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ORIGINAL ARTICLE

EFFECT OF THE INSULIN PLANT (*Costus igneus*) LEAVES ON BLOOD GLUCOSE LEVELS IN DIABETIC PATIENTS: A CROSS SECTIONAL STUDY.

Shetty AJ*, Parampalli S.M**, Bhandarkar R***, Kotian .S.****

ABSTRACT

BACKGROUND: The complications of Diabetes mellitus are related to glycaemic control. Normoglycaemia or near normoglycaemia is the desired, but often elusive, goal for most patients. Regardless of the level of hyperglycaemia, improvement in glycaemic control will lower the risk of diabetes complications. Consumption of the leaves of the insulin plant has been claimed to achieve glycaemic control and hence, we have planned the present cross sectional study in diabetic patients. **AIM OF THE STUDY:** Analysis of glycaemic control in diabetic patients who have been consuming the leaves of the insulin plant and to know the adverse effects/ benefits of insulin plant leaf consumption. **MATERIALS AND METHODS/ STATISTICAL ANALYSIS:** A cross sectional study was conducted after taking informed consent from the patients. Retrospective data was collected from diabetic patients who consumed the leaves of the insulin plant. Wilcoxon's paired test was the statistical method which was used for analysis of the data. **RESULTS AND CONCLUSION:** Statistically significant reduction in the fasting and postprandial blood sugar levels in all the patients who consumed the leaves.

Key Words: Blood glucose, Diabetes, insulin plant leaves.

*Associate Professor, Dept. Pharmacology, Kasturba Medical College, Mangalore, Manipal University, Karnataka, India.

MBBS Student, *Ayurvedic practitioner, Mangalore, Karnataka, India. ****Sr. Gr. Lecturer, Dept. Community Medicine, Kasturba Medical College, Mangalore, Manipal University, Karnataka, India.

Corresponding author:

E-mail: shettyakhila@yahoo.com

Introduction:

Epidemiological studies over the last three decades have shown a fivefold increase in the prevalence of diabetes in India. Primary prevention studies have shown a significant reduction in the relative risk of the development of diabetes using lifestyle modifications as well as drugs like metformin, acarbose and rosiglitazone, among others. The use of such strategies which are adapted to suit the local culture along with the use of traditional

approaches like yoga and ayurveda, would go a long way in responding to the challenges.^[1] When compared to non-diabetics, patients with diabetes have an increased risk of morbidities involving multiple organ systems. There is a 25 fold increased risk of renal failure, 20-fold risk of blindness, 40-fold risk of amputation, threefold risk of stroke and fivefold risk of myocardial infarction. The expected lifespan is reduced by an average of 15 years.^[2] In the developed world, diabetes is the leading cause of blindness, end-stage renal disease and amputation. Besides morbidity and mortality, these disorders impact the socio-economic status of individuals as well as the state.^[3]

Costus igneus leaves (Zingiberaceae family), the leaves of the so called INSULIN PLANT (picture1), have been claimed to have antidiabetic effects in the ayurvedic system of medicine, as a treatment for diabetes. Hence, we had planned the present cross sectional study in

Dakshina Kannada district, Karnataka, India, to validate the claims which were made.



The insulin plant

Aims of the study:

1. To assess the effect of the leaves of the insulin plant on the blood sugar levels of diabetic patients.
2. To know the adverse effects/ benefits of the insulin plant leaves treatment.

Material and Methods:

A cross sectional study was conducted after taking informed consent from the patients. Retrospective data was collected from diabetic patients who consumed the leaves of the insulin plant, in addition to allopathic medicines.

Inclusion criteria:

Patients with diabetes mellitus who consumed the leaves of the Insulin Plant for a minimum of one month were included in the study.

Exclusion criteria:

Patients who were irregular in their treatment, patients who had other comorbidities which were related to the cardiovascular and renal

systems, children and pregnant women with diabetes.

The study was conducted from 01-10-08 to 31-05-09. Laboratory reports that contained fasting blood sugar levels before and after consumption of the leaves of the insulin plant were analyzed. Patients were interviewed regarding the amount of leaves consumed, duration of the treatment, benefits and adverse effects.

