

***Effect of the Nigella sativa oil on reducing the concentration of blood glucose level in diabetes mellitus patient's in Baghdad city .***

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**Abstract:**

The study was done on 2011 and it was carried out on 84 diabetic mellitus patients, (21-71)year old, 40 type (1) and 44 type (2) in different age groups.

The blood samples were collected from fasting diabetic patients in both types for 8 hours period, the blood glucose level was measured by enzymatic method, then diabetic patients were treated orally by (2.5) ml of *Nigella sativa* oil twice daily and the fasting blood glucose level were measured for both types after treatment for 2 week, one month and two months period.

The results showed response of diabetic patient to treatment by significance ( $P < 0.05$ ) reduction in blood glucose level in different age groups with increasing the period of treatment for two months especially in diabetic patients type (2), but the reduction of blood glucose level was significance ( $P < 0.05$ ) in diabetic patients type(1) at adults and middle age except the older age had no significance.

**Key word :** Nigella sativa , Diabetes mellitus patient , Fasting blood glucose.

## تأثير زيت حبة البركة في تقليل تركيز مستوى كلوكوز الدم لمرضى السكر في مدينة بغداد.

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### المستخلص:

اجريت الدراسة عام 2011 على 84 مصاب بمرض السكر ، تراوحت اعمارهم بين (21-71) سنة 40 من النوع الاول و 44 من النوع الثاني ولمختلف الفئات العمرية حيث جمعت نماذج الدم من مرضى السكر الصائمين لمدة 8 ساعات وتم قياس مستوى الكلوكوز في الدم بالطريقة الانزيمية. اجريت بعد ذلك المعالجة لمرضى السكر للنوعين عن طريق اعطائهم فمويا ( 2,5 مل من زيت حبة البركة مرتين باليوم صباحا ومساء وقيس مستوى كلوكوز الدم بعد المعالجة بأسبوعين ، شهر وشهرين.

اظهرت النتائج استجابة مرضى السكر للعلاج حيث قل مستوى السكر بالدم معنويا وكافة الفئات العمرية كلما زادت فترة المعالجة الى شهرين وخاصة لمرضى السكر من النوع الثاني. اما النوع الاول من مرضى السكر فقد قل مستوى السكر بالدم معنويا ( $P < 0.05$ ) عند البالغين والمتوسطي الاعمار ماعدا الاعمار الكبيرة (المسنين) فقد كانت استجابتهم للعلاج غير معنوية.

### Introduction

The seed and oil of *Nigella sativa* plant have been used to promote health and fight the disease.

This plant especially used in the Middle East and South Asia, many research was done and focused to determined the effect of *Nigella sativa* oil and seed on many chemical parameter present in blood of human or animals.[1,2, 3]

The seed of *Nigella sativa* plant was called in South East Asia Kalonji. Its Arabic name is \habat-al-sauda, and its English name is black cumin. [4,5].

The chemical composition of this seed are vitamins, mineral, proteins and unsaturated fatty acid, these material may be controlled the enzyme and hormone actions and also maintained the hemostatis of biochemical species present in blood. [6,7,8]

*Nigella sativa* seed was contained active material called Nigellone which is Thymohydroquinon derivative used as natural antioxidant product and considered as xenobiotic, and used for activation the brain and reduced the temperature of the body.[8]

The *Nigella sativa* contained also alphahydrine used as anticarcinogen material in rats experiment.[9]

The extract of *Nigella sativa* was used to reduce the blood glucose level in rats [10,11].

The present study was appeared the role of medical plant oil on diabetes millitus' patient for both type 1 and 2 patients.

Diabetes mellitus is one famous common disease in the world, it is one of metabolic disorder and lead to many complication such as arterial , heart, kidney retainopatho disease [11,12].

The *Nigella sativa* has been hypoglycemic activity in research was done on animals [12,13].

