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Effect of using Boswellia serrata powder on blood glucose level and lipid profile of the patient with diabetes mellitus type II

Ali KahodomMohson[1], Rajha Abdul Hassan Hamza[2], Zainab Ali Al-Mubarak[3]
[1]Academic Nurse Faculty of Nursing, University of Kufa, Najaf, Iraq, E-Mail: alik.albuhassoon@student.uokufa.edu.iq
[2]**Professor,** Ph.D in Adult Nursing, Faculty of Nursing, University of Kufa, Najaf, Iraq
[3]**Professor,** Ph.D in Parasitology, Faculty of Nursing, University of Kufa, Najaf, Iraq
Corresponding author: Ali KahodomMohson, Email: alik.albuhassoon@student.uokufa.edu.iq

Abstract

Background: Diabetes Mellitus (DM) is one of the world's most common health conditions today**.** Can be treated with various oral hypoglycemic drugs.Natural medicines are becoming a popular form of healthcare worldwide. A large number of advantages are associated with antidiabetic herbal medicines as opposed to pharmaceutical drugs.BoswelliaSerrata is a promising conventional medicinal plant product that has many properties that make it an important subject for pharmaceutical science, low-density lipoprotein (LDL), blood glucose, and high-density lipoprotein (HDL) of patients with diabetes.**Methods:**60patients with type II diabetes patients of both sexes were allocated to the control group and two study groups (20 participants per group). Use Boswelliaserrata powder (1200 mg) daily for three months and it was given orally (three doses of 400 mg) in the study group that split into a group receiving metformin with Boswelliaserrata and a group receiving only Boswelliaserrata with a control group receiving metformin without Boswelliaserrata. At the start of the research, blood samples for (HBA1C) and there was no significant difference and after 12 weeks it was measured in patients with type II diabetes.**Results:** The use of Boswelliaserrata in diabetic patients resulted in a significant low in (HBA1C) levels of the study group compared to the control group **Conclusion:** This study found that taking. Boswelliaserrata supplements will help patients with type II diabetes control their blood sugar levels in a stable and balanced way. Thus, according to the results that have been shown, its use may be beneficial in patients taking metformin or without it.

Keywords: Boswelliaserrata, blood glucose level, diabetes mellitus type II

Introduction

Diabetes Mellitus (DM) is one of the world's most common medical conditions today. Insulin development by pancreatic cells is either deficient or missing, and target cells do not react to circulating insulin, resulting in hyperglycemia. (1). Type II Diabetes Mellitus can be treated with various oral hypoglycemic drugs. Currently available synthetic antidiabetic drugs are found to be associated with various major side effects and secondary complications (2). Patients who are unable to meet treatment targets for first-line oral hypoglycemic agents are often prescribed dual medication therapies. Despite the medicinal advantages, traditional dosage formulations have a low bioavailability and a brief half-life, necessitating repeated dosing and creating further side effects, resulting in therapy ineffectiveness and patient non-compliance (3). The rising expense of treating metabolic disorders may have a significant economic influence in many areas of the world, restricting patients' access to successful therapies (4,5). Boswelliaserrata is a potential conventional medicinal plant substance that is an intriguing target for pharmaceutical science since it has anti-inflammatory, antibacterial, antifungal, and antitumor properties (6). Nurses have a significant and crucial function in the care and education of diabetic patients. In recent years, with the rising prevalence of diabetes (especially type II) in every nation, their position has become more important. Health is an integral part of self-management therapy. To become self-sufficient, patients are normally taught simple meal preparation, carbohydrate measuring, and exchanges (7). Nurses have the greatest access to Complementary and Alternative Therapy Nurses can provide information about Complementary and Alternative Therapy to patients and families, lending support to patients' decisions. which indicates the need for the inclusion of

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Complementary and Alternative Therapy in nursing education (8). Madeleine Leininger's theory that supports the topic of the research is Transcultural Nursing Theory which talked about the importance of nursing and the culture of dealing with the patient from all aspects that lead to the provision of nursing care. One of these cultures is the culture of giving alternative treatment that does not lead to complications, on the contrary, it will lead to the recovery of the patient without side effects. identified her dedication to uncovering the epistemological origins of nursing information relating to cultural treatment, as well as its underlying definitions and characteristics (9). Therefore, this research deals to identify the effectiveness of these traditional materials in improving the condition of patients with type II DM. Hence the importance of the nurse action in providing nursing health care to type II diabetic patients through education on the use of safe nutritional supplements in the treatment of diabetes as they are safe on the body and have no side effects, as well as useful in reducing blood sugar and lipid levels.

