Role of medicinal plant *Salacia Reticulata* in the management of Type II Diabetic subjects

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Abstract: *Diabetes mellitus is one of the leading causes of death and ranks third among the chronic diseases. Recent studies have shown that up to 10 % of India's urban population and 2 % of the rural population above the age of 15 years have diabetes and WHO had declared India as the diabetic capital of the world. India has wealth of medicinal plants, and these plants have credited to the development of therapeutic agents for various ailments and diseases. Bark of Salacia Reticulata was screened for its hypoglycemic and hypo-lipidaemic effect. A total of 60 type II diabetics were enrolled, consisting of experimental group 30 and control group 30. Experimental group received 2 grams of Kadalazhinjil powder daily for a period of 90 days and control group did not receive any supplements. Blood glucose levels before and after medications were estimated in both groups at baseline and at 90 days. There was insignificant reduction in fasting blood glucose, HbA,c and lipid levels at the end of 90 days in the supplemented group. The experimental group showed encouraging results which call for long term supplementation in Diabetes Mellitus.*

Introduction

Medicinal plants and herbs are a source of active principle capable of curing human ailments. The active principle differs from plant to plant due to their biodiversity (Nirula, 2002). They play a key role **in** the human health care. A number of plants have shown to possess antidiabetic activity (Juss, 2006).

In India many plants have been used since ancient times for the management of diabetes. In general in recent years WHO has recommended 25,000 herbs for testing their biopharmaceutical effect. (Supriya, 2001).

Salacia reticulata, known as *"Ponkoranti"* *in Tamil* has been used in *Ayurveda* since ages for the treatment of diabetes, its synonyms *Mehari* and *Mehanashini* indicate its antidiabetic property. It has the property to obstruct and restrain an enzyme, which compounds glucose in the intestinal wall. It is used in the preparation of herbal teas for diabetes. The plants possess stimulant, laxative, diuretic, cardiotonic, anthelmintic and antidiabetic properties (Yaman, 2001).

It appears to greatly increase the number of insulin secreting beta cells in the pancreas, while returning blood sugar levels to near normal. It increases the activity of enzymes responsible for glucose uptake and utilization (Kakly et al., 2001).

Materials and Methods

A total of two hundred type II diabetics of both sex between 45-60 years of age with fasting plasma glucose levels above 120 mg/dl and post prandial glucose level above 200 mg/dl were selected for the study using purposive sampling technique. From the two hundred subjects, a sub sample of forty subjects were selected as per the above criteria and grouped as I, II each consisting of 20 subjects. For group I two grams of *Salacia reticulata* powder were given in the form of capsules for a period of 60 days and group II served as control. Blood glucose levels before and after medications were estimated in both the groups.

An interview schedule was used to elicit information regarding socio-economic background, life style and dietary pattern. Anthropometric measurements such as height weights were measured using a standard stadiometer and standardized weighing scale respectively. Waist and hip were also recorded and finally BMI and WHR was calculated. Food and nutrient intake of individuals were assessed for the subjects using diet recall method.

Administration of the supplement

Salacia reticulata bark was purchased, cleaned, dried in a shadow and then pulverized, mixed and sieved to get a fine powder. This powder was filled (1 g in each capsule) in an empty capsule and then supplemented along with breakfast.

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On the first day of experimentation the patients were asked to report to the lab in a 10 12 hr fasting. Initial fasting and post prandial (2 hrs after consumption of food) blood samples were drawn from the subjects. Then each subject were given a supplement of 2 grams of *Salacia reticulata*

powder in the form of capsule (2 capsules daily) and asked to consume for a period of 60 days .After 60 days fasting and postprandial levels were once again determined to assess the impact of the administration.

Results and Discussion:

Supplementation with *Salacia reticulata* bark capsule

i. Blood glucose level

Mean Blood Glucose Levels of the Selected Diabetic Subjects Supplemented with *Salacia Reticulata*

Blood Glucose	Desirable level*	Experimental Group I (HCKL)			Control Group		
		Mean ± SD		't' value	Mean ± SD		't' value
		Initial	Final		Initial	Final	
Fasting (mg/dl)	80-115	161.73±15.05	153.47±14.77	11.760**	167.83±14.54	169.7±12.39	1.603 NS
Post-prandial(mg/dl)	120-160	281.6±19.65	272.5±19.05	19.967**	283.1±24.61	285.97±25.21	5.682**
Glycosylated Hb (%)	<8	10.27±0.62	9.17±0.64	13.706**	10.42±0.71	10.46±0.66	1.682 NS

* Bamji *et al*., 2003;** - Significant at (P<0.01) level;NS Not Significant

Table 1 gives the details of the blood glucose, glycosylated hemoglobin of the diabetic subjects, before and after supplementation with *Salacia reticulata* bark powder capsule.

