



## Research Article

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### EFFECTS OF *ECLIPTA ALBA* AND DIABETIC DIET WITH LIFE STYLE MODIFICATIONS ON BLOOD GLUCOSE LEVELS IN DIABETIC PATIENT

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#### ABSTRACT

Diabetes is going to be most dreadful life style disorder as it is spreading to most of the countries. If not controlled/managed, leads to energy starvation and deleterious effects on multiple organs like kidney, heart, eyes or nerves and 50% of the diabetic people show such complications at some later stages of chronic metabolic disorder. People are managing diabetes by different available therapies but some are also controlling by dietary life style modification. This study to compare the effectiveness of the *Eclipta alba* as well as the dietary life style modification against the diabetes.

**Keywords:** *Eclipta alba*, Antihyperglycemic, Dietary life style modification, Blood glucose.

#### INTRODUCTION

A dreadful life style disorder known as diabetes is spreading to most of the countries<sup>1</sup>. If not controlled/managed, leads to energy starvation and deleterious effects on multiple organs like kidney, heart, eyes or nerves and 50% of the diabetic people show such complications at some later stages of chronic metabolic disorder<sup>2-3</sup>. The basic treatment approach is to manage the disease is by using oral anti-diabetic drugs; insulin administration; nutritional dietary aid, diet management and scheduled exercise. WHO reports (1997) showed that between 20%-50% of people with diabetes can control their blood glucose levels by dietary modification alone<sup>4</sup>. Previous studies have shown the close link between diabetes and dietary life style. Unhealthy lifestyles (lack of physical activity and excessive eating), initiate and propagate the majority of diabetes<sup>5-6</sup>. Lifestyle modification is also playing an important role in diabetes management. Patients with diabetes, because of their universal need for insulin, must learn to count or at least closely estimate the amount of carbohydrate they consume to help regulate their blood glucose levels and adjust their insulin doses. Failure to do so can lead to dangerous hyperglycemia or hypoglycemia.

It's a virtue of plants help the mankind since the origin of life in evolution. Plants are our wealth in many ways, mainly in health by containing the constituents helpful in treatment of the diseases<sup>7</sup>. Diabetes can also be treated by such plants. *Eclipta alba* is known as Bhringaraj<sup>8</sup>, posses potent anti-hyperglycemic activity<sup>9</sup>. In this study we tried to compare the effectiveness of the *Eclipta alba* as well as the dietary life style modification against the diabetes.

#### MATERIAL AND METHODS

The study was conducted in Department of Medicine & Department of Pharmacology, King George's Medical University, Lucknow, India. Study was started after taking ethical clearance from Institutional Ethical Committee Institutional Ethical clearance number: 47/IAEC/2013. Newly diagnosed subjects with type 2 diabetes were recruited from the OPD of the Medicine Department of King George's Medical University. The total duration of study was 11 months.

#### Subject Selection

Patients were included in the study after fulfilling inclusion criteria with age group 20-60 years, of either sex; Newly diagnosed diabetic; with fasting blood glucose range 120-135mg/dl and post prandial blood glucose range 160-210mg/dl; without chronic diseases like hypertension, CHF, epilepsy and psychiatric disorder. And exclusion criteria with age >60 & <20 years; Pregnant and lactating females; allergic to any ingredient of the drug; concomitant drugs like anti-epileptics, anti-psychotics, anti-hypertensive, anti-asthmatics, corticosteroids etc.; having Co-morbidities; uncooperative not ready to give written informed consent.

#### Study Design

Patients were randomly divided into two groups. Randomisation was done by computer generated program.

**Group 1:** Total 24 patients enrolled during start of the study. 18 patients completed the study while 6 patients were dropped in follow up (dropouts). *Eclipta Alba* extract was given in the form of capsule, administered orally in a dose of 800 mg three times a day (calculated

from previous studies), purchased from Fortune Herbal Care Pvt. Ltd. Ghaziabad.

**Group 2:** Total 24 patients enrolled during start of the study. 22 patients completed the study while 2 patients were dropped in follow up (dropouts). Patients were advised diabetic diet chart and life style modification only.

**Sample Collection and Serum Separation**

After overnight fasting, 1.5 ml of venous blood sample was collected from the patients on day 0 for baseline estimation of blood glucose. After collection of fasting blood samples patients were given 75 gms of oral glucose with 200 ml of water and patients were advised to take rest for 2 hours for collection of second blood sample. After 2 hours of glucose intake 2 ml of blood was collected for postprandial blood glucose estimation. After collection of blood samples as day 0 patient were given treatment. They were asked to come after 30 day, 60 day and 90 days for fasting and postprandial blood glucose level estimation.

**Biochemical Analysis**

The biochemical estimation of the samples was done in the Department of Pathology, King George’s Medical University, Lucknow, India.

**Estimation of Blood Glucose**

The Fasting blood glucose levels were estimated using a standard commercial Eco-Pak Glucose kit (Accurex Biomedical Pvt. Ltd.). It was based upon an enzymatic method using Glucose Oxidase and Peroxidase enzyme and a spectrophotometer.

**Statistical Analysis**

The results are presented in mean, SD and percentages. The paired t-test is being used to compare the changes in the lipid levels from baseline to follow-ups. The p-value <0.05 is being considered as significant. All the analysis is carried out by using SPSS 16.0 version.

**RESULTS**

The fasting blood glucose (FBG) levels were similar in all the groups at the baseline. There was significant (p<0.05) difference in the FBG levels between Group I (122.45±34.67) and Group II (127.31±7.63) at one month. Similar observations were found at two and three month (Table 1).