The aim of this study was to find the effect of *Nigella sativa* oil on reduction of blood glucose level on diabetic patients type1 and 2 in different ages for both sexes.

## Material and method

This prospective study was carried out on patients with diabetic mellitus type (1) and (2) on 2011. Blood samples were collected from eighty four patients, 50 females and 34 males, 40 patients type (1) and 44 patients type (2).

The age of patients were ranged between (21-71) year old and were divided to age groups.

And then divided according to type of disease to:

- Diabetic patients type (1)
- Diabetic patients type (2)

Blood samples were collected from 8 hours fasting patients, the blood glucose level was measured before treatment in two groups using enzymatic method for glucose determination. Using blood sugar Kit supplied from Joaguim –Sa Spain .The serum samples that contained glucose was oxidized to D.gluconate by glucose oxidase enzyme with formation of hydrogen peroxide in the presence of peroxidase . Amixture of phenol and 4- amino antipyrene was oxidized by hydrogen peroxide to form quinoneimine dye which was proportional to the concentration of glucose in the sample , and the

absorbance of samples were read at 500 [14] .Then two groups were treated orally by giving (2.5)ml of *Nigella sativa* oil twice daily.

The fasting blood glucose level was measured for two groups after treatment for two week, one month and two month period.

The *Nigella sativa* was 100% natural oil concentration used for pharmacological usage as drugs and all patients was given the same kind of the *Nigella sativa* oil.

### Statistical analysis

T-test was used to measured the p-value between the fasting blood glucose level before and after treatment for three period times.

### Results and discussion

The chemical composition of *Nigella sativa* oil revealed the presence of both fixed and volatile oils where as the volatile oil was importance and active oil ranged from (0.4 -0.7%) of the seed weight, various research was done in the world reported the pharmacological action of the whole seeds of *Nigella sativa* and may be due to the volatile oil and its constituents of □- thymoguinone [15,16].

The treatment of human volunteers by 2.5 ml of *Nigella sativa* oil dose twice daily orally produced clear and significant changing in fasting blood glucose level and giving reduction in concentration of fasting blood glucose level and these changes appeared by the tabulated result was given in this study.

Table (1) showed the reduction in concentration of fasting blood glucose level in type (1) diabetic patients after orally treatment by *Nigella sativa* oil for two weeks period. Higher percentage reduction was 21.2% in patients had age group between (20-30) years old and p-value was less than (0.05) it was meant significant reduction in blood glucose level. It might be due to responsibility of younger age group to treatment higher than other age groups, but the percentage reduction had lower value in age group of (61-70) years old (2.48%) and p-value was higher than (0.05) it was not significance changes in elderly patients, these might be due to malabsorption for *Nigella sativa* oil in old patients by small intestine .

Table (2) appeared the changed in fasting blood glucose level after treatment by *Nigella sativa* oil for period one month in diabetes mellitus patients type (1). The results pointed that the higher

reduction in fasting blood glucose level in age group between (51-60) , and the reduction percentage was (23.3) and p-value was less than 0.01. It was highly significance changes while the lower value was found in age group (61-70) because the reduction percentage equal (1.71) and P-value higher than (0.05) , it was not significance change in blood glucose level in old patients.

Table (3) was seen the changed in concentration of blood glucose level after treatment by *Nigella sativa* oil for period two months, in diabetes mellitus patients type(1) the higher reduction changes in fasting blood glucose level was found in age groups between (20-30) and (31-40) and equal to (15.7 and 15.6%)and p-value was lower than (0.05).It was significant changes in blood glucose level for patients type(1) and the lower reduction was found in age group between (61-70) years old, the percentage reduction was( 0.68%) and the p-value was higher than (0.05), it was not significance reduction in blood glucose level in old patients type (1) diabetes mellitus.

