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## **Effect of *Eclipta Alba* against blood glucose level in diabetic patients**

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### **Abstract**

In this modern age, people are moving towards nature to treat the diseases to avoid the side effects of the allopathic drugs. Diabetes Mellitus is one such important disease, constitutently increasing prevalence globally and is one of the most challenging health problems in the 21<sup>st</sup> century. The Present study has been conducted to evaluate the antihyperglycaemic effect of an indigenous plant *Eclipta alba* against the diabetes mellitus on patients.

**Keywords:** *Eclipta alba*, Diabetes, Antihyperglycemic, Blood glucose

### **1.Introduction**

With the advancement of science and technology, man has developed successful treatment for many diseases. These developments on the other hand led to the adoption of unhealthy life styles and development of important diseases having high incidence of morbidity and mortality. Diabetes Mellitus [DM] is one such important disease.

DM with constitutently increasing prevalence globally and is one of the most challenging health problems in the 21<sup>st</sup> century[1]. India leads the global top ten in terms of the highest number of people with diabetes, with a figure of 50.8 million for 2010. If preventive measures are not taken, number of expected diabetes will increase to 438 million by 2030[2].

DM is a metabolic disorder characterized by hyperglycaemia, glycosuria, hyperlipidemia, negative nitrogen balance, polyuria, polydipsia, and polyphagia. It also leads to emaciation, and weakness due to disturbance in carbohydrate, fat, and protein metabolism associated with absolute or relative deficiency in insulin secretion and/ or insulin action[3].

The disease is growing fastest in developing countries where there are more people in the lower

and middle-income group. Patient education, understanding, and participation are vital since the complications of diabetes are far less common and less severe in people who have well-managed blood sugar levels[3]. Other concomitant health problems may accelerate the deleterious effects of diabetes. These include smoking, elevated cholesterol levels, obesity, high blood pressure, and lack of regular exercise [4].

Although there is an increase in the prevalence of type-1 diabetes also, the major driver of the epidemic is the more common form of diabetes, namely type-2 diabetes, which accounts for more than 90 percent of all diabetes cases. Nowhere is the diabetes epidemic more pronounced than in India as shown by World Health Organization (WHO)[4]. Recently there has been an increasing realization that prolonged use of oral hypoglycaemic drugs elicits various side effects and that of insulin leads to resistance. Therefore searching for a new class of compounds is essential to overcome diabetic problems [5].

Management of diabetes without any side effect is still a challenge to the medical community. Therefore it is prudent to look for options in herbal

medicines for diabetes as well. In traditional practice medicinal plants are used in many countries to control diabetes mellitus. The hypoglycemic action of these medicinal plants is being studied. Plant drugs are frequently considered to be less toxic and safe than synthetic ones. Extracts of various plant materials capable of decreasing blood sugar have been tested in experimental animal models and their effects are confirmed [6].

*Eclipta alba* (Bhringraj) the plant of family compositae is such medicinal plant, popularly used for inflammation, as antihelminthic, astringent, deobstruent[7]. So far as *eclipta alba*, the test drug of present study, is concerned, it is mainly used as a remedy for hepatic-dysfunction [8-9], hair-diseases (premature greying, baldness etc.)[10], anemia etc. *Eclipta alba* has shown to alter blood glucose levels in different animal experimental models. However its role as a hypoglycaemic, hypolipidaemic and hypotensive agent is yet to be established in clinical settings. Therefore present study has been planned to see the effect of *Eclipta alba* in treatment of diabetes mellitus.

## 2. Material and Methods

The study was conducted in Department of Medicine & Department of Pharmacology, King George's Medical University, Lucknow. Study was started after taking ethical clearance from Institutional Ethical Committee. 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.

### 2.1 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 antiepileptics, antipsychotics, antihypertensive, antiasthmatics, corticosteroids etc.; having Co-morbidities; Uncooperative not ready to give written informed consent.

### 2.2 Study Design

Total 24 patients enrolled during start of the study. 18 patients completed the study while 6 patients were lost 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.

### 2.3 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 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.

### 2.4 Biochemical analysis

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

### 2.5 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.

### 2.6 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.

## 3. Results

The fasting blood glucose (FBG) levels as well as the post-prandial blood glucose (PPBG) levels were about similar in all patients at the baseline (Table-1).

There was 2% decrease in fasting blood glucose from baseline to one month. The decrease was statistically significant ( $p<0.05$ ,  $p<0.01$ ). A significant decrease from baseline to two and three month was found in all the patients. There was  $5.5\pm1.2\%$  decrease in post-prandial blood glucose level from baseline to one month. A significant decrease from baseline to two and three month was found (Table-2).

**Table-1: Blood glucose levels in patients**

Follow-up	blood glucose levels in Patients (Mean±SD) (n=18)	
	Fasting	Post-prandial
Baseline	126.95±36.91	205.20±46.50
One month	122.45±34.67**	194.45±33.67**
Two month	119.89±28.78**	179.19±30.77**
Three month	109.78±30.78**	149.18±31.48**

\*p&lt;0.01, \*\*p&lt;0.05 (Significant)

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

Blood glucose level	Baseline Vs One month (Mean±SD)	Baseline Vs two month (Mean±SD)	Baseline Vs three month (Mean±SD)
Fasting	3.2±2.4*	5.6±1.4*	13.9±5.14**
Post-prandial	5.5±1.2*	12.5±6.2**	25.6±7.2**

\*p&lt;0.05, \*\*p&lt;0.01

#### 4. Discussion

The Present study has been conducted to evaluate the antihyperglycaemic effect of an indigenous plant *Eclipta alba* on diabetes mellitus patients. *Eclipta Alba* showed significant decrease in mean FBG levels 3.2±2.4 % reduction, significant (p<0.05); 5.6±1.4% reduction, significant (p<0.01) and 13.9±5.14 % reduction, significant (p<0.001) at day 30, day 60 and day 90 after treatment when compared with that of day 0 [Table-2]. *Eclipta alba* showed significant decrease in mean post prandial blood glucose levels 5.5±1.2% reduction, significant (p<0.05); 12.5±6.2% reduction, significant (p<0.01) and 25.6±7.2 % reduction, significant (p<0.01) at day 30, day 60 and day 90 after treatment [Table-2].

*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 phytochemicals are numerous but the important phytochemicals related to the present study are as Coumestans (wedelolactone & demethylwedelolactone)[11], Terpenoids and their glycosides, Alkaloids[12], Volatile oils[13], Saponins, Tannins, lignin[14]. Possible mechanisms for antihyperglycemic 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[15], eclalbasaponin VI present in *eclipta alba*[16]; Insulin secretagogue activity – volatile oil; Initiating release of insulin – tannin; Insulin sensitizing activity – saponin, tannin, lignin[17]. Flavonoids suppress blood glucose

level[18]. Flavonoid, apigenin, increased glucose uptake in soleus muscle acting through insulin signaling pathways[19].

#### 5. Conclusion

Present study concluded about the importance of the *Eclipta alba* in diabetic patients by reducing blood glucose level. So it is need to conduct more studies to explore its action not even against diabetes but also against other diseases.

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