The post-prandial blood glucose (PPBG) levels were similar in all the groups at baseline. There was significant difference (p<0.05) in the PPBG levels between Group I (194.45±33.67) and Group II (194.68±38.43) at one month. Similar observations were found at two and three month (Table 1).

**Table 1: Blood Glucose Levels in Patients**

Follow-ups	Blood Glucose Levels			
	Fasting		Post-prandial	
	Group I (Mean±SD) (n=18)	Group II (Mean±SD) (n=22)	Group I (Mean±SD) (n=18)	Group II (Mean±SD) (n=22)
Baseline	126.95±36.91	129.95±6.84	205.20±46.50	200.63±38.60
One month	122.45±34.67**	127.31±7.63*, **	194.45±33.67**	194.68±38.43*, **
Two month	119.89±28.78**	124.54±8.56*, **	179.19±30.77**	187.25±33.35*, **
Three month	109.78±30.78**	119.37±35.67*, **	149.18±31.48**	183.27±25.67*, **

\*p<0.01, \*\*p<0.05

There was 3.2% decrease in fasting blood glucose from baseline to one month in Group I which was 2% in Group II. The decrease was statistically significant in both groups (p<0.05, p<0.01). A significant decrease from baseline to two and three month was found in both groups (Table 2).

There was 5.5±1.2 % decrease in post-prandial blood glucose level from baseline to one month in Group I, which was 3.0±2.0 % in Group II. The decrease was statistically significant in both groups (p<0.05). A significant decrease from baseline to two and three month was found in Group I and II (Table 2).

**Table 2: Average percent decrease in blood glucose level from baseline to follow-ups**

Blood Glucose	Treatment groups	Baseline vs One month (Mean±SD)	Baseline vs two month (Mean±SD)	Baseline vs three month (Mean±SD)
Fasting	Group I	3.2±2.4*	5.6±1.4*	13.9±5.14**
	Group II	2.0±1.67*	4.2±2.8*	8.4±7.6*
Post-prandial	Group I	5.5±1.2*	12.5±6.2**	25.6±7.2**
	Group II	3.0±2.0*	6.7±4.3*	8.7±1.5*

\*p<0.05, \*\*p<0.01

## DISCUSSION

The Present study has been conducted to evaluate the anti-hyperglycaemic effect of an indigenous plant *Eclipta alba* on diabetes mellitus patients. The effects of this preparation were compared with that of diabetic diet and life style modification group. Study was approved by institutional ethics committee K.G.M.U., Lucknow. Patients fulfilling the proposed inclusion/exclusion criteria were enrolled in study after their written informed consent.

After selection and allocation to groups, demographic profile and clinical variables were recorded on the case record form. There were no statistically significant differences in demographic variables of patients belonging to both groups.

In comparison to other groups, there is significant difference between test drug group and diabetic diet and life style modification. The percentage reduction in fasting blood glucose levels of patients treated with *Eclipta alba* v/s patients on diabetic diet and life style modification only at day 30, day 60, and day 90.

At day 30: 3.2±2.4 % in Group I and 2.0±1.67 in Group II, Significant difference (p<0.05).

At day 60: 5.6±1.4% in Group I and 4.2±2.8% in Group II, Significant difference (p<0.05).

At day 90: 13.9±5.14 % in Group I and 8.4±7.6% in Group II, Significant difference (p<0.05).

In comparison to groups, there was significant difference between test drug group and diabetic diet and life style modification only group. The percentage reduction in post prandial blood glucose levels of patients treated with *Eclipta alba* v/s patients on diabetic diet and life style modification only at day 30, day 60, and day 90.

At day 30: 5.5±1.2 % in Group I and 3.0±2.0% in Group II, Significant difference (p<0.01).

At day 60: 12.5±6.2% in Group I and 6.7±4.3% in Group II, Significant difference (p<0.01).

At day 90: 25.6±7.2 % in Group I and 8.7±1.5% in Group II, Significant difference (p<0.01).

So anti-hyperglycemic action of *Eclipta alba* is significant. These results are consistent with studies done before<sup>9</sup>. *Eclipta alba*, a commonly used plant in treatment of various ailments by ayurvedic and unani practitioners. The pharmacological effect of this endogenous plant has been shown due to presence of multiple active pharmacological principles. These phyto-chemicals are numerous but the important phytochemicals related to the present study are as Coumestans (wedelolactone & demethylwedelolactone)<sup>10</sup>, Terpenoids and their glycosides, Alkaloids<sup>11</sup>, Volatile oils, Saponins, Tannins, lignin<sup>12</sup>. Possible mechanisms for anti-hyperglycemic action of *Eclipta alba* based on previous studies are due to decrease intestinal absorption of glucose by  $\alpha$  glucosidase inhibitory activity due to phytochemical, wedelolactone, demethylwedelolactone<sup>13</sup>, eclalbasaponin VI present in *eclipta alba*<sup>14</sup>; Insulin secretagogue activity – volatile oil; Initiating release of insulin – tannin<sup>15</sup>; Insulin sensitizing

activity – saponin, tannin, lignin<sup>15</sup>; Flavonoids suppress blood glucose level<sup>16-20</sup>.

## CONCLUSION

The proposed study was to compare the importance of the herbal drug *Eclipta alba* and dietary life style modification. No doubt, both the factors are important in treatment of diabetes, but the here the *Eclipta alba* showing the better results against the disease diabetes. Further studies are warranted to use both the therapies at a time for better results.

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