Results:

There were 24 males and 6 females, whose ages ranged from 47-65 years. These patients did not have any other medical problems. They were diagnosed to have diabetes since the past 3 to 30 years. The number of patients receiving insulin injection were 12, those receiving oral hypoglycaemic treatment were 14 (metformin 10, metformin with glibenclamide 4) and those receiving non-allopathic therapies for diabetes mellitus were 4. All the patients took one fresh leaf / 1 tea-spoon of shade dried leaf powder in the morning on an empty stomach without discontinuing their past treatments for diabetes; The fasting blood sugar level decreased in all the thirty patients. The benefit of the insulin leaf therapy was noted from day fifteen ($p < 0.001$, Wilcoxon's paired test). Prolonged duration of consumption of the leaves improved glycaemic control. The glycaemic control on the 60th day was better than that on day 15 and day 30 ($p < 0.001$). In patients who had non healing leg ulcers (4) and recurrent urinary tract infections (2), the problem resolved within day fifteen to day sixty; Cataract surgery could be successfully performed (6) after treatment with insulin plant leaves for fifteen days ; The dose of insulin could be reduced to half in all the 12 patients who were on insulin. Patients who were on oral hypoglycaemic drugs (14) and non-allopathic medications (4), whose blood glucose was not under control, could get their blood glucose levels under control after the consumption of the leaves. There were 4 patients with non healing leg ulcers who reported healing. 6 patients who could not undergo surgery for cataract due to fluctuating high fasting blood sugar could successfully undergo surgery with no post operative

complications. 2 patients with a history of recurrent urinary tract infection did not suffer from it any longer. No retinopathy, nephropathy, neuropathy or cardiovascular events due to diabetes were reported in these patients. They are continuing to take the leaves since it is beneficial for glycaemic control and since it also protects them against the development of diabetic complications.

Discussion: The management of diabetes involves primary and secondary prevention strategies. At-risk individuals with obesity, low physical activity and a family history of disease could be advised interventions to prevent the occurrence of the disease.

Secondary prevention involves patients who have already developed the disease, with the aim of intervention to prevent complications. This usually involves the use of drugs and therapies for the specific disorder.^[1] As diabetes is a disorder which results from changes in the lifestyle, most studies on primary prevention have involved the modification of the same. A healthy lifestyle with regular exercise/physical activity and the consumption of a fibre rich, low-calorie healthy diet has been the primary intervention. Lifestyle intervention with a combination of regular physical activity and dietary advice showed an impressive reduction in the risk of developing diabetes in all the studies.^[1]

Secondary prevention involves the management of diabetes with an aim to prevent complications. Various studies have shown that the tight control of hyperglycaemia reduces micro vascular and macro vascular complications.^[4]

Besides this, control of blood pressure, dyslipidaemia and use of anti-thrombotics form the pillars of overall diabetes management. Control of obesity, dyslipidaemia, blood pressure, insulin resistance, dysglycaemia and the pro-thrombotic and pro-inflammatory states results in lower cardiovascular events.^[1] There are Insulin dependent Diabetics and Non insulin dependent Diabetics.

The majority of non insulin diabetic patients will fail to respond to diet and oral agents and will eventually require insulin therapy to control

hyperglycaemia.^[5] There has been a growing need to develop better and more convenient drugs. There are certain management issues that are unique to India due to its tradition, culture, geography and people at large. Ayurveda, the science of life, originated in India, more than 5000 years ago. It has been traditionally used as a system of medicine to promote health and well-being and to relieve ailments using a holistic approach. In this country, a proportion of the population follows this system of medicine, either solely or in combination with allopathic medicine. Diabetes management in Ayurveda includes diet, behaviour and herbal modalities. Various herbs have been reported to be having anti-hyperglycaemic actions. Some of these like karela, turmeric, spinach and fenugreek seeds among others, can be the part of a healthy diet.^[6] Because the complications of DM are related to glycaemic control, normoglycaemia or near normoglycaemia is the desired, but often elusive, goal for most patients. Regardless of the level of hyperglycaemia, improvement in glycaemic control will lower the risk of diabetes complications.^[7] Regular consumption of insulin plant leaves has provided statistically significant glycaemic control ($p < 0.001$, Wilcoxon's paired test) and has prevented the onset of diabetic complications when consumed in addition to the past treatments for diabetes. A controlled trial with larger sample size is desired.

Conclusion: Regular consumption of insulin plant leaves in conjunction with other modalities of treatment has effectively provided glycaemic control in diabetics; the dose of insulin could be reduced to half. Blood sugar levels which were earlier not controlled with oral hypoglycaemic drugs or non allopathic treatments were controlled. The risk of diabetic complications was avoided and no adverse effects due to the consumption of insulin plant leaves were reported. Glycaemic control was evident from day fifteen. Regular consumption is necessary for benefits to be observed.

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Conflict of interest- NONE

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