Table (4) was explained the reduction in fasting blood glucose level after treatment by *Nigella sativa* oil for period two week in diabetes mellitus type (2) patients, the higher reduction in blood glucose level found in age group between(-31-40) years old and percentage reduction was (25.4%) and p-value was less than (0.05), it was significant reduction in blood glucose level while the lower reduction in blood glucose level found in age group lied between (61-70) years old the percentage reduction was (7.68%) and p-value was higher than (6.8), it was not significant changes in blood glucose level.

Table (5) was appeared the reduction in fasting blood glucose level after treatment by *Nigella sativa* oil for period one month in diabetes mellitus type (2) patients. The higher reduction in fasting blood glucose level found in age group between (31-40) years old. The reduction percentage was (41.8%) and p-value lower than (0.01) is highly significant changes in fasting blood glucose level due to effect of *Nigella sativa* oil on concentration of glucose level but the lower reduction was found in age groups between (51-60) years old and the reduction percentage was (11.1%) and p-value was higher than (0.05), it was not significant changes in blood glucose level in this age group.

Table (6) was shown the higher reduction in blood glucose level appeared in age group between (31-40) years old and the percentage reduction was (28.4%) and p-value was lower than (0.05) it was significant changes in blood glucose level while the lower reduction in

concentration was appeared in age groups (61-70) years old , the reduction percentage was (16.4%) and p-value was lower than (0.05), it was significant reduction in blood glucose level in all ages group in type (2) diabetes mellitus patients and this emphasized that , the best treatment by *Nigella sativa* found in period two month for type (2) diabetes mellitus patients.

From proceeding result was found that the reduction changes in blood glucose level increased with increasing period of treatment to two month in all ages group of diabetes mellitus patients type (2) while the reduction changes in diabetes mellitus patients type (1) appeared that there was responsibility to seed oil in younger patients and middle age patients but the older age had small reduction in concentration of blood glucose level it might be due to malabsorption of seed oil in small intestine.

The mechanism of reduction blood glucose level by *Nigella sativa* oil may be due to increase the level of insulin secretion by activation B cell of langerhans in pancreas or effected the oil seed on reduction the absorption of glucose in small intestine and may be activation the immune system for defending the body or due to increase permeability of cell to glucose It may be control the level of blood glucose by these process such as glycogenolysis ,lipolysis ,ketogenesis and regulated secretion of stress hormones to reduced blood glucose level. The N-sativa oil may be acted through cell membrane receptors and main target tissue in liver , muscle and adipose tissue to switch on path way process involved cellular up take and storge metabolic feul and switch of path way involved in feul break down. The oil might be also increased glycolysis splitting of glucose to form pyruvate molecules and energy . [18.17].

The studies was done before applied on the effect of the treatment by whole *Nigella sativa* seed on the level of blood glucose in the animals like rats and rabbits only, but our study differ from other because it used oil seed only and applied on human being, volunteers and it was succeed in reduction of blood glucose level in diabetes mellitus patients type 1 and 2 in different ages by using *Nigella sativa* oil only in three period times.

**Table (1)**  
**The concentration of fasting blood glucose level (mmole/l) measured before and after treatment by *Nigella sativa* oil for two week period for diabetes mellitus type (1) patients**

Nº of patients	Ages in years	fasting blood glucose level (m mole/l) before treatment	fasting blood glucose level (m mole/l) after two week treatment	Percentage Reduction After treatment	p-value after treatment
8	R= 20-30.5. M= 24.2 SD= ±6.2	R=15.5-16.6 M=14.2 Sd= 2.7	R=8.5-11.7 M=11.2 SD=±3.2	21.2	<0.05
8	R= 31-40 M= 38.2 SD= ±8.8	R=10.9-14.2 M=10.2 SD=±2.7	R=9.1-12.9 M=10.4 SD=±2.2	1.9	>0.05
12	R= 41-50 M= 46.7 SD= ±5.6	R=7.2-15 M=13.5 SD=±2.3	R=6.7-11.7 M=11.3 SD=±2.6	15.5	<0.05
12	R= 51-60 M= 55 SD= ±5.2	R=11.6-18.3 M=16.3 SD=±2.1	R=10-17.3 M=14.6 SD=±2.15	14.1	<0.05
4	R= 61-70 M= 66 SD= ±5.6	R=27.8-29.3 M=29 SD=±0.3	R=27.7-28.6 M=28.3 SD=±0.54	2.48	>0.05

