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Nigella sativa powder for helicobacter pylori infected patients: a randomized, double-blinded, placebo-controlled clinical trial

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Abstract

Objective This double-blind, placebo-controlled, clinical trial was conducted to define the effects of Nigella sativa (*N. Sativa*) powder plus conventional medical treatment of *Helicobacter pylori* (*H. pylori*) on serum ghrelin level and appetite in *H. pylori*-infected patients.

Methods In the present study, 51 *H. pylori*-positive patients were randomly allocated to treatment (n = 26) or placebo (n = 25) groups. They received 2 g/day *N. Sativa* with quadruple therapy or 2 g/day placebo plus quadruple therapy for 8 weeks. The serum level of ghrelin was assessed before and after the intervention. Appetite was evaluated at the onset and at the end of the intervention.

Results At the end of the study, the appetite of the treatment group improved significantly compared with the placebo group (P = 0.02). Statistically, the difference in serum ghrelin levels between the study's groups was insignificant (P > 0.05).

Conclusion Supplementation with *N. Sativa* powder may be a beneficial adjunctive therapy in *H. pylori*-infected patients.

Trial registration This study was registered in the Iranian Registry of Clinical Trials (IRCT20170916036204N7) on 08/08/2018.

Keywords *Nigella sativa*, *Helicobacter pylori*, Appetite, Ghrelin, Integrative medicine, Herbal medicine

Introduction

Each microbe needs to be able to best exploit the host environment and protect itself from deleterious factors. This is especially the case for a gram-negative microaerophilic bacterium that is named *Helicobacter pylori* (*H. pylori)* [1]. *H. pylori* penetrates the gastric mucus layer and secretes some virulence factors such as lipopolysaccharides (LPS), cytotoxin-associated gene A (cagA), and vacuolating cytotoxin A (vacA) into the host cells' cytoplasm and eventually leads to inflammation and harm to the gastric epithelial cells [2]. *H. pylori* infection is implicated in gastritis, dyspepsia, peptic ulcer, and gastric cancer [1]. Worldwide, 50.8% of the people in developing

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gastritis caused by *H. pylori*, duration of the infection, the strain of *H. pylori*, hormonal factors, nutritional changes, etc. may affect the ghrelin level [5, 6, 27].

H. pylori secretes some deleterious pathogenic agents into the epithelial cells of the stomach, thereby leading to the malfunctioning of gastric pyloric and oxyntic glands. As a result, the expression of the hormones involved in regulating satiety, hunger, and food consumption such as ghrelin is disrupted [31, 32]. Thus, it can cause loss of appetite and weight in the individuals infected with this infection [32].

Ghrelin is an appetite-stimulating peptide with 28-amino acid primarily produced in the oxyntic gland of the stomach. This neuroendocrine hormone has a well-established part in the regulation of energy homeostasis, fat storage, increasing appetite, food intake [4], and provoking gastric emptying and acid secretion [33]. The effects of ghrelin on stimulating appetite, food consumption, and body weight have been evaluated in several human and animal studies. For instance, in a clinical trial, intravenous ghrelin infusion (5 pmol/kg/in) stimulated the appetite and food intake 30% more than saline infusion [34]. Similarly, ghrelin agonist treatment significantly improves gastric emptying and weight gain in women with anorexia nervosa after four weeks of the intervention [35]. Also, Nakazato et al. in their study indicated that intravenous infusion of anti-ghrelin antibodies led to significant weight loss in rats [36].

As we reported in our previous article, 8 weeks' consumption of 2 gr/day *N. Sativa* powder along with quadruple treatment could significantly rise the *H. pylori* infection eradication in the intervention group compared to the control group [25]. Therefore, the increase of serum ghrelin concentration in the treatment group and the decrease in the control group can be justified by the higher *H. pylori* eradication level in the treatment group in the present study.

In our study, the patient's appetite improved significantly in the treatment group compared to the placebo after the intervention. Similarly, in the study of Jeong Jang et al. after the eradication of *H.pylori*, the visual analog scales for hunger and prospective food intake were significantly increased [4]. Although the increase in serum ghrelin concentration of the treatment group was not statistically significant in our study, it seems that it was clinically significant and had a positive effect on the patient's appetite.

On the other hand, there is a strong association between *H. pylori* infection and functional dyspepsia (FD). FD is a common gastrointestinal disorder characterized by early satiation, postprandial fullness, epigastric pain or burning, bloating, nausea, and vomiting with no evidence of organic disease. Although the pathophysiology is not well established, impaired gastric emptying, gastroduodenal motility disorders, visceral hypersensitivity, and psychological abnormality may have a role in the pathogenesis of FD [37]. Since ghrelin affects gastric emptying, secretion, and motility, it may perform a role in the pathophysiology of FD. In other words, the functional disorders in FD may probably disturb the production of ghrelin by the stomach and lead to anorexia and weight loss in some patients [33]. In our previous article, we showed that supplementation with 2 gr/day *N. Sativa* powder along with quadruple treatment led to improve dyspepsia symptoms and increased intakes of energy, macronutrients, and most of the micronutrients. Also, BMI and body weight increased in the *N. Sativa* group in the course of intervention [25]. Thus, the improvement of dyspepsia symptoms may be another good reason for the improvement of appetite.

Limitations

The small sample size and the short duration of the patient's follow-up were the limitations of the current study. Measuring more regulatory hormones related to satiety, hunger, and food intake such as leptin, obestatin, and also gastric ghrelin mRNA expression is recommended together with long-term interventions with more sample size in upcoming studies. Moreover, the number of studies that evaluate the patients' appetite after *H. pylori* eradication is limited and according to our knowledge, the current study is the only clinical trial that evaluated the effect of *N. Sativa* supplementation on appetite in *H. pylori*-infected patients. Therefore, further studies should be considered on this issue.

Conclusion

This study demonstrated that consumption of 2 gr/day *N. Sativa* powder concurrent with quadruple treatment could improve appetite and elevate the serum ghrelin concentration in *H. pylori*-infected patients. Thus, supplementation with *N. Sativa* powder may be a beneficial adjunctive therapy in these patients.

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Authors' Contribution

N.H. conceived and supervised the study. H.Y. and M. A.N. collected the data. H.Y and F.M. wrote the manuscript. All the authors critically revised the manuscript. All the authors read and approved the final manuscript.

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Data Availability

The datasets used and analyzed during the current study are available from the corresponding author upon reasonable request.