

Role Of Nigella Sativa Seeds In Treatment of Polycystic Ovary Syndrome (PCOS)

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Abstract

A hyperandrogenic condition called polycystic ovarian syndrome (PCOS) is connected to persistent oligo-anovulation. Asians are less likely to develop hirsutism due to PCOS. 5% to 10% of this age group was impacted by those between the ages of 18 and 44. Therefore, there is a greater demand for PCOS research and awareness. To decrease the cost, length and side effects of current treatment, polyhedral formulations must be developed based on the aforementioned variables.

The current study sought to determine the combined impact of honey and a hydro-alcoholic extract of Nigella sativa on triglycerides (TG), total cholesterol (HDL-C and low density lipoprotein cholesterol (LDL-C), glucose, and insulin in a Wistar rat model of PCOS. Materials and procedures 72 adult Wistar rats weighing 200-220g were placed into 9 groups (n=8) at random; 6 experimental PCOS groups, control (intact) groups. Letrozole was administered to rats for 21 days in an effort to cause PCOS. For a period of 28 days in an effort to cause PCOS. For a period of 28 days, PCOS rats were administered two doses of honey (1200 and 2400mg/k), two doses of a combination of the two substances. Lipid glucose and insulin were evaluated using the ELISA technique after blood serum was collected. For the analysis, SPSS software version 16 was used. Results: In all experimental groups, a serological examination revealed decreased levels of TG, TC, LDL glucose, and insulin. When Nigella sativa and honey were combined at dose 2, glucose and insulin, levels reduced (p 0.05) in comparison to the PCOS group. In dose 2 of the combination of N. sativa extract and honey groups, HDL level increased. Conclusion: Combination of Nigella sativa extract and honey improves lipid and the sensitivity to insulin in patients with PCOS. Further studies and investigations are recommended to find the appropriate mechanism of N. sativa and its different derivatives.

Keywords

Nigella sativa, honey, hydroalcoholic extract, insulin, PCOS

Introduction

PCOS is a disorder causing enlarged ovaries with small cysts on the outer edge. It is one of the common endocrine disorders among women. The main cause of PCOS is still unknown. There's evidence that genetics play a role in it. The cause can be attributed to defects in the hypothalamic pituitary function and insulin action. In this study, we have investigated the effects of nigella sativa which is also called as black cumin in the treatment of PCOS [1]. The plant seeds have antifungal and antimicrobial properties and also show effect as menstrual regulations and milk booster. A tincture prepared from plant seeds are useful in indigestion, loss of appetite, diarrhea, dropsy, and amenorrhea and also in treatment of worms and skin eruption. In Arabic approbation it is referred as 'Habbatul barakah' means the seed of blessing [2,3]. The compound like Thymoquinone, *t*-anethole, carbacrol, and 4-terpinol isolated from N. sativa. It has detectable free radical scavenging, antioxidant and anti-inflammatory properties. For use in PCOS the thymoquinone isolated from nigella sativa in the form of black cumin oil 500 mg capsule with combination of metformin 500 mg three times daily for six months shows significant decrease in the amenorrhea or oligomenorrhea. Combination of nigella sativa extract and honey improves lipid profile and the sensitivity to insulin in patients with PCOS [4]. Another investigation into the beneficial effects of N. sativa on mastalgia and dysmenorrhea in Iran has

also been done . The duration of menstruation, and the interval between menstruation, and the amount of metabolic components in blood significantly improved after 4 months in the Naeimi et al. pilot investigation about the effect of *N. sativa* on oligomenorrhea, amenorrhea, and the other parameters of PCOS [20]. There are no reports of *N. sativa* adverse effects that are life threatening from the perspective of ITM and contemporary medicine. Therefore, the purpose of this study was to evaluate *N. sativa* ability to treat PCOS patients oligomenorrhea and amenorrhoea [20].



