

Effect of drenching aqueous extract of *Allium Proroum* seeds on some Seminal characteristics of Alloxan hyperglycemic rabbits

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Summary:

This study was carried out on 24 mature Vasectomied local male rabbits. The male rabbits then randomly allocated into three equal groups of eight animals each. The first group was left healthy and regarded as control group. The second and third groups were injected 150mg/kg body weight alloxan in the ear vein for three successive days in order to render them diabetic and after a month from occurrence of diabetes , the second group was treated by drenching each animal 5ml/day aqueous extract of allium pororum seeds for three weeks, the third group was left without treatment. Then the epididymis of each animal was isolated to get the semen and study their characteristics. Results obtained were as follows :

- 1- Diabetes clearly occurred after alloxan injection as blood glucose level was high.
- 2- Aqueous extract of allium pororum seeds has a significant effect on decreasing alloxan hyperglycemia.
- 3- All seminal characteristics of alloxan diabetic male rabbits were significantly deteriorated .
- 4- Significant improvement in seminal characteristics were found in alloxan diabetic male rabbits treated by 5ml/animal /day of aqueous extract of allium pororum seeds for three weeks.

Keywords : Allium Proroum, Seminal characteristics, Alloxan

Introduction:

Diabetes mellitus is defined as chronic disturbance in metabolism of carbohydrates , lipids and protein as to unsuccessful response of cells to it which lead to elevate blood glucose level. [11]and[18].Diabetes is divided into two main types [1] those types are :-

- 1- Primary diabetes which is clinically divided into two types. The first is insulin dependant type or the first type which occurs due to damage of beta cells of Islets of langerhans. [17]. The second type is non insulin dependant diabetes which occur after the age of forty in human which can be caused by

the resistance of cells ; muscular and adipose tissues to insulin effect or due to weakness of beta cells of pancreas to produce and secrete insulin hormone. [4].

- 2- Secondary diabetes, this type occurs due to the presence of any factor affect beta cells or pancreas as a whole which lead to stop the ability to secrete insulin hormone such as a cute pancreatitis or viral infection of pancreas or some endocrine diseases or due to the increase percentage of some hormone which have anti insulin effect. [3].

Allium pororum plant was used by some workers to investigate its, antidiabetic effect when they found that oil isolated from the plant has an important role in decreasing blood glucose and cholesterol [12]. So the aim of this study is to find the effect of diabetes on seminal

characteristics and diabetes treatment by aqueous extract of allium pororum seeds as a new important use of the plant instead of chemical compounds to treat diabetes by prevalence of cheap sources of treatments which has no side effects.

Martial and Methods:

In this study 24 mature local male rabbits are used. All of them were subjected to bilateral surgical vasectomy to enable us to get the semen which accumulate in the tail of the epididymis due to non ejaculation. After 10 days from vasectomy blood glucose level was measured in all experimental male rabbits before fasting and after fasting for two days. Blood glucose level was measured by using digital system called, " Accoutrend alpha[®] made by (Boehringer, Mannheim, Germany) and by using strips "Acuterend glucose blood test strips" mad by (Boehringer, Mannheim, Germany).After that the animals were randomly allocated into three equal groups of eight animals each. Two groups of them (16male rabbits) were injected through the marginal ear vein by 150mg/kg of alloxan dissolved in normal saline for three successive days in order to render them diabetic because alloxan will damage the beta cells of islets of Langerhans of the pancreas which secrete insulin hormone. The third group remain intact and serve as a control group (not diabetic). After three days of alloxan injection, blood glucose levels were measured after the animals were fed carbohydrate only and drenched a daily dose of water sugar solution. After a month of diabetes induction, blood sugar (Eight male rabbits) by 5 ml of aqueous extract of allium pororum seeds which prepared as follows: The dried seeds of allium pororum were purchased from the local market at Basrah , 75 grams of the seeds were powdered and defatted with hexane. The combined hexane extract was concentrated below 5C^o under reduced pressure in a rota vapour to get 25 gm of dark brown