Materials and methods

The current study was conducted in the Endocrinology and Diabetes Clinic at Al Manathira Hospital in Najaf Governorate after obtaining the approval of the Najaf Health Department. Official permission is also obtained from the Ministry of Planning / Central Statistical Council to accept the study tool, conduct the study, and apply the study intervention. The research is approved by the Medical Ethical Committee at the University of Kufa.

The Study Design

This study is a quasi-experimental design was carried out to determine the effect of Boswelliaserrata on the level of blood glucose andlipid profile in type II diabetes patients.

Sample of the Study

A non-probability purposive sampling of (participant 60) patients with type II diabetic, the selected patients were three different categories of equal numbers for each group (20 diabetic patients per group). The inclusion and exclusion criteria were taken into account for all participants, as they were classified as follows:

1. **Study group I:** Thefirst group includes patients with type II diabetics who were treated with the Boswelliaserrata plant with their treatment (Metformin).
2. **Study group II:** The second group includes patients with type II diabetics who were treated with Boswelliaserrata without any other treatment and who are dependent on their lifestyle.
3. **Control group:** The third group is the control group, patients who are not receiving the Boswelliaserrata and who are still receiving the classic intervention (metformin).

Statistical Analysis

The data from the research sample was entered and interpreted using the statistical kit for social sciences (SPSS) version 25. The analysis included the two types of statistics **Descriptive statistics** (mean, frequencies, and percentages. All continuous variables were tested for statistical normal distribution using bar charts and a normal distribution curve). **Inferential Statistics** A Chi-square test was used to compare frequencies. Bivariate Pearson’s correlation test.

Result

Table (1): Statistical distribution of patients by their Socio-Demographic Data for the study groups

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Items	Sub-groups	Group I		Group II		Control		Chi Square P value
		F.	%	F.	%	F.	%	
Age	31-39	1	5.0	1	5.0	4	20.0	5.55 0.23 NS
	40-48	9	45.0	6	30.0	9	45.0	
	49-57	10	50.0	13	65.0	7	35.0	
Gender	Male	10	50.0	13	65.0	14	70.0	1.83 0.39 NS
	Female	10	50.0	7	35.0	6	30.0	
Residence	Urban	11	55.0	9	45.0	7	35.0	1.62 0.44 NS
	Rural	9	45.0	11	55.0	13	65.0	
Daily Sport	Yes	0	0.0	1	5.0	0	0.0	2.03 0.36 NS
	No	20	100.0	19	95.0	20	100.0	
Patient eat 3 meals	Yes	12	60.0	15	75.0	11	55.0	4.31 0.65 NS
	No	8	40.0	5	25.0	9	45.0	
BMI	Normal	1	5.0	2	10.0	3	15.0	2.69 0.61 NS
	Overweight	12	60.0	13	65.0	9	45.0	
	Obese	7	35.0	5	25.0	8	40.0	
Total		**20**	**100%**	**20**	**100%**	**20**	**100%**	

NS : Non-significant at P value >0.05 ; HS : High Significant at P value <0.01 : BMI : Body Mass Index

Table (1) shows the statistical distribution of participants by their socio-demographic data for the three study groups. Regarding group, I (the sample group that uses Boswelliaserrata along with metformin), the highest percentage of the participants' subgroup are (50%) for patients with ages between (49-57) years old, and for gender male and female, both have an equal percentage (50 %) evenly distributed, while more than half of them (55%) live in urban residents. All of the samples in group I (100 %) don't have daily sports practice, while (60 %) of this group are overweight; and (60 %) of them have three meals on daily basis. Concerning group II (the sample group that uses Boswelliaserrata without Metformin), the highest percentage of the participants' subgroup are (65%) for patients within ages group between (49-57) years old, male patients are higher than female (65%); with upper rural residency sample (55%). Most of them (95 %) do not have daily sports practice, with (75%) of them don't have to eat 3 meals, and also (65 %) of the sample are overweight. In regards to the control group (the sample group that does not take Boswelliaserrata), the highest percentage of the participants' subgroup are (45%) for patients with ages group (40-48) years old, most of the gender (70%)are male patients; with (65%) of them live in rural residents, all of them (100%) have no daily sports practice while (45 %) of them use three meals, and same result (45 %) to overweight sample.

