Stopping diabetes damage with vitamin C

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Researchers at the Harold Hamm Oklahoma Diabetes Center have found a way to stop the damage caused by Type 1 diabetes with the combination of insulin and a common vitamin found in most medicine cabinets.

While neither therapy produced desired results when used alone, the combination of insulin to control blood sugar together with the use of Vitamin C, stopped blood vessel damage caused by the disease in patients with poor glucose control. The findings appear this week in the *Journal of Clinical Endocrinology and Metabolism*.

"We had tested this theory on research models, but this is the first time anyone has shown the therapy's effectiveness in people," said Michael Ihnat, Ph.D., principal investigator and a pharmacologist at the OU College of Medicine Department of Cell Biology.

Ihnat said they are now studying the therapy in patients with Type 2 diabetes.

The goal of the work being done by Ihnat and British scientists from the University of Warwick led by Dr. Antonio Ceriello is to find a way to stop the damage to blood vessels that is caused by diabetes. The damage, known as endothelial dysfunction, is associated with most forms of cardiovascular disease such as hypertension, coronary artery disease, chronic heart failure, peripheral artery disease, diabetes and chronic renal failure.

By reducing or stopping the damage, patients with diabetes could avoid some of the painful and fatal consequences of the disease that include heart disease, reduced circulation and amputation, kidney disease and diabetic retinopathy, which can lead to blindness.

Insulin and many other drugs have long been used to control blood sugar, but Ihnat - in an earlier project with scientists in Italy and Hungary - found that cells have a "memory" that causes damage to continue even when blood sugar is controlled. By adding antioxidants like Vitamin C, Ihnat found that cell "memory" disappeared and cell function and oxidation stress were normalized.

"We have speculated that this happens with endothelial dysfunction, but we did not know until now if it was effective in humans. We finally were able to test it and proved it to be true," Ihnat said. "For patients with diabetes, this means simply getting their glucose under control is not enough. An antioxidant-based therapy combined with glucose control will give patients more of an advantage and lessen the chance of complications with diabetes."

While researchers do suggest diabetic patients eat foods and take multivitamins rich in antioxidants like Vitamin C, they warn that additional study is needed. The Vitamin C utilized in their study was given at very high doses and administered directly into the blood stream, so it is unlikely someone would get similar results with an over-the-counter vitamin supplement.

The team is now working to determine how antioxidants work at the molecular level to halt the destructive chain reaction set in motion by high blood sugar levels. In addition, they are evaluating several other antioxidants with an ultimate hope that their work will translate into simple, effective and inexpensive treatments for the control of diabetes.

Source: University of Oklahoma