The above table showed that the mean fasting blood glucose level of the diabetic subjects in the supplemented group was 161.73 mg/dl which was reduced to 153.47 mg/dl after supplementation with *Salacia reticulata* bark powder with a statistical significance at (P<0.01) level.

The mean post prandial blood glucose level of the experimental group was found to be 281.6 mg/dl in the beginning of the study and it was reduced to 272.5 mg/dl at the end of the study period, when the values

were statistically analyzed the difference was significant at (P<0.01) level. The mean glycosylated hemoglobin levels of the *Salacia reticulata* bark powder capsule supplemented group were found to be 10.27 % in the initial stage of the study and it was reduced to 9.17 % at the end of supplementation period, when the values were statistically analyzed the difference was significant at (P<0.01) level. The values between the experimental and control group were statistically analyzed; the difference was significant at one per cent level.

The mean fasting blood glucose levels of the control group did not show any significant difference.

ii. Lipid profile

Mean Serum Lipid Profile Levels of the Selected Diabetics Supplemented with *Salacia Reticulata* Powder

Lipids	Desirable level (mg/dl) (NCEP, 2001)	Experimental Group I (HGKL)			Control Group		
		Mean ± SD		't' value	Mean ± SD		't' value
		Initial	Final		Initial	Final	
Total cholesterol	150 – 200	262.2 ±38.57	255.13 ±38.15	2.842**	283.53 ±60.83	285.5 ±60.2	0.691 NS
HDL cholesterol	30 – 60	47.67 ±14.00	49.33 ±12.79	4.949**	45.57 ±12.68	44.37 ±11.75	0.423 NS
LDL cholesterol	66 – 178	178.90 ±42.89	171.5 ±42.02	11.083**	201.63 ±58.83	203.4 ±58.07	0.025 NS
VLDL cholesterol	6 – 30	35.63 ±9.48	34.3 ±9.60	10.780**	36.33 ±7.86	36.61 ±8.21	0.932 NS
Triglycerides	30 – 170	177.50 ±47.39	171.37 ±47.80	10.492**	182.53 ±39.73	183.03 ±41.11	0.578 NS

** Significant at (P<0.01) level NS- Not significant

Table 2 gives the details regarding the lipid profile of the diabetic subjects, before and after supplementation with *Salacia reticulata* bark powder capsule.

Results of the above table revealed that the mean total cholesterol level of the diabetic subject was 262.2 mg/dl and it had decreased to 255.13 mg/dl after the supplementation for a period of three months. This decrease was found to be statistically significant at (P<0.01) level. The mean total cholesterol level of the control subjects was found to be not statistically significant.

The mean HDL-cholesterol level of the control group was found to be 45.57 mg/dl at the start of the study and 44.37 mg/dl at completion of the study. No significant difference was noticed between these levels. The mean LDL-cholesterol level of the diabetic subjects in the experimental group was 178.90 mg/dl before supplementation and the same significantly (P<0.01) decreased to 171.5 mg/dl after supplementation.

The mean LDL-cholesterol level of the control group was 201.63 mg/dl before and 203.4 mg/dl after supplementation period. This difference was found to be not statistically significant.

The mean VLDL-cholesterol levels of the diabetic subjects in the supplemented group were 35.63 mg/dl before supplementation and the same had decreased to 34.3 mg/dl after supplementation. The difference between the two values was found to be not statistically significant (P<0.01). The mean VLDL-cholesterol level of the control diabetic group was found to be

36.33 mg/dl before and 36.61 mg/dl after the study period. No significant difference was observed between the two values

Conclusion

The present study confirms that *Salacia reticulata* powder capsule is very effective in reducing blood glucose, glycosylated hemoglobin, and total cholesterol, LDL cholesterol, VLDL cholesterol and triglyceride levels. The effect may be more predominant when consumed for longer period of time.

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