

MEDICAL IMPLICATIONS OF PRICKLY PEAR CACTUS

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Herbal remedies for diabetes mellitus are distributed worldwide. Some investigators have compiled more than 130 "medicinal" plants with supposed beneficial effect in diabetes. Nevertheless, only in about 30 of them has an antidiabetic effect been proven. Several plants have been used in Mexico as popular treatment for diabetes, including prickly pear cactus (nopal, Opuntia spp.). For that purpose Opuntia stems are ingested broiled, blended or as juice. Since 1979 there was experimental evidence indicating that Opuntia stems could decrease blood glucose levels in diabetic animals, and there were a few anecdotal reports of improvement of diabetes in human beings by this cactus. Recent studies performed at Centro-Medico "La Raza" have shown some interesting medical properties, as follows:

1. The intake with the meals of broiled Opuntia stems, during 10 days, improved glucose control in a small group of adults with non-insulin-dependent diabetes mellitus (NIDDM) (Frati et al., 1990).
2. Serum glucose rising which follows the intake of a sugar load (oral glucose tolerance test) is lower with previous ingestion of Opuntia stems than if the sugar is ingested alone (Frati et al., 1989)
3. The effect on glucose tolerance test is dose related.
4. These findings might be ascribed to dietary fibers of Opuntia, since similar results can be achieved by Plantago psyllium mucilage or other sources of dietary fibers.
5. Opuntia stems administered to diabetic, obese and healthy volunteers, caused a diminution of serum levels of triglycerides, total cholesterol and LDL-cholesterol, while HDL-cholesterol did not change and the "atherogenic index" improved (Frati et al., 1983). Body weight also decreased in obese subject. These results were similar to those obtained with Plantago psyllium by our group, and also can be ascribed to dietary fibers.
6. In patients with NIDDM, the ingestion of some species of nopal (Opuntia streptacantha, O. ficus-indica) in fasting condition is followed by a decrease of serum glucose and serum insulin levels. This hypoglycemic effect does not depend on the rate of food absorption and it is not shared by dietary fibers. Thus, a substance with hypoglycemic property is suggested.
7. The mechanism of this hypoglycemic effect is unknown. However it is not through the enhancement of insulin releasing, since serum insulin levels diminished. Thus an improvement in cellular sensitivity to insulin is suggested.

8. This hypoglycemic effect is dose-related and it is noticed with 300 grams of more of Opuntia stems. The effect is weak: with the ingestion of 500 g of the cactus, blood glucose levels decreased in three hours 30 to 40 mg/dl less than the initial value.
9. The hypoglycemic activity is progressive, reaching its greatest effect at 3 to 4 hours post-ingestion, and it lasts at least until the 6th hour.
10. Physical treatment of the stems might inactivate this property, but broiled, blended, cold or heated Opuntia stems still had the hypoglycemic effect.
11. The hypoglycemic effect was also noticed in healthy volunteers with experimentally intravenously induced hyperglycemia. However, it did not occur in healthy individuals with normoglycemia. Thus, it is safe, even if eaten in large amount.
12. Undesirable side effects of Opuntia intake are only an increase in stool volume and frequency and abdominal fullness.

Semipurified Opuntia extracts are currently under investigation. Beneficial effects in diabetic subjects include decreasing in serum glucose and lipids, and reduction of obesity. However, at present Opuntia stems cannot be recommended as a hypoglycemic agent because of the lack of long-term clinical studies, and also because ideal doses and preparation are not determined. Opuntia is a low-caloric, high-fiber which may be recommended as a component of the diet, as well as other fiber-rich vegetables.

References

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