Trial of Momordica Charantia Linn (Karela) Powder in Patients with Maturity-Onset Diabetes

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Abstract

Powdered whole Aloviordica charantia fruit (bitter gourd) was tried on eight patients suffering from uncomplicated maturity-onset diabetes. The patients were told to take the, powdered drug in milk twice daily at the rate of 50 mg/kg body weight, to continue on the carbohydrate deficient diet as before, and not to take any other medication. The results obtained show that the drug produced a consistent hypoglycaeinic effect in all the patients. The mean blood sugar levels after drug treatment at fasting, 12 hour, 1 hour, hour and 2 hours after 50 g oral glucose were found to be significantly lower than those before starting administration of Karela powder. No adverse side effects were observed in any of these patients (JPMA 32:106, 1982).

Introduction

It has recently been reported that the whole dried powdered fruit of a plant known as A'Iornordica charantia L. (Bitter Gourd, Karela) possesses a significant and consistant hypoglycaemic effect in normal and alloxandiabetic rabbits (Akhtar et ql., 1981). It was also hypothesized that this fruit contains more than one type of hypoglycaemic components. These may include an alkaloid (Charantin) and an orally active insulin (V-insulin) or some like compound. It is well known that the Karela is a common table article and is in use since centuries for many varied medicinal purposes. Many diabetics add the fruit to their diets and different parts of the Montordica charantia plant are still being allegedly administered to treat human diabetic patients (Said, 1969; Nadkarni, 1954). Stimulated by the folkloric use and the production of well marked hypoglycaemic response in normal and diabetic rabbits, its easy and abundant availability in our country, the present investigation was undertaken to clinically evaluate the effect of whele, dried and powdered Momordica charantia fruit on the fasting blood glucose levels and glucose tolerance of the human patients with maturity-onset diabetes mellitus.

Material and Methods

Plant Material

Fresh green fruit of the Momordica ch arantia L., popularly known as Karela, was obtained in sufficient quantity from the vegetable market of Faisalabad (Punjab) in June, 1981. They were carefully washed with tap water to remove dust and any other foreign material and dried under the shade but not in the sun. The cornpletely. dried fruit was powdered with an electric grinder and stored in well closed cellophane bags at 4°C in the refrigerator.

Patients

Eight out-door patients attending Agriculture University Hospital for the treatment of diabetes were randomly selected for this trial. They gave informed consent for this trial. These patients were already diagnosed to suffer from un-controlled and uncomplicated maturity-onset diabetes. There were 4 males and 4 females and were of 38-50 years of age. Duration of disease ranged between 3 months to 10 years,

Procedure

All previous antidiabetic medication of these selected patients which was usually an oral hypog! ycaemic agent was completely stopped 24-48 hours Prior to the study. Then oral glucose tolerance tests were carried out. Their blood and urine sugar level were determined at fasting and at hour, 1 hour, I hour, and 2 hours intervals after 50 g glucose orally. On 50 mg/kg body weight basis, the amount of powdered Karela required by each patient was calculated. Each of the patient was given 14 doses and were told to take one such dose of' the powder orally after breakfast and another dose after dinner alongwith some milk. They were also told to continue on the carbohydrate restricted diet which they were already taking and were asked not to take any other medication. Daily urine sugar was tested during the trial by using the Benedicts reagent. After 7 days of drug intake, the oral glucose tolerance tests were again performed. Blood glucose levels were determined by the method of Fings et al.(1970) using the Ortho-toluidine reagent.

Results and Discussion

All the 8 maturity onset diabetic patknts who received the whole dried and powdered fruit of Momordica harantia (Karela) showed considerable improvement in all respects. The excretion of sugar in urine started decreasing on about 3rd day and became nil in all the patcnts by the end of 7 days of drug intake. Similarly, glucose tolerance (50 grams oral) improved greatly in all patients under trial as shown in the figure.