Table (2) Differences in the level of glycosylated hemoglobin (HBA1C) among the three groups in pretest

HBA1C mg\dl	Group I (No. = 20)		Group II(No. = 20)		Control(No. = 20)		F test	P-value	(Sig.)
	Mean	SD	Mean	SD	Mean	SD			

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Pretest	9.66	1.30	9.93	2.09	9.69	1.45	0.16	(0.85)	NS

SD : Standard Deviation ; sig. : significances; NS : Non-significant at P value >0.05

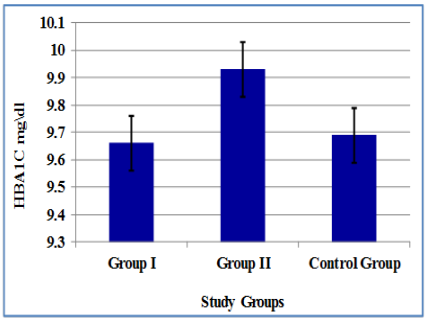

Figure (1) Differences in the level of glycosylated hemoglobin (HBA1C) among studied groups pretest administration

Table (2) and figure (1) show the differences in the level of glycosylated hemoglobin (HBA1C) among the three studied groups in pretest and before administration of Boswelliaserrata to study group I and II. According to this table, there is no significant difference (P >0.05) between group I, group II and the control group in regards to the level of glycosylated hemoglobin (HBA1C).

Table (4.3) Differences in lipid profile among studied groups before administration of Boswellia serrate

Indicators	`Group I(No. = 20)		Group II(No. = 20)		Control(No. = 20)		F test P value (Sig.)
	Mean	SD	Mean	SD	Mean	SD	
HDL mg\dl	29.62	9.00	27.16	6.53	27.53	7.71	0.57 0.56 (NS)
LDL mg\dl	137.18	35.97	145.88	30.93	158.29	34.30	1.97 0.14 (NS)
Cholesterol mg\dl	210.65	39.57	212.90	41.63	235.20	35.48	2.84 0.07 (NS)
Triglyceride mg\dl	225.10	60.64	204.65	70.86	231.60	76.17	0.39 0.67 (NS)

SD : Standard Deviation ; NS : Non-significant at P value >0.05

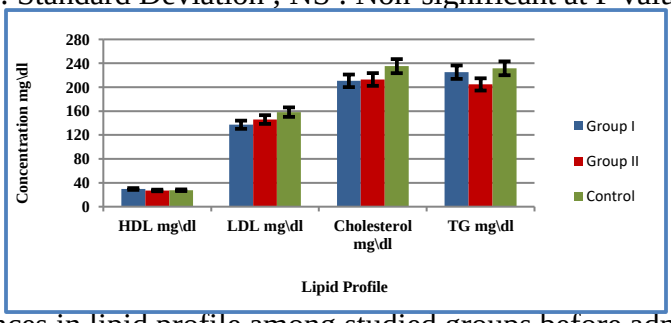

Figure (4.2) Differences in lipid profile among studied groups before administration of Boswellia serrate

Table (4.3) and figure (4.2) show the Differences in lipid profile among studied groups before administration of Boswellia serrate . According to this table, there is no significant difference (P

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>0.05) between group I, group II and control regarding lipid profile before administration of Boswellia serrate .

Table (3) Differences in the level of glycosylated hemoglobin (HBA1C) among the three studied groups posttest

Indicators	Study Group I (No. = 20)		Study Group II (No. = 20)		Control Group (No. = 20)		F test	P value	Sig
	Mean	SD	Mean	SD	Mean	SD			
Post test	8.00	1.38	7.78	1.68	9.55	1.41	8.36	0.001	HS

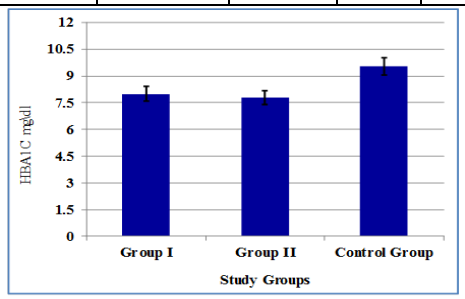

Figure (2) Differences in the level of glycosylated hemoglobin (HBA1C) among studied groups posttest administration

Table (3) and figure (2) show the differences in the level of glycosylated hemoglobin (HBA1C) among studied groups after administration of Boswelliaserrata. According to this table, there is a high significant decrease (P <0.01) in the level of glycosylated hemoglobin (HBA1C) in both I and IIgroups compared to the control group, after administration of Boswelliaserrate

Table (4.5) Differences in lipid profile among studied groups after administration of Boswellia serrate

