

Effect of Oral *Nigella Sativa* on Fasting Blood Glucose in Adults

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**Abstract**

**Introduction:** *Nigella Sativa* is widely used traditional medicinal plant throughout the world as seeds and oil. It has been used to treat a wide range of disorders including Diabetes Mellitus (DM).

**Objective:** Effect of oral *Nigella Sativa* on fasting blood glucose in non-diabetic individuals.

**Methods:** A cross sectional study was conducted on 10 healthy non diabetic volunteers aged 20-35 years with normal fasting blood glucose (FBG). Subjects were given *Nigella Sativa* seeds orally (4gm) twice per day for 2 days. FBG was measured before and after *Nigella Sativa* supplementation by glucose oxidase methods using bio system A25.

**Results:** The level of the fasting blood glucose was  $99.4 \pm 3.1$  mg/dl in the first day and decreased to  $93.1 \pm 4.6$  mg/dl after *Nigella Sativa* administration, which was statistically significant ( $p$ . value= 0.031).

**Conclusion:** *Nigella Sativa* significantly reduced the level of blood glucose among non-diabetics adults. The mechanism of action of *Nigella sativa* needs to be investigated.

**Keywords:** *Nigella Sativa* FBG

**Introduction**

The use of herbal drugs as complementary medicine is prevalent worldwide and is gaining popularity. *Nigella sativa* (NS) is a widely used medicinal plant throughout the world with a long history of use of the raw seeds as well as oil in medicines and food. *N. sativa* is an herbaceous plant growing to about 20–30 cm in height, commonly known as black seeds because of the small triangular black seeds it generates. The plant is also known as the Blessed Seed in Arab culture. It has been consumed for more than 2000 years, is used extensively in the traditional medicine of many southern Mediterranean and Middle Eastern countries, and has been shown to produce multisystem beneficial actions, including hypocholesterolemic, antioxidant, antidiabetic and anti-inflammatory effects [1].

The hypoglycemic and antidiabetic effect of *N. sativa* has been reported by numerous scientific studies. It has been demonstrated that *N. sativa* seed ethanol extract (NSE) exhibits the remarkable ability to concomitantly increase insulin secretion, induce proliferation of pancreatic  $\beta$  cells, and stimulate glucose uptake in skeletal muscles and fat cells [1, 2].

This study is a pilot one on normal subjects to confirm the hypoglycemic effect of NS and then to search for the active ingredient producing this effect and by which mechanism it is producing its effects in the short and long term treatment.

**Methods**

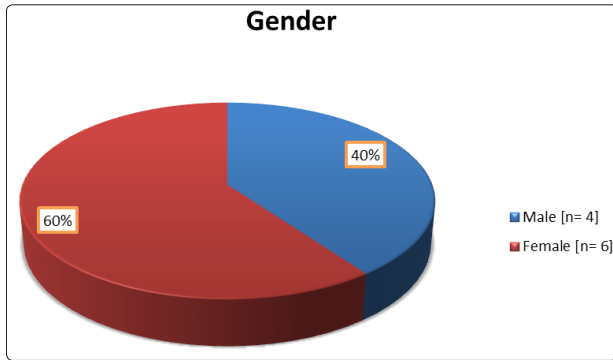
A cross sectional study was conducted on 10 adult Sudanese volunteers in Khartoum state Sudan (6 females and 4 males), aged 20-35 years, with a FBG  $\geq 100$  mg/dl and clinically fit. Subjects were treated with *Nigella Sativa* (4gm) twice per day for 2 days. FBG was measured before and after *Nigella Sativa* supplementation [3-10].

Three ml of venous blood was withdrawn for fasting blood glucose (FBG) measurement after an overnight fasting (8 hours) with exception of water. FBG was estimated by glucose oxidase method using Bio systems A25 automated clinical chemistry analyzer according to the manufacturer's instructions.