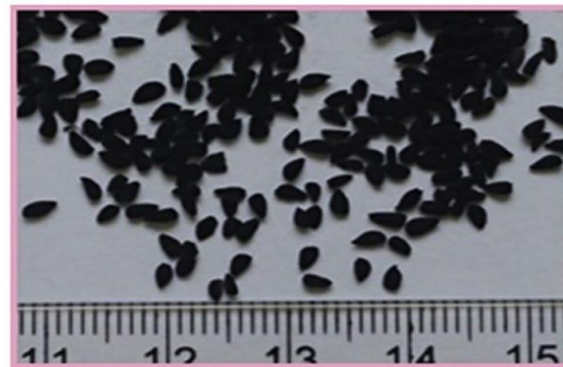
Nigella sativa flower



Nigella sativa plant



Nigella sativa powder



Nigella sativa seeds

NATURAL MATERIAL

NAME- *Nigella sativa*

SYNONYMS- black seed, black caraway, Roman coriander, kalonji

GEOGRAPHICAL SOURCE– it is native to southern Europe, north Africa and southwest Asia.

It is cultivated in India, Pakistan, Syria, Turkey, Saudi Arabia, middle eastern Mediterranean region and south Europe

CONSTITUENTS- thymoquinone, dithymoquinone, carvacrol, dihydrocarvone.

USES- antifungal, antimicrobial, indigestion, loss of appetite, diarrhea, dropsy, amenorrhea and dysmenorrhea and in the treatment of worms and skin eruptions

ANIMALS: All studies were carried out in line with nationally authorized rules for the use of animals in research. By the regional ethical committee at Kazeroon Islamic Azad university a total of 72 adult Wistar rats weighing 200g to 220g were purchased from the Kazeroon campus of the Islamic Azad university. All rats were kept in cages that were 22 degree C warm and exposed to 12 hours of light and darkness. The rodents were given unlimited access to food and water.

Experimental Design

Vaginal smears were used to track estrous cyclicity. During the twelve to fourteen days of the vaginal smear; rats were in the estrous phase of their reproductive cycle and experimental two to three normal estrous cycles [5]. In this work, letrozole (Aburayhan Co, Iran) was utilized to hormonally induce PCOS. Phenotype letrozole was dissolved in 0.5% carboxymethyl-cellulose (CMC) and used to produce

PCOS this time period saw the microscopical evaluation of the estrus cycle through investigation of leukocyte, epithelial, and cornified cell proportions [6]. Iranian Guilan provinces Boz Kouye Hamlet is where the natural honey was purchased. In Shiraz in the Iranian province of Fars, a local herbal store sold the *N. sativa* seeds [7]. Doses were made (300 mg/kg and 2400 mg/kg, respectively) the following 72 female rats were divided into 9 groups (n=8): control, sham, PCOS and 6 experimental PCOS groups. Rats were given letrozole at a concentration of 1.0. Following confirmation that the condition had been developed, PCOS rats were split into 7 groups: a control group (group 1) and 6 experimental groups (n=8 each). The experimental groups included group 2, which gave rats oral doses of 1200 mg/kg honey, group 4, which gave them oral doses of 300 mg/kg *N. sativa* extract, group 6, which gave them oral doses of a combination of 300 mg/kg *N. sativa* extract and 1200 mg/kg honey [8].

Statistic Analysis

The findings are displayed as mean SD with the use of the SPSS computer, the data was analysed using either the student's t-test to compare two means or the analysis of variance (ANOVA) and Tukey's test to handle multiple comparisons. $p < 0.05$ was regarded as the cutoff for significance.

