

Effect of Royal Jelly on male Infertility

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Abstract

Male infertility may occur due to different causes, therefore , different therapeutic approaches have been applied in order to improve the ability of men to get children . Semen analysis is used to determine the fertility potential in males, but the occurrence of pregnancy is the evidence of sperm ability for fertilization. Although male fertility is affected by food and nutrients, but little attention is paid for the use of Royal Jelly and no previous studies on the use of Royal Jelly in the treatment of male infertility. Eighty – three infertile men were treated with Royal Jelly, twenty – two with 100mg Royal Jelly, twenty –one with 50mg Royal Jelly, twenty with 25mg Royal Jelly and twenty with pure honey. Our study showed that, the treatments were safe and there were no side effects. After three months of treatment , the sperm active motility , testosterone level , Lutelizing hormones level , sluggishly motile sperm and intercourse / week increased significantly in infertile men treated with Royal Jelly , while sperm count and FSH level increased not significantly . On the basis of results, Royal Jelly is safe and effective in the treatment of male infertility.

Key words: Royal Jelly, male infertility

الخلاصة

يحدث العقم لدى الذكور لأسباب عديدة ولذلك فإن مناهج علاجية عديدة تستخدم لتحسين قدرة الرجال على إنجاب الأطفال ، إن تحليل المنى يجري لتحديد القدرة على الإخصاب في الذكور ولكن حصول الحمل هو الدليل على قدرة الحيامن على الإخصاب ، وبالرغم من ان خصوبة الذكور تتأثر بالغذاء ولكن هناك اهتمام قليل بدراسة تأثير الغذاء الملكي ولا توجد دراسات سابقة على استخدام الغذاء الملكي في علاج العقم عند الرجال لهذا فإن الدراسة الحالية تضمنت علاج الذكور المصابين بالعقم الذين يراجعون عيادة العقم في تكريت ٨٣ ذكر عقيم عولجوا بالغذاء الملكي منهم ٢٢ ذكر عقيم عولج بجرعة ١٠٠ ملغم غذاء ملكي ، ٢١ ذكر عقيم عولج بجرعة ٥٠ ملغم غذاء ملكي ، ٢٠ ذكر عقيم بجرعة ٢٥ ملغم غذاء ملكي و ٢٠ ذكر عقيم عولج بجرعة ١٠ غم عسل نقي لقد أظهرت دراستنا ان العلاجات كانت أمينة ولم تسجل أي أعراض جانبية مهمة بعد ثلاثة أشهر ، كانت نسبة النطف ذات والنطف ذات الحركة LH الحركة الفعالة ومستوى هرمون التستوستيرون الخصوي ومستوى هرمون البطينة وعدد مرات الجماع الأسبوعية زادت بشكل ملحوظ إحصائيا في المرضى المعالجين بالغذاء لم تزيد بشكل ملحوظ إحصائيا FSH الملكي بينما عدد النطف ومستوى هرمون وبناءً على النتائج فإن الغذاء الملكي أمين وفعال في علاج العقم لدى الرجال

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Introduction

Male infertility is defined as inability of the wife to conceive after one year of continuous unprotected inter course ⁽¹⁾. Several etiological factors in male infertility have been identified. Good nutrition also plays a helpful role in the continuous production of sperm cells ⁽²⁾.

Royal Jelly is a cream product secreted by young nurse worker bees for feeding to the queen, queen larvae and other young larvae. It is totally synthesized by the bees in the hypopharangeal and mandibular glands and is derived from the proteins of other nutrients in the pollen ingested by the secreting bees. Royal Jelly consists of an emulsion of proteins, sugars of lipid in water base ⁽³⁾. All larvae are fed Royal Jelly for three days, but the queen bee eats royal Jelly exclusively, which makes her fertile and able to live for five to seven years. In contrast, worker bees are sterile and live for seven to eight weeks. Royal Jelly has a reputation for maintaining youthfulness in humans ⁽⁴⁾.