Indicators	`Group I(No. = 20)		Group II(No. = 20)		Control(No. = 20)		F test P value (Sig.)
	Mean	SD	Mean	SD	Mean	SD	
HDL mg\dl	42.79 A	5.40	42.00 A	9.10	28.88 B	6.57	23.65 0.000 HS
LDL mg\dl	106.24 A	21.39	103.90 A	28.37	166.32 B	23.45	41.43 0.000 HS
Cholesterol mg\dl	183.35 A	26.04	179.75 A	28.35	240.55 B	29.96	29.34 0.000 HS
Triglyceride mg\dl	168.68 A	90.83	150.05 A	42.92	226.55 B	69.08	4.87 0.01 HS

SD : Standard Deviation ; HS : High Significant at P value <0.01 ; Different letters refers to high Significant Difference at p < 0.01

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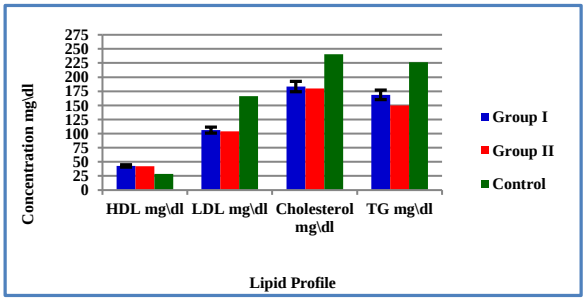

Figure (4.4) Differences in lipid profile among studied groups after administration of Boswellia serrate

Table (4.5) and figure (4.4) show the differences in in the lipid profile among studied groups after administration of Boswellia serrate . According to this table, there is a high significant decrease (P <0.01) in the level of (LDL, cholesterol and TG) and high significant increase (P <0.01) in the level of HDL , in both group I, group II compared to control group, after administration of Boswellia serrate .

Table (4) Differences in the level of glycosylated hemoglobin (HBA1C) in pre and post-test for the three groups

Groups	Level of glycosylated hemoglobin (HBA1C) mg\dl						
	Pre-Test		Post-Test		Paired T-test	P-value	Sig.
	Mean	SD	Mean	SD			
Study Group I	9.66	1.3	7.99	1.38	11.54	0.000	HS
Study Group II	9.93	2.09	7.78	1.68	7.54	0.000	HS
Control Group	9.69	1.45	9.55	1.41	0.64	0.53	NS

SD: Standard Deviation; HS High Significant at P-value <0.01 in study groups, and Non-significant at P-value >0.05 in the control group

Table (4) shows the differences that occurred before and after administering (Boswelliaserrata) to glycosylated hemoglobin (HBA1C).According to this table, the two study groups showed high significant results that were (P-value<0.01) compared to the control group that was non-significant (P-value> 0.05).

Discussion

Regarding, the current results, which showed that the majority of patients have overweight and obese, This is the product of a long-term energy deficit between consumption and production. Where obesity is considered one of the main problems in the occurrence of type II diabetes, and it is caused by either genetic, lifestyle, or unhealthy diet. Obesity is a complex disorder resulting from hereditary and behavioral factors. is correlated with several pathological dysfunctions with important repercussions for individual as well as culture Weight maintenance requires lifestyle and behavioral measures (e.g., elevated physical exercise and reduced calorie intake). Obesity is the world's most common metabolic disease and the leading cause of insulin resistance (10). The results of the current study showed that after using Boswelliaserrata supplements, the percentage

of parameters (HBA1C) decreased, a high significant increase (P <0.01) in the study group for both I and IIgroups. compared to the control group that was Non-significant at P value> 0.05 after taking Boswelliaserrata. Previous tests have shown a decrease in blood glucose and lipid profile levels, as well as the potential health effects of Boswelliaserrata supplementation in type II diabetes patients. A maximum dose of 400 mg of Boswelliaserrata orally twice daily for 12 weeks can be recommended. Methods for reducing the risk factors associated with type II diabetes that are both safe and successful (6). Furthermore, considering the substantial increase in serum triglyceride and VLDL levels of type II diabetic patients after supplementation with Boswelliaserrata in our research, a significant variation in our study did not detect differing levels after 6 weeks, according to another study. Type II diabetes can be caused by non-significant variations in the factors listed (11). Through previous contradictory studies, it can be explained that using a higher dose as in my current study, as well as a longer period than previous studies of up to three months or more gives good and positive results without any side effects from Boswelliaserrata supplements

Conclusion

Based on the results and discussions, the study concluded that using a Boswelliaserrata supplement lowers blood sugar and lipid profile. From 1200 mg of BoswelliaserrataIt's However, large-scale trials are needed possible to imagine a healthy and successful way to lower the risk factors for type II diabetes.

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