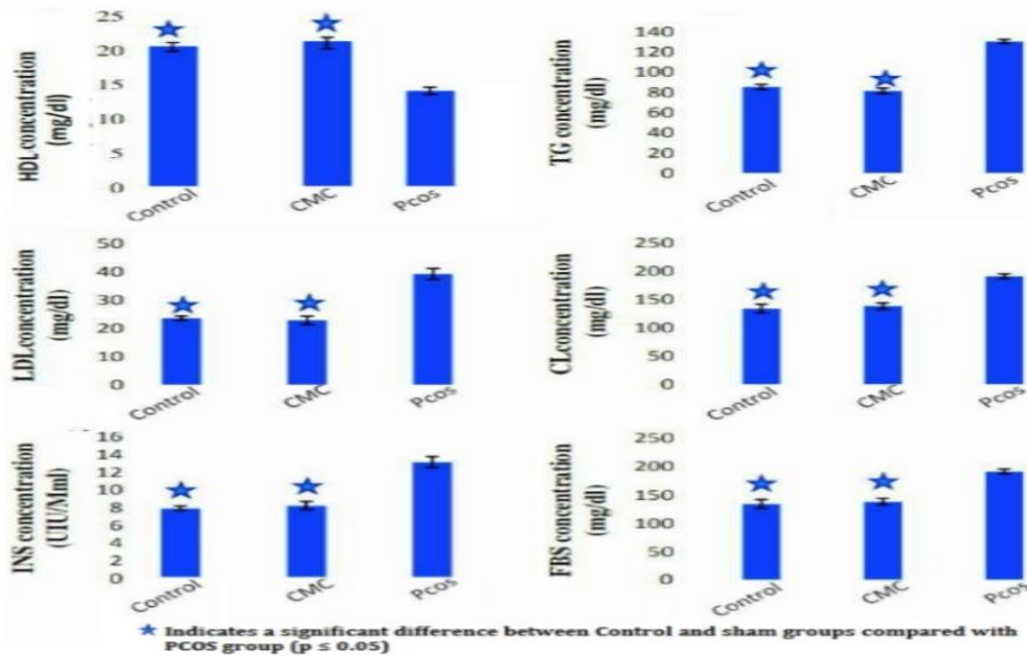
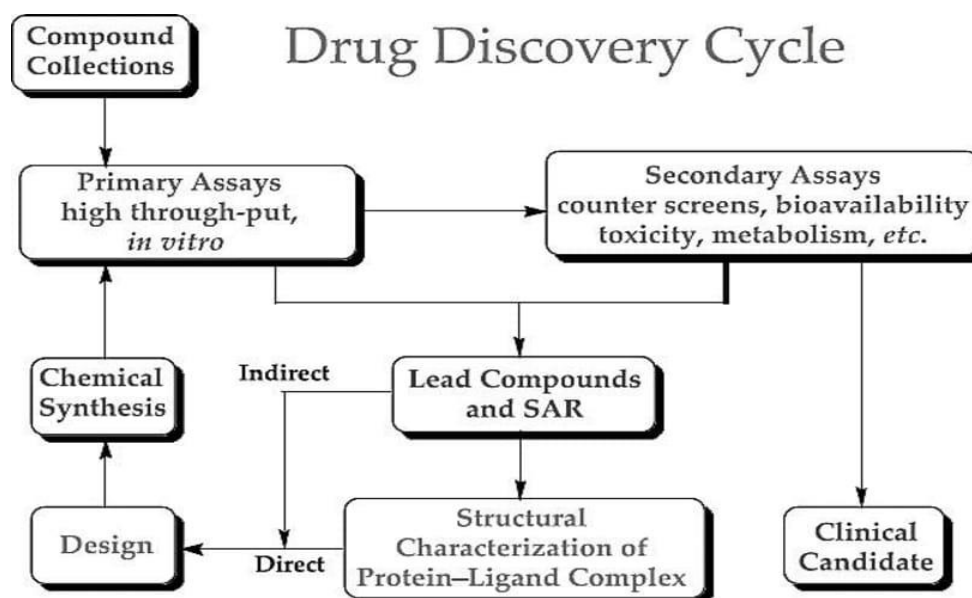


Figure 1: The average levels of triglyceride, cholesterol, LDL, HDL, insulin and FBS in control, sham and PCOS groups