Red= reduction percentage R= range M=mean SD=standard deviation P= probability

**Table (2)**  
**The concentration of fasting blood glucose level (m mole/l) measured before and after treatment by *Nigella sativa* oil for period one month for diabetes mellitus type (1) patients**

Nº of patients	Ages in years	fasting blood glucose level (m mole/l) before treatment	fasting blood glucose level (mmole/l) after one month treatment	Percentage Reduction After treatment	p-value after treatment
8	R= 20-30 M= 24.2 SD= ±6.2	R=15.5-16.6 M=14.2 SD=±2.27	R=10.27-12.4 M=11.6 SD=±2.2.3	18.3	<0.05
8	R= 31-40 M= 38.2 SD= ±8.8	R=10.9-14.2 M=10.5 SD=±2.5	R=8.6-12.8 M=10.1 SD=±2.25	3.8	>0.05
12	R= 41-50 M= 46.7 SD= ±5.6	R=7.2-12.2 M=11 SD=±2.28	R=7-11.6 M=9.6 SD=±1.57	12.7	<0.05
12	R= 51-60 M= 55 SD= ±5.2	R=11.6-18.3 M=16.3 SD=±1.62	R=10.5-15.5 M=12.5 SD=±1.2	23.3	<0.01
4	R= 61-70 M= 66 SD= ±5.6	R=27.8-29.4 M=29.1 SD=±0.52	R=28-29 M=28.6 SD=±0.78	1.71	>0.05

Red= reduction percentage R= range M=mean SD=standard deviation P= probability

**Table (3)**  
**The concentration of fasting blood glucose level (m mole/I) measured before and after treatment by *Nigella sativa* oil for period two month for diabetes mellitus type (1) patients**

Nº of patient	Ages in years	fasting blood glucose level ((m mole/l) before treatment	fasting blood glucose level (m mole/l) after two month treatment	Percentage Reduction After treatment	p-value after treatment
8	R= 20-30 M= 24.2 SD= ±6.2	R=15.5-16.6 M=14.2 SD=±2.5	R=10.2-12.9 M=12 SD=±2.67	15.7	<0.05
8	R= 31-40 M= 38.2 SD= ±8.8	R=10.5-14.2 M=10.9 SD=±2.2	R=8.5-12.5 M=9.2 SD=±2.1	15.6	<0.05
12	R= 41-50 M= 46.7 SD= ±5.6	R=7.2-16.3 M=12.2 SD=±2.6	R=7-11.8 M=11.5 SD=±2.3	5.7	>0.05
12	R= 51-60 M= 55 SD= ±5.2	R=11.6-18.3 M=16.3 SD=±1.48	R=15.5-16.6 M=15.4 SD=±2.3	5.5	>0.05
4	R= 61-70 M= 66 SD= ±5.6	R=27.8-29.3 M=29.1 SD=±0.3	R=28.3-29.3 M=28.9 SD=±0.32	0.68	>0.05

Red= reduction percentage R= rang M=mean SD=standard deviation P= probability

**Table (4)**  
**The concentration of fasting blood glucose level (m mole/I) measured before and after treatment by *Nigella Sativa* oil for period two week for diabetes mellitus type (2) patients**

