

High insulin levels impair intestinal metabolic function

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Nutritional scientists at the University of Alberta are the first to establish a connection between high insulin levels and dysfunction of intestinal lipid metabolism in an animal model. They believe this finding supports their contention that impaired intestinal metabolic function plays a critical role in the development of cardiovascular disease.

The research was published recently in the journal *Atherosclerosis*.

The researchers have found that excessive insulin appears to slow the removal of chylomicrons from the blood stream following a fatty meal. Chylomicrons transport dietary fat from the intestine to the rest of the body.

The researchers note that excessive insulin appears to alter the mechanics of blood vessel walls, allowing chylomicrons and cholesterol to build up in them, which, over time, creates blockages in the blood stream, leading to heart problems.

"Now that we know high levels of insulin are associated with altered intestinal chylomicron metabolism and a build up of these particles in the blood vessel walls, our next step is to use this animal model to look closer at the cellular mechanisms and try to figure out how this happens," said Dr. Donna Vine, a nutritional scientist at the U of A and co-author of the paper in *Atherosclerosis*.

High insulin levels are caused by excessive consumption of sugar and

fatty foods. Perpetually high insulin levels can lead to insulin resistance, which predisposes individuals to develop Type 2 diabetes and increased risk of cardiovascular disease.

Traditionally, scientists have believed cardiovascular disease was connected to increased levels of low-density lipoprotein (LDL) cholesterol, which is derived from the liver.

However, Vine and her colleagues believe high levels of intestinal chylomicron cholesterol—which is harder to detect than LDL cholesterol—has been long overlooked as a contributor to cardiovascular disease.

It is estimated fifty per cent of cardiovascular disease events occur in the presence of normal LDL-cholesterol levels; therefore Vine believes anyone concerned about developing cardiovascular disease should not only have their LDL cholesterol levels checked but should also check the amount of chylomicrons in their blood stream.

If chylomicron levels were high, Vine said it would pay to consume less fatty foods over the day. Aside from critical dietary manipulation, there are also emerging drugs that can target intestinal cholesterol and perhaps improve chylomicron metabolism, she added.

"The ultimate goal is to learn more about the intestines' role in health and disease states, such as diabetes and cardiovascular disease, and to develop interventions that can prevent disease onset and progression.

Source: University of Alberta

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