oily mass.This mass was dried at room temperature and then further extracted with distilled water (500ml) and then the combined distilled water was concentration under reduced pressure below 5C^o to 7 mgs of the aqueous extract[9].The treatment by this aqueous extract were for three weeks, then blood glucose was measured for the last time; then all animals were killed in order to get the semen which was accumulated in the tail of the epididymis for examination and evaluation to know the effects of treatment of diabetic rabbits by water extract of allium pororum seeds on both diabetes and semen characters. After killing the animal, testes were exposed and epididymis was taken which was enlarged and full of semen, then it was squeezed in petridish.

The collected semen was subjected to examination and evaluation by measuring semen concentration and semen counting using improved Neobaer chamber which is used for counting of red blood cells. Percentage of sperm motility by examining a drop of the semen on glass slide covered by a cover slip and also degree of individual motility of spermatozoa was recorded.Then a seminal smear was done and stained by eosin- nigrosin stain in order to enumerate live, dead and abnormal spermatozoa. Number of white blood cells in the semen was calculated using the same slide of counting red blood cells but using the large squares of counting white blood cells. Student (t) test was used according to [14]to compare between means of glucose of diabetic and no diabetic and between treated and non treated. In comparison seminal characteristics in three groups we used one way analysis of variance (

ANOVA) test they we used Dunken test to

compare between means a according to [6].

Result and Discussion:

Table (1) indicates normal and random blood glucose levels of rabbits before and after fasting which were ranged between 120-126 mg/dl and the table shows glucose percentage of alloxan diabetic rabbits after 3 days and one month from alloxan injection. It indicates that glucose level increased from 197.9mg/dl after 3days to 309.5mg/dl after one month which is significant increase if it is compared with the general blood glucose percentage 123.7mg/dl (Table1). The table also indicates the effect of drenching alloxan diabetic rabbits with 5ml aqueous extract of *Allium pororum* seeds which leads to significant decrease of blood glucose level to 156mg/dl when it was 309.5mg/dl before treatment ($P < 0.01$) or in non treated diabetic group. This high significant decrease exactly agrees with what is found by [12] and with [10] when they found significant effect of *Allium pororum* seeds extract to decrease alloxan diabetes in rabbits. The result of the effects of alloxan diabetes on semen characteristics are shown in table (2) which indicate that diabetes had negative significant effects on

all semen characteristics begined by spermatozoa concentration when decreased in this study which is on the contrary to what is mentioned by some studies when it was found that sperm concentration increased in spite of less ejaculate volume [3,16].

The obtaining of semen in this study by Vasectomy made it easy to a accomplish the results because it is not possible to obtain semen from the diabetic male rabbits by ejaculation when [8] and [5] mentioned that diabetic persons may fail to ejaculate compared with sound persons. The abnormal spermatozoa are increased in this study from 10% in normal rabbits to 40% in diabetes ones; this result is confirmed by the result of [13,15,7] when all of them mentioned that there was an increase of abnormal percentage of spermatozoa in case of diabetes. It is clear from the result (table 2) that drenching aqueous extract of *Allium pororum* seeds had decreased blood glucose percentage and at the same time it made seminal characteristic of alloxan diabetes rabbits better than in non treated animals.