Result

According to the study findings, the PCOS group had different lipid profile, insulin and FBS (fasting blood sugar) levels than the control groups. When compared to the control and standard groups, the levels of cholesterol, insulin, and FBS in the PCOS groups significantly increased ($p < 0.05$), whereas the level of HDL cholesterol significantly decreased ($p < 0.05$) (figure 1). This study looked at how *Nigella sativa* hydroalcoholic extract and honey affected polycystic ovarian syndrome patients' lipid profiles and IR indices (insulin and glucose). Wistar rats were used as a model to study syndrome. After letrozole caused PCOS, our examination of serum lipids revealed a significant rise ($p < 0.05$) in the levels of TC, TG, LDL-C, insulin and glucose. Additionally, HDL-C level significantly decreased ($p < 0.05$) when PCOS was induced. In all experimental groups, serological examination revealed decreased levels of TG, TC, LDL, FBS, and insulin, particularly at dose 2 of the combination of *N. sativa* extract and honey (600 mg/kg *N. sativa* extract and 2400 mg/kg honey). TG, TC, LDL, glucose and insulin level in the experimental group significantly decreased ($p < 0.05$) in comparison with baseline. Letrozole was used in this investigation to induce polycystic ovarian syndrome, and the effects on

the lipid profile, insulin levels, and glucose were comparable. Additionally, as a sign of PCOS, IR-induced hyperandrogenism. Therefore compared to the control groups, PCOS patients have higher levels of atherogenic lipids. The outcomes showed that the PCOS group given the highest dosage of the alcoholic extract of *N. sativa* seed and honey had significantly lower serum concentrations of TC, TG, LDL, insulin and glucose. Additionally, in PCOS rats fed with a minimal dose of an alcoholic extract of *N. sativa* seed and honey, TG levels were significantly lowered. A significant rise was seen in the PCOS group treated with doses 1, 2, of the *n. sativa* extract and Honey.

