

Hypoglycemic Effect of an *Opuntia streptacanta* Lemaire Dialysate

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INTRODUCTION

Non-insulin-dependent diabetes mellitus (NIDDM) is the most frequent metabolic disorder among the Mexican population (Zarate, 1991). It is considered a public-health problem by the medical community in Mexico (Escobedo de la Peña, 1993).

Because good glyceic control (less than 140 mg/dl) is so difficult to achieve by many NIDDM patients treated with oral hypoglycemic drugs, nonpharmacological alternatives, such as traditional plants, have proven to aid in control (Bailey and Day, 1989; Roman-Ramos et al., 1991). *Opuntia streptacantha* Lemaire is one of those plants (Frati-Munari et al., 1988).

Several reports confirm an important *Opuntia streptacantha* Lemaire hypoglycemic effect up to three hours after its ingestion in different preparations. Moreover, there is a direct correlation between *Opuntia* doses and its hypoglycemic effect (Frati-Munari et al., 1989). However, doses larger than 300 mg represent a limitation because it is very difficult for NIDDM patients to eat the *Opuntia* for long periods of time.

To avoid this limitation, we studied the effect of an *Opuntia streptacantha* Lemaire dialysate on NIDDM patients.

MATERIAL AND METHODS

Eight NIDDM ambulatory patients were selected nonrandomly and studied for two weeks. Six were women and two were men. Two groups were formed. Group A received *Opuntia streptacantha* Lemaire dialysate; Group B received a placebo. Four patients were assigned randomly to each group and crossed over one week later.

Dialysate was prepared following the method described by Ibañez-Camacho (1979) and administered in 250-mg vegetable capsules in a single dose immediately after a basal venous-blood sample was drawn. The placebo was an empty capsule of similar characteristics that also was taken only one time.

Before study initiation, oral hypoglycemic drugs were suspended for 72 hours and patients fasted for 12 hours. Venous-blood samples were obtained at 0, 60, 120, and 180 minutes to measure serum glucose concentrations.

All patients gave written consent before beginning the study.

Results are expressed by means and 95% confidence intervals (95% CI). Statistical analysis was made through nonparametric tests of Friedman variance analysis and Wilcoxon.

RESULTS

Mean age was 58.4 years and 95% CI from 48.9 to 67.8.

Basal serum glucose concentration (0 minute) was 290 mg/dl (338 to 243) in Group A and 268.8 mg/dl (320 to 218) for Group B, NS]; at 60 minutes, glycemia decreased in both groups, 270 mg/dl (319 to 220) in Group A and 252.3 mg/dl (306 to 199) in Group B, NS; after 120 minutes, decremting continued to 250.4 mg/dl (306 to 201) in group A and 238.4 mg/dl (289 to 189) in Group B, NS; and, at last measurement (180 minutes), serum glucose concentration was 230.8 mg/dl (281 to 180) with dialysate and 218.9 mg/dl (265 to 173) with placebo, NS.

When mean basal serum-glucose concentration was compared against the last sample, decreases of about 20.4% in Group A and 18.6% in Group B were observed. In both groups, these differences reached statistical significance ($P < 0.001$).

DISCUSSION

Since Ibañez and Camacho made their first description about a hypoglycemic effect of *Opuntia streptacantha* Lemaire almost 20 years ago (Ibañez-Camacho, 1978), several published studies point out its properties over some parameters used to monitor carbohydrate and fat metabolism in NIDDM patients.

This hypoglycemic property represents an inexpensive nonpharmacological coadyutant to treat noncontrolled NIDDM patients because of its great acceptability to be consumed by the Mexican population as food in different preparations. Thus, it will be easy to prescribe nopal.

In this study we assessed an *Opuntia streptacantha* Lemaire dialysate in order to find an alternative presentation that is readily available and more acceptable in daily consumption than classical whole-cladode ingestion. Such an alternative would allow NIDDM patients to employ the benefits of nopal for long periods of time.

Our results demonstrated that an *Opuntia streptacantha* Lemaire dialysate retained its hypoglycemic property. The decrement observed was about 60 mg/dl over basal glycemia three hours after the dialysate was administered. However, we should acknowledge that the placebo also produced a hypoglycemic effect of about 50 mg/dl in the NIDDM patients studied.

Perhaps a wash-up period of one week was not enough, or we should have chosen another study design, such as a clinical therapeutical trial without crossover to avoid contamination.

Further studies are needed to decide if *Opuntia streptacantha* Lemaire dialysate could be considered a new approach in treating NIDDM patients.

Finally, we could think that maybe *Opuntia streptacantha* Lemaire possesses a fiber-independent substance that causes glycemic reduction in NIDDM patients.

The next question is: What is the responsible mechanism? A possible hidden hypoglycemic substance in nopal still awaits discovery.

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