Table(1):Mean percentage of blood sugar of experimental animals before and after alloxan diabetes induction and before and after treatment by pororum extract (Mean mg/dl ±S.D)

No. of animal	Mean percentage of random blood glucose	Mean percentage of fasted blood glucose	Mean percentage of general blood glucose	Mean blood glucose percent after 3 days of diabetes induction	Mean blood glucose percent after one month of diabetes induction	Mean percentage of blood glucose of control group	Mean percentage of blood glucose of diabetic induced group	Mean percentage of blood glucose of diabetic induced group not treated with extract after a month of induction	Mean percentage of blood glucose of diabetic induced group after treatment with extract for a month
24	127.333 ± 4.332	120.231 ± 12.423 N.S	123.782 ± 8.642 N.S	197.6 ± 7.6	** 309 ± 12.5	123.782 ± 8.642	** 309.5 ± 12.5	309 ± 12.5	156.00 ± 1.00

** = Significant between each two adjacent parameters at 1% level (P< 0.01) by Student T Test .
N.S = Non significant .

Table(2):Effect of diabetes induced by alloxan and treatment by Allium poroum seeds aqueous extract on seminal characteristic of mature male rabbits.

Semen characteristics	Control group	Diabetic induced group not treated by Allium pororum extract	Diabetic induced group treated by Allium pororum ext.
1- Sperm concentration	115 X 10 ⁶ A	40 X 10 ⁶ B	80 X 10 ⁶ C
2- Percentage of sperm motility	95% A	45% B	75% A
3- Degree of motile spermatozoa	4.5 A	2.5 B	3.5 C
4- Percentage of live spermatozoa	90% A	50 % B	78 % A
5- Percentage of dead spermatozoa	10% A	50 % B	22 % C
6- Percentage of abnormal spermatozoa	10 % A	40% B	30 % C
7- Concentration of white blood cells	0.3 X 10 ³ A	0.75 X 10 ³ B	0.5 X 10 ³ C

Different letters horizontally means there id significant difference(P< 0.05)

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تأثير المعالجة بالمستخلص المائي لبذور نبات الكراث في صفات مني ذكور
الأرانب المصابة تجريبياً بالسكري

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الخلاصة :

أجريت هذه الدراسة على 24 ذكر أرنب محلي، خضعت جميعها إلى عملية قطع الاسهر (الوعاء المنوي الناقل) وذلك لتسهيل الحصول على السائل المنوي بعد قتل الحيوانات. قسمت هذه الحيوانات عشوائياً إلى ثلاث مجموعات ، كل مجموعة احتوت ثمانين حيوانات. تركت المجموعة الأولى سليمة و اعتبرت مجموعة سيطرة. أما المجموعتان الثانية والثالثة فقد تم حقن كل حيوان منها بما مقداره 150 ملغم/كغم من وزن الجسم بمادة الالوكسان المذاب في المحلول الملحي الطبيعي في الوريد الالذني الحافي لمدة ثلاثة أيام متتالية لغرض استحداث حالة فرط السكر فيها . وبعد مرور شهر على استحداث السكر عولجت المجموعة الثانية بتجريب كل حيوان فيها بما مقداره كمل باليوم من المستخلص المائي لبذور نبات الكراث لمدة ثلاثة أسابيع ، أما المجموعة الثالثة فقد تركت بدون تجريب. بعد ذلك تم قتل جميع الحيوانات وتم اخذ البربخ من كل حيوان وعصر في طبق بتري للحصول على السائل المنوي لدراسة صفاته وكانت النتائج المستحصل عليها كالتالي:-

- 1- تم استحداث السكري بشكل واضح بعد حقن الالوكسان وكانت الحيوانات المحقونة به ذات مستوى سكر عالي بصورة مقارنة بالحيوانات غير المحقونة.
- 2- كان لتجريب المستخلص المائي لبذور نبات الكراث تأثيراً عالي المعنوية بتقليل نسبة السكر في الحيوانات المستحدث بها بواسطة الالوكسان.
- 3- ظهور تدهور واضح وعالي المعنوية في جميع صفات السائل المنوي في الحيوانات المستحدث بها السكر بالالوكسان .
- 4- ظهور هناك تحسن واضح ومعنوي لجميع صفات السائل المنوي في الحيوانات المصابة بالسكري بعد معالجتها بالمستخلص المائي لبذور نبات الكراث لمدة ثلاثة أسابيع.