Data was analyzed by using statistical Package for Social Studies (SPSS v. 21.0, IBM; Chicago). Paired t-Test was used to compare FBG before and after NS administration. P value was considered as significant at the level  $\leq 0.05$ .

## Results

A total of 10 normal Sudanese individuals, 6(60%) were females and 4(40%) were males (figure 1), their age ranged from 20-35 years with a mean of 26.7±4.6 years.

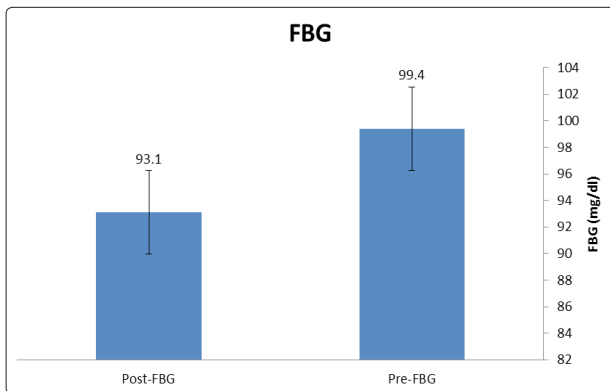


**Figure 1:** The gender distribution of the study (N= 10)

The level of fasting blood glucose (FBG) was 99.4±3.1 mg/dl before taking NS and was significantly reduced after *Nigella Sativa* administration to 93.1±4.6 mg/dl (P. value 0.031) (table 2).

**Table 1:** The levels of fasting blood glucose (FBG) before and after *Nigella Sativa* administration (N=10)

	N	Mean.mg/dl	SD
Pre-FBG	10	99.4	3.1
Post-FBG	10	93.1	4.6
P. value= 0.031*			



**Figure 2:** The levels of fasting blood glucose (FBG) before and after *Nigella Sativa* administration (N=10)

## Discussion

*N. sativa* has many beneficiary effects such as an anticancer, anti-inflammatory, cardiovascular, renal, immunomodulatory, and antidiabetic effects as well as many other effects like antiasthmatic, antimicrobial, antiparasitic, and antihypertensive effects. Moreover, the seeds of *N. sativa* are widely used in the treatment of various diseases like bronchitis, diarrhea, rheumatism, and skin disorders. The efficacy of *N. sativa* is related to numerous active components which have been isolated from seeds and its oil including thymoquinone, thymohydroquinone, dithymoquinone, thymol, carvacrol, nigellimine-N-oxide, nigellidine, and alpha-hederin, as well as flavonoids [11-16].

However, administration of 20% (w/w) methanol extract of either *N. sativa* to STZ-induced diabetic rats significantly reduced hyperglycemic and oxidative stress resulting from hyperglycemia. Also, they improved all adverse biochemical and histopathological changes resulting from diabetes. These natural resources revealed safe and excellent antidiabetic activity attributed to their antioxidant activity. As well as overcoming most of the histopathology changes in kidney and pancreas tissues, the majority of the cells restored the normal conditions [17-28]. Therefore, it is recommended that dietary *N. sativa* could be excellent adjuvant support in the therapy of diabetes mellitus and preventing its complications [3].

Our study demonstrated that the NS has significantly reduced the levels of FBG which is consistent with Bamosa AO who found that NS seeds 1, 2 and 3 g/day significantly improved glycemic control [29]. Also it is compatible with Salama R.H.M who studied hypoglycemic effect of NS in type 2 diabetic rats. In this present study we investigated the hypoglycemic effect of N.S in NON diabetic individuals and the study confirmed that NS has a role in lowering blood glucose [30]. The role of N.S in glucose absorption in the gut and enhancing secretion of insulin from pancreatic beta cells or acting at tissue levels needs further investigations.

In conclusion supplementation of NIGELLA SATIVA decreases glucose level and play a role in homeostatic mechanism of glycemic control.

## Recommendation

More studies have to be conducted with a larger sample and extra protocols to find the mechanism of action of NS and to find out the active ingredient.

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