad” cholesterol that contributes to plaque formation), and high levels of triglycerides (another type of fat that can increase the risk of cardiovascular diseases). A retrospective population-based cohort study found no association between HDL cholesterol levels and all-cause, cardiovascular, or cancer mortality in type 2 diabetic patients, but a U-shaped relationship with infectious disease and diabetes-related mortality. The role and function of HDL in patients with diabetes mellitus and the related cardiovascular risk discusses about the mechanisms and consequences of HDL dysfunction in diabetic patients, and the potential therapeutic strategies to improve HDL quality and quantity. Dyslipidemia Management in Adults with Diabetes provides the guidelines and recommendations for the diagnosis and treatment of dyslipidemia in adults with diabetes, based on the evidence from clinical trials and expert opinions. The relationship between High-Density Lipoprotein Cholesterol (HDL-C) and Glycosylated Hemoglobin (HbA1c) in diabetic patients describes about that HDL-C levels in diabetic patients that are inversely associated with HbA1c levels, and suggested that HDL-C may be relevant to glycemic control. HDL Cholesterol and Risk of Type 2 Diabetes

is a Mendelian Randomization Study which is used as a genetic approach to examine the causal effect of HDL cholesterol on type 2 diabetes risk, and found that HDL cholesterol is not likely to have a protective role against type 2 diabetes.

- Controlling blood sugar levels and taking medications as prescribed by the doctor
- Eating a balanced diet that is low in saturated and trans fats, cholesterol, salt, and added sugars, and high in fibre, fruits, vegetables, whole grains, lean proteins, and healthy fats
- Exercising regularly for at least 150 minutes per week, preferably in moderate to vigorous intensity aerobic activities
- Quitting smoking and limiting alcohol consumption

Taking supplements or drugs that can enhance HDL Cholesterol function, such as niacin, omega-3 fatty acids, statins, and CETP inhibitors, under the guidance of the doctor. Therefore, the function of HDL Cholesterol in diabetic patients is compromised by the presence of inflammation and oxidative stress, which can lead to atherosclerosis and other complications.

CONCLUSION

Inflammation and oxidative stress can affect the structure and composition of HDL Cholesterol, making it less effective in removing cholesterol and preventing plaque formation. They can also impair the activity of enzymes and proteins that are associated with HDL Cholesterol, such as Paraoxonase 1 (PON1) and Lecithin-Cholesterol Acyltransferase (LCAT). PON1 is an enzyme that protects HDL Cholesterol and LDL Cholesterol from oxidation and reduces inflammation. LCAT is an enzyme that converts free cholesterol to cholesterol esters, which are more stable and can be transported by HDL Cholesterol to the liver. When these enzymes are reduced or inhibited, HDL Cholesterol becomes dysfunctional and pro-inflammatory, increasing the risk of cardiovascular diseases.

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