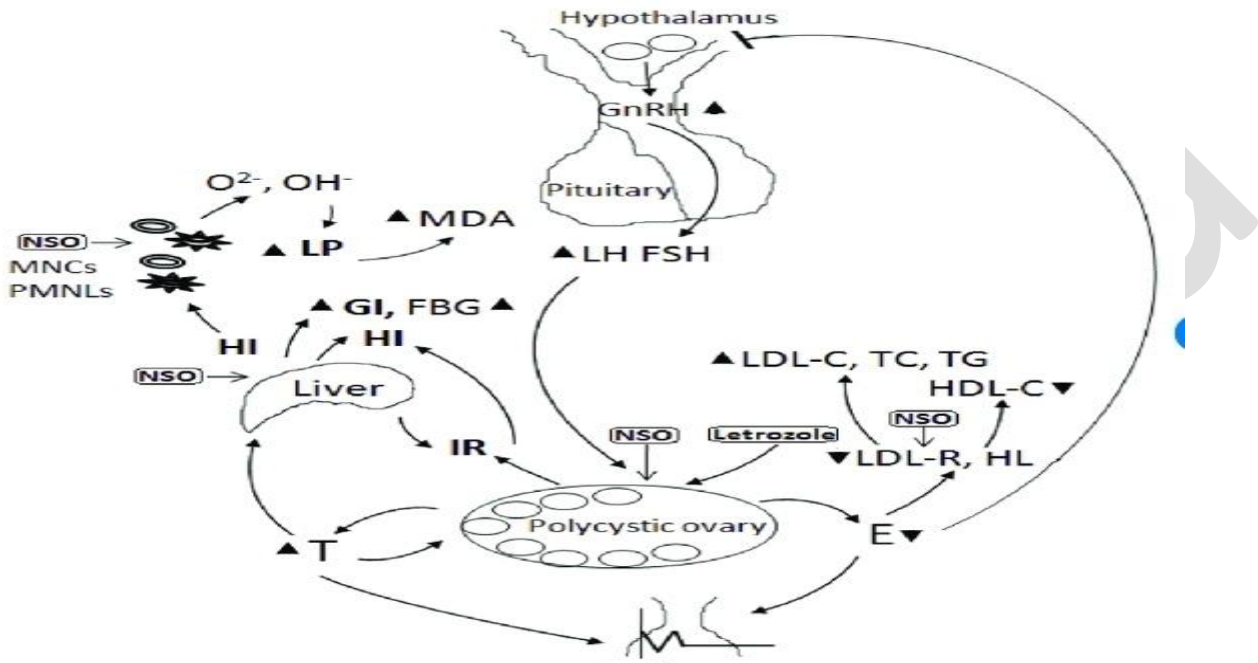


Discussion

Numerous illnesses are treated with *N. sativa* which is regarded as a miracle herb with a fascinating historical and theological history. Thymol, thymoquinone, and dithymoquinone are among the compounds in *N. SATIVA* that have impact on blood lipid levels. In hyperlipidemic rabbits, Pourghassemetal study found that giving them 7.5 grammes of *N. sativa* daily along with a 0.5%cholesterol diet for two months reduced total cholesterol, triglyceride and LDL levels significantly [10]. The rat blood lipid profile is improved by *N. sativa* extract, which also increases the antioxidant defence system,lowers blood glucose levels in diabetic rabbits, and stops lipid oxidation in mice with hepatotoxicity brought on by carbon tetrachloride. Thymoquinone treatment in diabetes rats resulted in a significant drop in blood cholesterol and triglyceride level according to Fararhetal. *N. sativa* controls cholesterol synthesis as well as the expression of the ApoA1 and Apo B-100 genes [11]. It may also lowers by decreasing the activity of the acetyl CoA carboxylase(ACC) enzyme, liver fatty acid synthesis can be decreased, which would ultimately reduce insulin resistance[12]. *N. sativa* soluble mucilage concentration reduces cholesterol absorption, diet, and bile acid synthesis, which increases cholesterol excretion. In conventional medicines, honey is also crucial [9]. It is capable of preventing a wide range of illness, including cancer, cardiovascular diseases, inflammation neurodegenerative problems and ageing [13]. It alsohas excellent antioxidant properties because of the activity of its constituents, such as phenol,peptide,organicacids,enzymes, and other substances, honey has antioxidant properties[14].

Proposed mechanism of action of *N. sativa* in PCOS: Nigella sativa oil interferes with letrozole-induced hyperandrogenemia to reduce circulating levels of testosterone(T) and increases circulating levels of estrogen (E) by alleviating letrozole-mediated inhibited of aromatase enzyme in the ovary. "Honey is very useful to treat physical disease, the Qur'an is an effective medicine,"the prophet Muhammad (peace be upon him) once said.it is advised to utilize them because they are described in the book for mindful disorders[15]. Honey consumption of 75 grammes daily for 15 days

significantly reduced cholesterol levels[16]. In a study by Yaghoobi et al on 55 patients, the effects of honey on fasting blood glucose, total cholesterol, weight, LDL, HDL, and c-reactive protein (CRP) were assessed. It was found that 70 g of honey for 30 days would lower LDL, triglycerides, and cholesterol in overweight patients. HDL levels increased after long periods of time [17]. In another study by Adan et al., the effect of honey on hyperlipidemic dietary rats were assessed and their anti-hyperlipidemic capabilities confirmed in a study by Adnan et al. that is in honey, niacin [18] It stops the breakdown of adipose tissue and lowers plasma triglycerides and liver triglyceride production [18].



Conclusion

According to the study finding, combining Nigella Sativa extract and honey can lower cholesterol levels and improve insulin sensitivity in PCOS patients, lowering their chance of developing complications like metabolic syndrome. Future studies on the effects of Nigella sativa extract and honey on hormonal parameters, morphological and morphometric alterations in the ovaries and uterus in PCOS are recommended by the authors.

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