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**File: ■ Aloe Vera (*Aloe vera*, Xanthorrhoeaceae)
■ Diabetes
■ Hypolipidemic Effects**

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RE: Review of the Hypoglycemic and Hypolipidemic Effects of Aloe Vera

Pothuraju R, Sharma RK, Onteru SK, Singh S, Hussain SA. Hypoglycemic and hypolipidemic effects of *Aloe vera* extract preparations: a review. *Phytother Res*. February 2016;30(2):200-207.

Type 2 diabetes is often associated with alterations in metabolism, free fatty acid accumulation, inflammation, and oxidative stress. There are several standard pharmaceutical treatments; however, they may not treat all associated symptoms and may cause adverse side effects. Aloe vera (*Aloe vera*, Xanthorrhoeaceae) has been used traditionally in many countries throughout the world for skin ailments and gastrointestinal problems. This review highlights studies on the potential use of aloe vera to treat diabetes and its symptoms.

Aloe vera contains anthraquinones, phytosterols, carbohydrates, and other bioactive compounds. Phytosterols have been found to aggregate cholesterol, resulting in lower systemic cholesterol levels. A polysaccharide called acemannan has been shown to have anti-inflammatory effects via the activation of cytokines. In mice with diabetes, aloe vera phytosterols significantly decreased both fasting blood glucose concentrations and glycated hemoglobin (HbA1c). In rats with diabetes, 300 mg/kg of an ethanolic extract of aloe vera elevated insulin concentrations and normalized blood glucose levels. This extract also resulted in lower lipid, cholesterol, and kidney triglyceride concentrations.

Aloe vera extract at 0.5% and 1% weight per volume was shown to increase the count of *Lactobacillus casei*, a potentially beneficial species of gut microbiota. In diabetic rats, a water extract modulated the activity of an enzyme critical to gluconeogenesis and lowered lipid peroxidase activity. Phytosterols in aloe vera increased the expression of peroxisome proliferator-activated receptor-gamma and -alpha (PPAR γ and PPAR α , respectively), as well as many other genes upstream of metabolic processes, such as fatty acid oxidation and gluconeogenesis, in obese mice. In cells, aloe vera extract activated glucose transporter type 4 (GLUT4) expression, the protein transporter involved in glucose uptake.

There have been several clinical trials for aloe vera's potential use in treating diabetes. Patients with diabetes taking a fraction of aloe vera containing acemannan and the glycoprotein verectin three times per day for 12 weeks were shown to have lowered fasting blood glucose and triglyceride concentrations. The mechanism of this activity is thought to be due to the attenuation of glucose absorption from acemannan's metabolites. Those with diabetes taking one 600-mg capsule daily of aloe vera leaf gel had lowered blood glucose, total cholesterol, and low-density lipoprotein (LDL) cholesterol concentrations.

In those with prediabetes or early diabetes, aloe vera gel consumption for eight weeks lowered body weight, fat mass, fasting blood glucose, and insulin concentrations. Patients with diabetes taking aloe vera gel powder at 100 mg and 200 mg for three months [it is assumed daily] had a decrease in fasting and fed glucose, blood pressure, triglycerides, and total and LDL cholesterol concentrations. In another study of aloe vera extract administered at 300 and 500 mg twice daily for eight weeks in patients with prediabetes, those taking 300 mg had significantly lower fasting blood glucose concentrations, while those taking 500 mg had decreased HbA1c, total cholesterol, and LDL cholesterol levels.

In a study in patients with diabetes, 60 days of 600 mg per day of aloe vera extract did not result in any adverse side effects on kidney or liver functions. In another 12-week trial, aloe vera fractions did not cause adverse side effects; however, aloe vera was thought to cause diarrhea and vomiting in a separate study.

Although many of these studies suggest that aloe vera may be efficacious in treating diabetes, it is mentioned that various extracts and preparations showed different bioactivity. The authors state that future work investigating aloe vera whole extract is necessary for determining mechanisms of action.

—*Amy C. Keller, PhD*

The American Botanical Council has chosen not to reprint the original article.

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