

Effect of *Nigella sativa* and bee's honey on cardiopulmonary functions in patients with persistent asthma

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Abstract

Background: *Nigella sativa* (NS) (black seed) and Bee's honey (BH) are relatively cheap and safe natural products with anti-inflammatory and antiallergic properties. They are used traditionally in the treatment of so many diseases. **Objective:** The objective was to investigate the adjuvant effect of combined use of NS and BH with the inhaled corticosteroids (ICS) on respiratory rate (RR), pulse rate (PR), blood pressure (BP), oxygen saturation (SPO₂), and wheezing symptom in patients with moderate and severe persistent asthma. **Materials and Methods:** An oral dose of NS (2 mg once daily) and BH (7.5 ml twice a day) was given for 3 months. Proper chest examination, the vital signs (RR, PR, and BP) and standard measurement of SPO₂ were performed initially (baseline) and at the end of the 3rd month. **Results:** Totally, 30 asthmatic patients were included (14 females and 16 males), aged 16–50 years with a mean age of 43.91 ± 5.8. By the end of the 3rd month: The RR, PR, systolic BP, and diastolic BP were significantly decreased ($P < 0.05$); SPO₂ was increased, and wheezing was significantly reduced in both asthma categories. **Conclusion:** Combination of NS and BH as an adjuvant therapy with ICS was found to improve the cardiopulmonary functions and helps better control of asthma symptoms.

Key words: Asthma, Bee's honey, blood pressure, *Nigella sativa*, pulse rate, respiratory rate, oxygen saturation

INTRODUCTION


Asthma is a serious public health problem throughout the world, when uncontrolled, asthmatic not only trouble symptoms, but also limitation of daily activities whether occupational, social or physical, sleep impairment, and emotional problems, and is sometimes fatal.

It is a complex, chronic syndrome of the airways that is characterized by variable, recurring, paroxysmal or

persistent symptoms of airways (shortness of breath, chest tightness, wheeze, and cough), due to airflow obstruction.^[1]

Hyperventilation is a characteristic feature of acute asthma due to airway narrowing greater effort must be made to maintain normal gas values. Accessory muscles of respiration are called to action favoring more inspiration than expiration. This result in hyperinflation of the chest and prolongation of expiration together with constricted bronchus and partially occluded bronchioles by tenacious exudates.^[2] The air moving through constricted airways produces a musical sound of high-pitched whistling character (wheeze).

In spite that, all asthmatics share common signs, and symptoms, clinicians have recognized the great heterogeneity in the severity of airway obstruction, degree of response to medications^[3] that is up to 30–45% of asthmatics fail to have improvement in lung function

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with high doses of inhaled corticosteroids (ICS), the gold-standard anti-inflammatory therapy.^[4,5] There is also variation in the triggers causing episodes such as allergen exposure, exercise, psychological stress, drug administration such as aspirin and β blockers, the frequency and long-term outcomes like irreversible loss of lung function due to airway remodeling; Permanent structural changes that render the patient less responsive to therapy.^[6]

Asthma prevention has not been achieved with allergen reduction strategies^[7] or allergen-specific immunotherapy^[8] despite its proven efficacy in allergic rhinitis,^[9] once asthma is established, there is no cure and there are currently no medications that can alter the natural history of the disease.

Medications to treat asthma can be classified as controllers or relievers therapies.

Controllers are medications taken daily on a long-term basis to keep asthma under clinical control chiefly through their anti-inflammatory effects. They include inhaled, and systemic corticosteroids sustained release theophylline, cromones, and anti-IgE. Inhaled corticosteroids are the most effective controller medications currently available. However, ICS are relatively expensive particularly in the developing countries.

Relievers are medications that act quickly to reverse bronchoconstriction, they include short-acting inhaled β -agonists, inhaled anticholinergics, and short-acting theophylline.^[10]

Bee's honey (BH) and Nigella sativa (NS) known as the black seed are pioneers in medicinal plants. They are relatively cheap, safe, and have many therapeutic properties which explain their use for curing so many diseases for many centuries. Many studies including experimental ones on BH have shown that it is antitussive in children^[11] antiseptic, antimicrobial,^[12] antipyretic, antiinflammatory, antiallergic, sedative, laxative antioxidant,^[13] and has a wound healing effect^[14-16] It promotes rehydration, stimulates immunity,

helps fertility, aids digestion, reduce cholesterol and is beneficial for all types of skin diseases^[17] it is cited by the World Health Organization as a potential treatment.^[18]

Nigella sativa has been extensively studied for its biological activities and shown to possess a wide spectrum of activities, diuretic, antihypertensive, antidiarrheal, appetite stimulant.^[19] Antibacterial^[20] antihistaminic,^[21] support immune system, analgesics, and anti-inflammatory.^[22,23]

MATERIALS AND METHODS

The study included 30 Sudanese patients clinically diagnosed as persistent asthma on ICS. 13 patients (44.3%) had severe persistent and 17 patients (56.7%) had moderate persistent asthma. An oral dose of NS (2 mg once daily) and BH (7.5 ml twice a day) was given for 3 months. For every patient, proper chest examination was performed by inspection, palpation, percussion, and auscultation using ordinary stethoscope. The pulse rate (PR) was determined by counting the pulse for a whole minute. Blood pressure (BP) was measured by the auscultatory method using mercury type sphygmomanometer. Oxygen saturation (SPO₂) was measured by a standard pulse oximeter. The probe of the oximeter was placed across the thumb finger, and the percent hemoglobin saturation with oxygen digitally displayed on the screen.

