

Hypolipidemic and Antioxidant Effects of Fenugreek-Nigella Sativa Combination on Diabetic Patients in Iraq

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ABSTRACT

Background: Dyslipidemia, an established risk factor for coronary heart diseases (CHD), is the most common complication in patients with type 2 diabetes mellitus (T2DM), many hypoglycemic drugs were used in the management of diabetes, because of their cost and many side effects, an alternative herbal therapeutic agent are required, from these plants fenugreek (*Trigonella foenumgraecum* L) and *Nigella sativa* (NS), that found to have hypolipidemic effects in the management of type 2 diabetes mellitus and its serious complications. This study investigates the effect of fenugreek and *Nigella sativa* seeds mixture for controlling hyperglycemia, dyslipidemia and antioxidant effect in type 2 diabetic patients.

Method: A Total of 80 patients (45 males and 35 females) with type 2 DM were recruited in this study, they were divided into two groups: study group (n=40) given 2 g of NS seeds powder and 20 g of fenugreek seeds powder a day for 8 weeks and Control group (n=40), which received the usual treatment protocol, diet, exercise and oral hypoglycemic drugs. The blood sample was collected from each participant before and after study. Investigations include fasting blood glucose, lipid profile test and MDA.

Result: After 2 months of treatment with fenugreek-*Nigella sativa* in the study group, there was a significant difference in the total cholesterol (195.03±8.7 vs. 247.4±9.5), low-density lipoprotein (97.8±7.96 vs. 157.36± 6.8), Triglyceride (192±6.9 vs. 261.8±5.5) as

compared with baseline values. Although the study group showed a significant elevation in HDL, as compared with the control group (p < 0.05) (40.85±6.16 vs. 37.15±3.18), this elevation was not significant as compared to the baseline value (40.85±6.16 vs. 39.93±5.44). MDA in the study group showed significant reduction as compared with its baseline value (1.64±0.8 vs. 2.3±0.5) but this change was nonsignificant as compared with the control group, between groups (1.64±0.8 vs. 1.52±0.30). Fasting blood glucose were not significantly different between the study and control groups.

Conclusion: The combination of fenugreek and *Nigella Sativa* herbs have the most powerful lipid lowering effect in diabetic patients by controlling blood glucose and its effect on dyslipidemia without side effects and also have greater antioxidant activity by reducing the MDA level in diabetic patients, so can be used as an alternative for management of type 2 diabetes.

Keywords: Pharmaceutical compounds; patients; MDA level; *Nigella sativa*

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INTRODUCTION

Diabetes Mellitus is a metabolic disease associated with chronic hyperglycemia, it is still one of the common causes of mortality, and fastest-growing disease worldwide [1,2]. The diabetes mellitus affected 346 million people in the world, according to the World health organization (WHO) report 2011, and its complications caused 3.4 million patients to be died in 2004. This estimated number is expected to be doubled in 2030 [3,4]. The DM. may be due to insulin deficiency that called type 1 diabetes, or due to deficiency of insulin secretion combined with resistance to insulin action, which is called type 2 diabetes, both types can cause serious complications over time such as nephropathy, neuropathy, retinopathy, dyslipidemia and cardiovascular diseases. Type 2 diabetes is more frequent, which represents 90-95 % of cases.

In the Dyslipidemia, type 2 diabetes is common, which characterized by hypercholesterolemia, hypertriglyceridemia, increased level of low density lipoprotein cholesterol (LDLc) and decrease levels of high density lipoprotein cholesterol (HDLc) In spite that the oral hypoglycemic drugs and insulin can control the complications appears early in diabetes, the late serious complications appear in many patients. Many side effects may usually accompanied the uses of these hypoglycemic drugs such as lactic acidosis, abdominal discomfort, severe hypoglycemia and peripheral edema. Therefore the studies should be continued for more effective and lesser side effects new antidiabetic drugs. Herbs and plants are new therapeutic agents that found to have hypolipidemic effects

in the treatment of type 2 diabetes and its complications From these plants fenugreek (*Trigonella foenumgraecum* L) and *Nigella sativa* (NS), several studies revealed that each one of these plants is effective in decrease plasma glucose and serum lipids in diabetes, and if they used in combination they may be more effective in improving the metabolic index [5]. The active components of *Nigella sativa* seeds having the great pharmacological properties, including, antidiabetic, antioxidant, anti-inflammatory, analgesic, antipyretic, antihypertensive, antiasthmatic, antimicrobial, antineoplastic [6]. The holistic medicinal property of *Nigella sativa* seed is due to its major bioactive component thymoquinone. Oxidative stress is lead to oxidative damage of cell which can measure by antioxidant status. Consequently, the natural antioxidants role and use in preventing oxidative stress occur in diabetes have great importance [7]. One of reactive electrophile species is Malondialdehyde (MDA), which is an aldehyde that form a covalent protein and cause toxic stress in cells. This aldehyde production represents a biomarker to evaluate the oxidative stress level in an organism [8].

The results of the effect of the fenugreek and *Nigella sativa* seeds mixture on hyperglycemia and dyslipidemia on type 2 diabetes were evaluated. The effect of the mixture was studied at MDA level.

MATERIALS AND METHODS

Study design

The study was conducted on 80 patients (45 males and 35 females) with type 2 DM. Patients in this study were