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Olive leaf extract as a hypoglycemic agent in both human diabetic subjects and in rats

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Abstract

Olive tree (*Olea europaea* L.) leaves have been widely used in traditional remedies in European and Mediterranean countries as extracts, herbal teas, and powder. They contain several potentially bioactive compounds that may have hypoglycemic properties. To examine the efficacy of 500 mg oral olive leaf extract taken once daily in tablet form versus matching placebo in improving glucose homeostasis in adults with type 2 diabetes (T2DM). In this controlled clinical trial, 79 adults with T2DM were randomized to treatment with 500 mg olive leaf extract tablet taken orally once daily or matching placebo. The study duration was 14 weeks. Measures of glucose homeostasis including HbA1c and plasma insulin were measured and compared by treatment assignment. In a series of animal models, normal, streptozotocin (STZ) diabetic, and sand rats were used in the inverted sac model to determine the mechanism through which olive leaf extract affected starch digestion and absorption. In the randomized clinical trial, the subjects treated with olive leaf extract exhibited significantly lower HbA1c and fasting plasma insulin levels; however, postprandial plasma insulin levels did not differ significantly by treatment group. In the animal models, normal and STZ diabetic rats exhibited significantly reduced starch digestion and absorption after treatment with olive leaf extract compared with intestine without olive leaf treatment. Reduced digestion and absorption was observed in both the mucosal and serosal sides of the intestine. Though reduced, the decline in starch digestion and absorption did not reach statistical significance in the sand rats. Olive leaf extract is associated with improved glucose homeostasis in humans. Animal models indicate that this may be facilitated through the reduction of starch digestion and absorption. Olive leaf extract may represent an effective adjunct therapy that normalizes glucose homeostasis in individuals with diabetes.

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