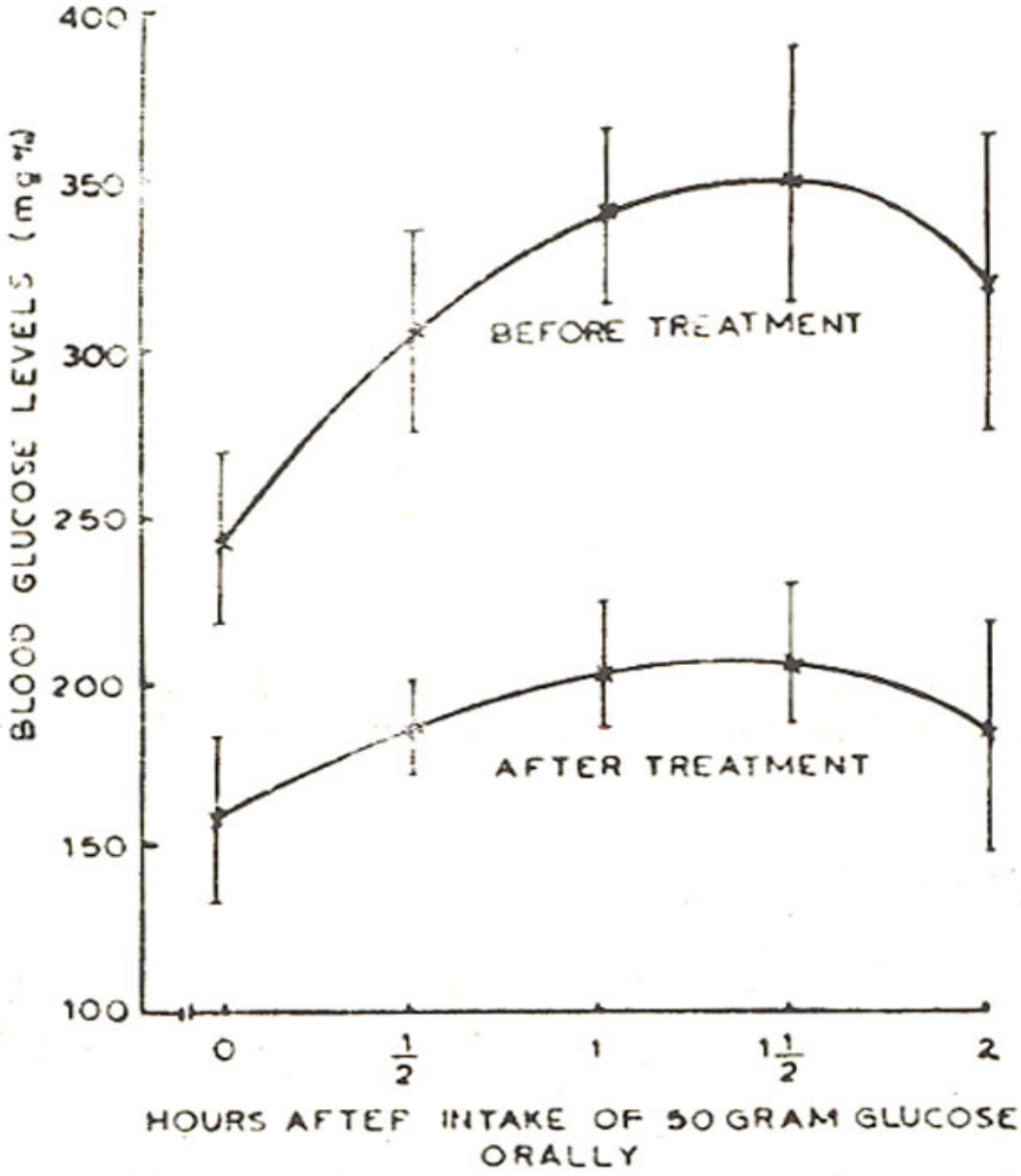

Fig.: Glucose Tolerance Curves of patients with maturity-onset diabetes before and after 7 days of treatment with *Momordica Charantia* (50 mg/Kg orally) twice daily.

Mean post-treatment blood glucose levels at all the time intervals were significantly lower than their respective pre-treatment values. In the treated patients, fasting glucose level was decreased from 248±20 to 155±23 mg and the glucose levels at 12, 1, 1 and 2 hours time intervals after 60 grams glucose intake were 195±12 vs 302±26, 205±16 vs 340±24, 210±50 vs 358±25 and l80+-30 vs 310±28

mg% respectivelv. All these values were found to be highly significantly ($P < 0.001$) different from each other. Virtually no change in weight was observed and the complete urine examination also revealed no abundantly. None of the patients showed any visible signs of toxicity nor any other side effect was reported by the patients.

From this stuth it may be concluded that the Karela powder could be recommended for the oral treatment of patients with uncomplicated maturity onset-diabetes especially when there are no adverse or side effects during 7 days of its use. This is not surprising because the plant is commonly used as a vegetable since centuries. 1954; Said, 1969). In addition, similar hypoglycaemic activit.y has recently been reported by Khan et al. (1980) in the Coccinia indica. The Karela powder produced significant hypoglycaemia in both normal and alloxan-diabetic rabbits (Akhtar et àl., 1981). Previously, Khanna et al. (1974) have been able to extract out the V-insulin which in a clinical study have showed a consistent hypoglycaemic effect in patients with diabetes metlitus (Baidwa et aL, 1977). Therefore, it is conceivable that its active principles also in-clude an orally active form of insulin i.e., vegetable insulin (V-insulin) or some, like substance. Similarly, Mukherjee et al. (1972) have also concluded that the active principles of the Coccinia. in dica is some insulin-like substance. Availability of .such insulin from abundantly available AIomorthca charantia plant should open new horizons especially where it is taboo to use animal products. Some of the patients who received Karcia powder fir 7 clays claimed to remain all right even without any medication for about 1-2 months. This may lead to the supposition that the continuous usc of this plant drug may cure the diabetics or at least 1)Cflefit them for longer periods. Of course, clinical trials on larger scale would be needed to further establish its antidiahetic efficacy, its duration of action and various effects on intermediary metabolism in human beings. Chronic toxicity studies in animals must also be carried out to declare its total safety for prolonged use in human beings.

Acknowledgements

Autnor is thankful to 1)r. Abdul Raoof Chaudhry, Senior Medical Officer, University of Agriculture I-iospital, Faisalabad for referring the diabetic patients for this study.

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