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Ginseng Berry Extract Shows Promise For Diabetes, Obesity

ScienceDaily (May 24, 2002) — An extract from the ginseng berry shows real promise in treating diabetes and obesity, reports a research team from the University of Chicago's Tang Center for Herbal Medicine Research. In the June issue of the journal Diabetes, they show that the extract completely normalized blood glucose levels, improved sensitivity to insulin, lowered cholesterol levels, and decreased weight by reducing appetite and increasing activity levels in mice bred to develop diabetes.

For more than 2000 years, traditional Chinese medicine has used ginseng root to treat a variety of ailments. This study focused instead on substances found in the ginseng berry, which has very different concentrations of ginsenosides, the substances thought to be medically useful.

"Ginseng berry has a distinctive chemical profile and has not previously been used for therapy," said Chun-Su Yuan, M.D., Ph.D., assistant professor of anesthesia and critical care at the University of Chicago and director of the study. "We were stunned by how different the berry is from the root and by how effective it is in correcting the multiple metabolic abnormalities associated with diabetes."

Yuan's team, which included researchers from the Tang Center, anesthesia, clinical pharmacology and medicine, studied the effects of the extract, made from the pulp of the berry. They also studied one particular substance known as ginsenoside Re, which is concentrated in ginseng berries but quite scarce in the root.

They tested the extract by injecting it once a day into mice with a gene defect that causes weight gain and type 2 diabetes. They found that —

* Daily injections of 150 mg/kg of the ginseng berry extract restored normal blood-sugar levels in diabetic mice. Blood-glusoce levels fell from 222 mg/dl (quite high for a mouse) to 137 mg/dl (normal) within 12 days. Treated mice also had better scores on a glucose tolerance test, which measures how quickly the mice could remove excess glucose from the blood.

* The extract caused diabetic mice, which were also obese, to lose more than 10 percent of their body weight in 12 days. Untreated mice gained five percent of their weight in 12 days. The treated mice ate 15 percent less and were 35 percent more active than untreated mice. Once the injections stopped, weight gain gradually resumed.

* The extract improved insulin secretion and insulin sensitivity, both of which were abnormal in mice with diabetes. Treated diabetic mice had 30 percent lower cholesterol levels than untreated diabetic mice (117mg/dl versus 169mg/dl).

* The extract had no detectable effect on normal mice.

Tests using a ginsenoside Re alone found that it had all of the anti-diabetic but none of the obesity-fighting activities of the extract.

"This novel compound could serve as the basis for a whole new class of anti-diabetic medications," said Yuan, who is also working to isolate other substances from the extract that contributed to the weight loss.

There is a pressing need for new and more effective drugs for both diabetes and obesity. Diabetes is the seventh leading killer in the U.S. Type 2 diabetes affects almost six percent of the U.S. population and 18.4 percent of those over 65. The cost of the disease is estimated at $105 billion each year.

The U.S. Surgeon General estimates that 61 percent of adults are overweight or obese. Obesity — wieghing more than 20 percent over your maximum recommended body weight — contributes to an estimated 300,000 deaths each year. The economic cost of obesity in the U.S. was about $117 billion in 2000. The rising rate of obesity also contributes to the growing prevalence of type 2 diabetes.

"Since this berry contains agents that are effective against both obesity and diabetes, the ginseng fruit has enormous promise as a source of new drugs," said Yuan, who has worked with the University to apply for a patent on the development of ginsenoside Re as a diabetes medication.

"The next step is to isolate the other substances in the extract, find out whether they also effect glucose regulation or weight gain, learn how they work and determine the safe and effective dose."

Additional authors of the study were Anoja Attele, Yun-Ping Zhou, Jing-Tian Xie, Ji An Wu, Liu Zhang, Lucy Dey, William Pugh and Paul Rue of the University of Chicago and Kenneth Polonsky, now at Washington University in St. Louis. The research was funded by the Tang Family Foundation and the National Institutes of Health.

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