

Original Research Article

Effect of combination of *Nigella sativa* and Bee's honey on lung function, respiratory muscle power, and asthma control in patients with persistent asthma

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Received: 02 November 2016

Accepted: 01 December 2016

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ABSTRACT

Background: Persistent asthma is a serious global medical problem, usually controlled by long term use of inhaled corticosteroids (ICS). However, ICS are expensive particularly in the developing countries and despite their use, a proportion of patients still suffer from uncontrolled symptoms and may progress into intractable airflow limitation. *Nigella sativa* and Bee's honey are relatively cheap and safe natural products with anti-inflammatory and anti-allergic properties; they are used traditionally in treatment of so many diseases.

Methods: In this study, we investigated the adjuvant effect of combination of *Nigella Sativa* and Bee's honey on lung function, respiratory muscle power and asthma control in patients with persistent asthma. An oral dose of *Nigella sativa* (2 mg once daily), and bee's honey (7.5 ml twice a day) were given to patients with uncontrolled persistent asthma (n=30, 14 females and 16 males with mean age of 43.91±5.8) for three months duration. Lung function tests (FEV1, FVC and PEFr) and respiratory muscle power indicators (MEP, MIP) were measured initially as baseline records and monthly for 3 months. The baseline score for asthma control test (ACT) was calculated for all patients and repeated after three months.

Results: There was statistically significant improvement in lung function and respiratory muscle power. The need for asthma relieving β_2 agonists was remarkably decreased and a significant improvement in asthma control test score in both asthma groups was observed.

Conclusions: Combination of *Nigella sativa* and Bee's Honey as an adjuvant therapy with ICS decreases asthma severity grade and hence the need for both asthma controlling and relieving drugs and improves patient's quality of life.

Keywords: Asthma, Asthma control test, Bee's honey, *Nigella sativa*, Pulmonary function test, Respiratory muscle power

INTRODUCTION

Asthma is a chronic disease of the respiratory airways characterized by variable, recurring paroxysmal or persistent symptoms of shortness of breath, chest tightness, wheeze, and cough, resulting in airflow

obstruction.¹ Although all asthmatics share common signs and symptoms, clinicians have recognized a great heterogeneity in the severity of airway obstruction and the degree of response to medications. There are also variations in the frequency and long term outcomes such as irreversible loss of lung function due to airway

remodeling which render the patient less responsive to therapy.^{2,3} Medications used to treat asthma are classified into controllers and relievers. Controllers are medications taken daily on a long term basis to keep asthma under clinical control through their anti-inflammatory effect. Inhaled corticosteroids (ICS) are the most effective controller medications currently available.

However, ICS are relatively expensive particularly in the developing countries and it is reported that up to 25-35% of asthmatics may not improve lung function with ICS.⁴ Although severe exacerbations are more common with poorly controlled asthma, they also occur in patients with mild asthma.⁵⁻⁶ Asthmatics life quality is assessed by asthma control test, a global measure of the impact of asthma from the patient's perspective; a good control means no night and day symptoms, little or no use of reliever medication, physically active lives, near normal lung function and no serious attacks.⁷

Nigella sativa (N. sativa) and Bee's Honey (BH) are relatively cheap and safe natural products and have been traditionally used to cure human diseases since ancient times. N. sativa is commonly known as black seed and it is regarded as "a valuable remedy for a number of diseases" in Unani Tibb system of medicine.⁸

The medicinal uses and health properties of BH have been documented by many experimental and in vivo studies. BH relieves nocturnal cough in children, has an antimicrobial activity, wound healing promoting effect, immunomodulatory and anti-oxidant properties.⁹⁻¹³ N. sativa belongs to the family Ranunculaceae with many medicinal properties which include: anti-allergic, a bronchodilator, reduces tracheal responsiveness, and immunomodulation.¹⁴⁻¹⁸

In this context, we investigated the adjuvant effect of combination of *Nigella Sativa* and Bee's honey on lung function, respiratory muscle power and asthma control in patients with persistent asthma.

METHODS

The study included 30 Sudanese patients randomly selected from asthma referred clinics in Khartoum State, Sudan. Patients were clinically diagnosed as uncontrolled persistent asthma on ICS. Thirteen patients (44.3%) had severe persistent and 17 patients (56.7%) had moderate persistent asthma. *Nigella sativa* seeds were purchased from Khartoum local market in the capital of Sudan and pure BH from Blue Nile state in southern Sudan, and then the doses were prepared for every subject.

