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The effect of *Nigella sativa* on type 1 diabetic patients in Nile River state

Malak E. Ahmed[*1], Hassan S. Mohammed [2], Nahid M. Hassan[3], Omer A. Musa[4]

[1]*Faculty of Medicine, Nile Valley University, Atbara, Sudan*
[2]*Atbara Hospital, Ministry of Health, Atbara, Sudan*
[3]*Department of Maxillofacial and Diagnostic Science, College of Dentistry, Jazan University, Jazan, Saudi Arabia*
[4]*Faculty of Medicine, National Ribat University, Khartoum, Sudan*

Abstract

Nigella sativa (NS) is a widely used medicinal plant throughout the world. Seeds and oil have a long history of folklore usage in various aspects of medicines and food. It has is used to treat a wide range of diseases including diabetes mellitus (DM). DM is a chronic incurable disease with high mortality and morbidity and increasing prevalence. The aim of this study was to investigate hypoglycemic effect (NS) in type 1 diabetic patients. 30 Patients with type I diabetes were included in the study. They were given NS (2gm per day) beside their regular treatment (insulin) without change in their dose and diet for 30 days. At the end of the study fasting blood glucose (FBG) was checked and data was analyzed using *t*-test and paired *t*-test in Statistical Package for the Social Sciences (SPSS).22 software. The mean levels of FBS before, and one month after the intervention were 259 ± 102, 134 ± 70 respectively. There was significant reduction in FBS before and after treatment (P =0.000). Results showed a significant improvement in FBG in type 1 diabetic patient used NS for30 days beside their regular treatment and diet. More studies are recommended in the future to determine the optimal dose, duration and frequency of NS as an antidiabetic drug well as to study effect of NS in prevention of diabetic complication.
Keywords: *Nigella sativa*, Type 1 diabetic patients and hypoglycemic effect.

***Correspondence Info:**
Dr. Malak E. Ahmed
Faculty of Medicine,
Nile Valley University,
Atbara, Sudan

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1. Introduction

Nigella sativa NS that belongs to the family Ranunculaceae has many medicixcnal properties [1] like; antidiabetic [2-10], anticancer [11-13], analgesic, anti-inflammatory [14-16], immunomodulator [17,18], anti-asthmatic [19], cardiovascular protective [20], gastro-protective [21], hepato-protective [22] and renal protective [23,24] effects. It also has antibacterial [25], antifungal [26], anti-schistosomiasis [27], antioxidant [28], neuro-pharmacolgical [29] and anticonvulsant activities [30]. The most important active compound of this plant is thymoquinone [12-13]. Many studies proved safety of these plants [31]. Previous study in Sudanese in Kartoum state showed that, both N. *sativa* and bee honey seem to have some benefits to asthmatics with no hepato-renal toxicity [32]. Other studies indicates that NS oil has is a potential drug in the treating DM as well as improving of insulin signaling pathway [33].

Diabetes mellitus is a chronic disorder of glucose metabolism results from dysfunction of pancreatic beta cells, insulin resistance or both. It is a serious global health problem the prevalence of which has been rising more rapidly in middle- and low-income countries [34].

The disease prevails in both genders and all age groups, so there is concern among the general public about its control and treatment [35]. In 2015, diabetes was the direct cause of 1.6 million deaths, WHO estimates that diabetes will be the seventh leading cause of death in 2030. Uncontrolled diabetes leads to serious damage to

many of the body's systems, especially the nerves and blood vessels [34]. It can be divided primarily into two types: type I or insulin dependent diabetes mellitus and type II or non-insulin dependent diabetes mellitus [36]. Type I diabetes mellitus is an autoimmune disease characterized by local inflammatory reaction in and around islets that is followed by selective destruction of insulin secreting β-cell and it occurs mainly in childhood [35]. Symptoms of DM include polyuria, polydipsia, constant hunger, weight loss, vision changes, and fatigue. These symptoms may occur suddenly [34].

Objectives: The objective of this study was to investigate safety and hypoglycemic effect of NS on type 1 diabetics.

2. Method

Our study was a clinical trial conducted on 30 diabetic children (14 males and 16 female). The inclusion criteria were patients referred to pediatric clinic in Atbara hospital, Atbara, River Nile state, Sudan, age 5-17. Patients were treated with NS (2gm per day) beside their regular treatment (insulin) for 30 days. FBG was measured before and after one month.

5ml of blood was collected by laboratory technician to detect fasting blood glucose (FBG) after overnight fasting (8 hours) with exception of water and medication. FBG was estimated by glucose oxidase method using Bio systems A25 automated clinical chemistry analyzer according to manufacturer's instructions.

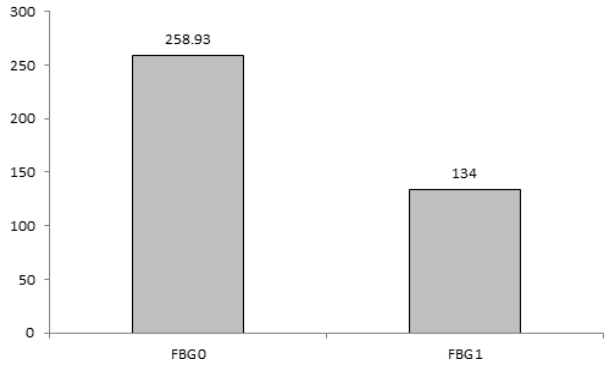
3. Result

Data was analyzed using t-test and paired t-test in Statistical Package for the Social Sciences (SPSS).22 software. The mean of FBS before, and one month after use of NS were 259 ± 102, 134 ± 70 respectively (Table 1, Figure 1), There was a significant reduction in FBG (P =0.000).

Table 1: Fasting blood glucose before and after treatment

Variable	Before treatment	After treatment	P value
Fasting blood glucose	259 ± 102	134± 70	0.000

Figure 1: Fasting blood glucose before and after treatment



4. Discussion

Our result is consistent with Bamosa AO 2010 who found that NS seeds 1, 2 and 3 g/day significantly improved glycemic control with no toxicity [9]. Also it is compatible with Salama *et al* who studied hypoglycemic effect of NS in type 2 diabetic rats [2]. In this present study we investigated the hypoglycemic effect of N.S in the diabetic patients Type I on regular insulin treatment. Our study confirmed the oral hypoglycemic action of NS in Type I diabetic patients.

Recommendation

More studies are to be conducted for longer time to investigate impact of N.S on diabetic complications and larger groups to determine the optimal dose.

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