

Triglycerides

What are triglycerides?

Triglycerides (also known as triacylglycerol or TAG) are the major transporters of dietary fats throughout the bloodstream. Specifically, it is composed of one glycerol molecule that is attached to three fatty acids, hence the term triglyceride. VLDL (very low density lipoproteins) and chylomicrons are made up largely of triglycerides. Besides transporting fat throughout the bloodstream so that it can be used for fuel, triglycerides also store fat in adipose tissue (fat cells) when the body's demand for fuel is less than what is ingested from diet.

Why measure triglycerides?

Elevated triglycerides are a major risk factor for heart disease and diabetes because high serum levels of triglycerides are indicative of abnormal lipoprotein metabolism. Extremely high triglyceride levels (over 500 mg/dL) can cause pancreatitis. Triglyceride levels should fall below 150 mg/dL. Since triglycerides go up after a meal, they are typically measured after 12 hours of fasting.

Why are high triglycerides harmful?

High triglycerides negatively affect LDL particle size. Through a complex metabolic interaction, triglycerides promote the formation of small, dense LDL particles, which are particularly atherogenic. Even in the presence of normal LDL cholesterol, patients with high triglycerides typically have endothelial dysfunction, where their blood vessels do not dilate and constrict properly. In addition, excess triglycerides lower nitric oxide levels and increase many inflammatory compounds further contributing to vascular injury and endothelial dysfunction.

Elevated triglycerides set off a cascade of events that negatively alters a patient's lipoprotein profile. For example, elevated triglycerides cause higher excretion rates of apolipoprotein A1 through the kidneys, thus leading to low HDL levels. This explains the strong inverse relationship between triglycerides and HDL.

How are triglycerides treated?

Diets high in carbohydrates increase triglyceride levels, particularly in those with insulin resistance or obesity. Specifically, decreasing the amount of ingested simple sugars will usually lower triglyceride levels. An increase in the consumption of omega 3 fatty acids, whether from food or supplements can reduce triglyceride levels substantially in a dose-dependent manner. Regular exercise also reduces triglyceride levels leading to better energy metabolism overall. Pharmaceuticals commonly used to lower triglycerides include fenofibrates (such as Tricor or Trilipix) and omega 3 fatty acids.

References

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Additional references at <http://www.spectracell.com/online-library-lpp-triglycerides-abstract>