Nº of patients	Ages in years	fasting blood glucose level (m mole/l) before treatment	fasting blood glucose level (m mole/l) after two week treatment	Percentage Reduction After treatment	p-value after treatment
8	R= 20-30 M= 24.2 SD= ±6.2	R=11.1-19.2 M=15.1 SD=±2.19	R=9.3-17.5 M=12.7 SD=±0.56	15.8	<0.05
8	R= 31-40 M= 38.2 SD= ±8.8	R=7.6-18.5 M=16.5 SD=±0.96	R=17.6-7.3 M=12.3 SD=±1.03	25	<0.01
6	R= 41-50 M= 46.7 SD= ±5.6	R=8.8-11.6 M=10.1 SD=±1.17	R=7.5-11.1 M=9.3 SD=±2.4	7.9	>0.05
8	R= 51-60 M= 55 SD= ±5.2	R=7.3-14.1 M=9.9 SD=±1.48	R=6.7-12.4 M=8.8 SD=±2.17	11.2	<0.05
10	R= 61-70 M= 66 SD= ±5.6	R=8.1-11 M=10.3 SD=±1.27	R=8.4-10.7 M=9.6 SD=±1.71	6.8	>0.05

Red= reduction percentage R= range M=mean SD=standard deviation P= probability



**Table (5)**  
**The concentration of fasting blood glucose level (m mole/l) measured before and after treatment by *Nigella sativa* oil for period one month in diabetes mellitus type (2) patients**

Nº of patients	Ages in years	fasting blood glucose level (m mole/l) before treatment	fasting blood glucose level (m mole/l) after one month treatment	Percentage Reduction After Treatment	p-value after treatment
8	R= 20-30 M= 24.2 SD= ±6.2	R=11.1-19.2 M=15.11 SD=±1.94	R=8.05-14.1 M=11.05 SD=±1.8	26.8	<0.05
8	R= 31-40 M= 38.2 SD= ±8.8	R=7.6-18.5 M=16.5 SD=±1.98	R=7.6-11.6 M=9.6 SD=±1.87	41.8	<0.01
6	R= 41-50 M= 46.7 SD= ±5.6	R=8.8-11.6 M=10.1 SD=±1.17	R=8.5-10.2 M=8.8 SD=±1.36	12.8	<0.05
8	R= 51-60 M= 55 SD= ±5.2	R=7.3-14.1 M=9.9 SD=±1.58	R=6.7-12.5 M=8.8 SD=±2.6	11.1	<0.05
10	R= 61-70 M= 66 SD= ±5.6	R=8.16-11.1 M=10.3 SD=±1.27	R=8-12.2 M=9.05 SD=±0.82	12.13	<0.05

Red= reduction percentage R= range M=mean SD=standard deviation P= probability

**Table (6)**  
**The concentration of fasting blood glucose level (m mole/l) measured before and after treatment by *Nigella sativa* oil for period 2 month for diabetes mellitus type (2) patients**

Nº of patients	Ages in years	fasting blood glucose level (m mole/l) before treatment	fasting blood glucose level (m mole/l) after two week treatment	Percentage Reduction After treatment	p-value after treatment
8	R= 20-30 M= 24.2 SD= ±6.2	R=11.1-18.8 M=15.1 SD=±2.1	R=8.6-15 M=12.27 SD=±1.86	18.7	<0.05
8	R= 31-40 M= 38.2 SD= ±8.8	R=7.6-18.5 M=16.5 SD=±1.19	R=6.8-16.6 M=11.8 SD=±1.45	28.4	<0.01
6	R= 41-50 M= 46.7 SD= ±5.6	R=8.8-11.6 M=10.1 SD=1.19	R=7.8-8.8 M=8.3 SD=±1.17	17.8	<0.05
8	R= 51-60 M= 55 SD= ±5.2	R=7.8-14.1 M=9.9 SD=±1.48	R=6.6-11.1 M=8.16 SD=1.58	17.5	<0.05
10	R= 61-70 M= 66 SD= ±5.6	R=8.16-11.1 M=10.3 SD=±1.17	R=7.8-9.8 M=8.6 SD=0.85	16.4	<0.05

Red= reduction percentage R= range M=mean SD=standard deviation P= probability

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