An oral dose of *Nigella sativa* (2 mg once daily), and bee's honey (7.5 ml twice a day) were added for three months. Lung function tests (FEV1, FVC and PEFR) were measured by digital Spirometer (Microplus spirometer) according to ATS/ERS standardized methods.¹⁹ And the respiratory muscle power indicators (MEP, MIP) were measured by respiratory pressure meter (MicroRPM). Measurements were taken initially as baseline records and monthly for 3 months. The baseline score for asthma control test (ACT) was calculated for all patients and repeated after three months. The study protocol was approved by the research ethics committee of the National Ribat University and an informed consent was obtained from all subjects under the study.

RESULTS

Thirty asthmatic patients were included (14 females and 16 males), aged 16-50 years with mean age of 43.91± 5.8. There was statistically significant improvement in lung function and respiratory muscle power tests (p <0.05 for all parameters) and the improved values were more obvious in patients with severe persistent asthma, (Table 1). Moreover, a significant improvement in asthma control test score in both asthma groups was observed and slightly more evident in patients with persistent asthma (p<0.001), (Table 1). The need for asthma relieving β₂ agonists was remarkably decreased (from 3 to 1 puff) in both asthma categories.

Table 1: Results of pulmonary function, respiratory muscle power tests and asthma control test (ACT) score before (baseline) and after the adjuvant treatment.

Parameter	Asthma severity grade					
	Severe persistent			Moderate persistent		
	Mean±SD (baseline)	Mean±SD After 3 month	p value	Mean ± SD (baseline)	Mean ± SD After 3 month	p value
FEV1(L)	1.74±0.35	2.33±0.44	0.03	1.67±0.72	2.00±0.73	0.046
PEFR (L/min)	273±73.04	363±37.43	<0.001	248±93.07	307±107.61	<0.001
FVC(L)	2.39±0.62	2.94±0.44	0.04	2.37±0.99	2.91±1.00	0.042
MIP (cm/H2O)	65.5±14.72	90.5±13.94	<0.001	73±29.31	96.10±26.38	0.0019
MEP(cm/H2O)	78.6±24.15	101.2±22.54	<0.001	89.80±33.89	117.1±26.61	<0.001
ACT score	12.5±3.75	23.80±1.62	<0.001	13.10±2.18	24.30±0.95	<0.001

DISCUSSION

The study has shown promising and novel results in the treatment of persistent asthma. There was significant improvement in pulmonary function test (PFT) parameters particularly that assessing airway resistance (FEV1 and PEFr). These results are consistent with a previous human study by Boskabady MH et al who examined the effect of NS boiled extract on asthma symptoms and PFT values in the study group which were significantly improved.²⁰ Nevertheless, the improvement in pulmonary function test parameters shown in our study conforms to the previous positive preliminary human study results by Nahid et al on Sudanese asthmatic patients.²¹

The impressive improvement in PFT and the maximum inspiratory and expiratory pressures (MIP&MEP) is possibly explained by the medicinal characteristics of Bee's Honey.⁹⁻¹³ Nevertheless, presence of different types of inflammatory processes needs potentiation by the synergistic anti-inflammatory, bronchodilator, antitussive and other medicinal properties of *Nigella Sativa*.¹⁴⁻¹⁸

Moreover, the present study revealed an obvious reduction in the use of rapid reliever, rescue inhalers (almost to less than half) together with a highly significant improvement in asthma control test score ; results consistent with the global strategy for asthma management and control.²²

Because of the high cost of inhaled corticosteroids (ICS) as long term medications for patients with persistent asthma particularly in developing countries in addition to the reported failure of improvement in at least 25% of patients, using combination of *N. Sativa* and BH together with ICS will help control asthma with a lower cost and a better outcome which comply with the recent support of the World Health Organization (WHO) for countries to integrate traditional medicine with their national health care systems.^{4,23}

CONCLUSION

In conclusion, combination of *Nigella sativa* and Bee's Honey as an adjuvant therapy with ICS decreases asthma severity grade and hence the need for both asthma controlling and relieving drugs and improves patient's quality of life.

ACKNOWLEDGEMENTS

Authors would like to thank National Ribat University in Sudan for funding this research project.

Funding: National Ribat University, Khartoum, Sudan

Conflict of interest: None declared

Ethical approval: The study was approved by the Institutional Ethics Committee

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Cite this article as: Abdelrahman JE, Magzoub AA, Ibrahim RE, Elnoor MA, Musa OA. Effect of combination of *Nigella sativa* and Bee's honey on lung function, respiratory muscle power, and asthma control in patients with persistent asthma. Int J Res Med Sci 2017;5:236-9.