RESULTS

Totally, 30 asthmatic patients were included (14 females and 16 males), aged 16–50 years with a mean age of 43.91 ± 5.8 . There was statistically significant decrease in respiratory rate, systolic BP and diastolic BP, PR increase in moderate asthma patients. SPO₂ increased but not statistical significant [Table 1]. Wheezing symptom was significantly reduced by the end of the 3rd month in both asthma categories [Figure 1].

Table 1: Clinical findings in patients with severe and moderate persistent asthma done before and after 3 months usage of Bee's honey and Nigella sativa

Clinical finding	Asthma class			
	Severe asthma		Moderate asthma	
	Before starting treatment	After 3 months	Before starting treatment	After 3 months
RR	24.30 ^a (± 6.00)	17.60 ^d (± 1.84)	20.60 ^b (± 5.66)	18.80 ^c (± 3.29)
PR	90.20 ^b (± 11.38)	89.00 ^c (± 10.68)	86.90 ^d (± 14.99)	92.50 ^a (± 14.37)
SBP	130.00 ^a (± 9.43)	118.00 ^c (± 13.17)	122.00 ^b (± 12.29)	115.00 ^d (± 11.79)
DBP	83.00 ^e (± 11.60)	74.00 ^g (± 6.99)	79.00 ^f (± 7.38)	74.00 ^g (± 6.99)
SpO ₂	97.70 ^a (± 1.83)	98.90 ^a (± 0.88)	98.00 ^a (± 1.83)	98.80 ^a (± 0.79)

Values are mean \pm SD any two mean values bearing different superscripts in rows are significantly different ($P < 0.05$) according to DM. SD: Standard deviation, RR: Respiratory rate, PR: Pulse rate, SBP: Systolic blood pressure, DBP: Diastolic blood pressure, SpO₂: Oxygen saturation, DM: Diabetes mellitus, ^{a,b,c,d,e,f,g}: $P < 0.05$

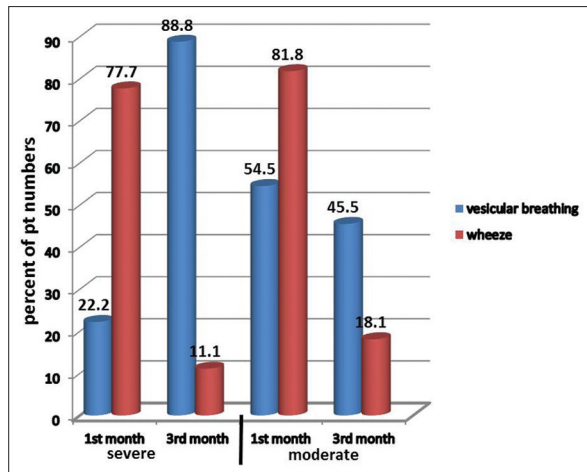


Figure 1: Finding of auscultation in severe and moderate asthma patients done before and after three months of Bee's honey and Nigella sativa usage

DISCUSSION

As it was well-known currently ICS are the most effective anti-inflammatory medications for the treatment of persistent asthma and studies have demonstrated their efficacy in reducing asthma symptoms. Nevertheless, some patients with refractory asthma continue to have persistent symptoms despite high doses of inhaled or oral corticosteroids; other patients continue to exhibit marked airway hyperresponsiveness.^[24]

In the present study, the concomitant use of NS and BH as an adjuvant therapy with ICS has shown marked improvement in the main asthma symptom (wheezing) as well as the cardiopulmonary functions. These results are supported by a previous study conducted by Boskabady *et al.* who examined the bronchodilator effect of the boiled extract of NS on the airways of asthmatic patients in comparison with theophylline. Their results documented a significant increase in all measured lung function tests including forced expiratory volume in 1 s, peak expiratory flow rate and maximum mid expiratory flow and onset of the bronchodilator effect of Nigella extract was found similar to theophylline.^[25]

The possible explanation for the impressive improvement in lung function of the asthmatic patients in our study is the special characteristics of BH and NS, which include immunomodulatory,^[26] anti-inflammatory and antiallergic effects.^[27] The presence of different types of inflammatory processes may need potentiation by the synergistic effects of the NS and BH on the anti-inflammatory effect of the ICS.

CONCLUSION

Combination of NS and BH as an adjuvant therapy with ICS was found to improve the cardiopulmonary functions and help better control of asthma symptoms.

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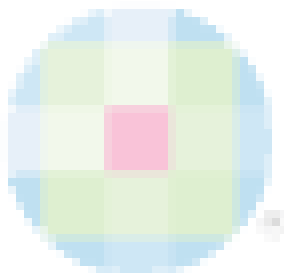
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