Fresh royal Jelly contains glycolic acid which is mono unsaturated fatty acid that protects skin from dehydration ⁽⁵⁾. Royal Jelly contains also B-plex vitamins, pantothenic acid (B5), pyridoxine (B6), acetylcholine and vitamins (A,C,D and B), minerals, enzymes, hormones, 29 amino acid and antibiotic components. It has abundance of nucleic acid (DNA, RNA). Gelatin which is one

of the precursors of collagen, which is a powerful anti-aging element that helps preserve the youth of the body ⁽⁶⁾.

Royal Jelly is a hormonal stimulant of help to keeps hormones of metabolic function regulated and normalized and it is an energy enhancer for all ages making it in valuable in treating chronic fatigue of sexual problems ⁽⁷⁾. It also has a yeast inhibiting function, which may prevent conditions such thrush athlete's foot. It is also used to treat muscular dystrophy. It also is boosting the body's resistance to the harmful side effect of chemo therapy and radiotherapy.

Royal Jelly also contains the gamma globulin, which helps the immune system to fight infections. A review of controlled studies concluded that in humans (50-100) mg Royal Jelly /day decrease total cholesterol by 14% of Triglycerides by 10 % ⁽⁸⁾.

Patients and Methods

This study is a prospective one. It was conducted on 102 infertile men, with age range from 20-50 years, from November 2003- May 2004. The patients included where attends the clinic of urologist. Nineteen patient were excluded mainly because of poor cooperation, leaving "eighty three" patient who were included in this study.

Firstly, the gynecological examination of female partner was done to exclude any female partner cause of infertility. Then,

males examined by a specialist for complete evaluation to exclude testicular abnormalities. A questionnaire was prepared to obtain the information from the infertile men before semen analysis.

Seminal fluid analysis:

At least 2-3 semen analysis was done during 3 months of treatment for each patient before making final conclusion regarding the base line sperm parameter.

The semen was collected in the laboratory by masturbation after 3-5 days of sexual abstinence. The ejaculate was deposited in a sterile plastic container.

The seminal fluid was examined according to WHO (world health organization) ⁽⁹⁾, criteria of seminal fluid analysis:

1- Gross examination:

Liquefaction time, volume, colour, viscosity (assessed by slowly pouring the specimen from the collection bottle into a small glass- measuring graduate) of PH.

2- Microscopic examination:

Include assessment of motile and non motile spermatozoa, the degree of motility, sperm count of concentration, the percentage and type of morphologically abnormal spermatozoa, agglutination and the identification of other cell type within the ejaculate .

Hormonal analysis:

The hormonal evaluation was done by "Al- Bab-Al- Sharqi" private clinical laboratory by radio immunoassay using special bio kit for (FSH , LH and

testosterone) . The procedure mentioned by the company (CIS bio inter national) was followed .

The treatment:

Depending on the previous investigation of our 83 infertile men were treated as following:

First group: Twenty two infertile men were treated with royal Jelly "100mg" in (10gm) i.e. (one teaspoonful) honey once daily at night.

Second group: Twenty one infertile men were treated with royal Jelly (50 mg) in (10gm) honey once daily at night.

Third group: Twenty infertile men were treated with royal Jelly (25 mg) in (10gm) honey once daily at night.

Fourth group: Twenty infertile men were treated with pure honey (10gm) once daily at night. Any side effects that appeared during treatment or partners conceiving throughout and after the duration of treatment were recorded. During the period of the treatment each patient was advised to attend the clinic weekly

Statistical analysis:

Arithmetic mean (\bar{X}) and standard deviation (SD) were calculated for all parameters (before and after treatment) for each group. The results were expressed as SD.

All data were analyzed by paired t-test to determine the significance

Results:

Eighty- three patients were participating in this study . The occupations of them were soldiers(13.25%) workers (15.66%) ,

builders (7.22%) carpenters (4.8%) teachers (8.43%) , merchants (10.84%) , doctors (2.4%) , farmers (19.27%) and drivers (18.07%) .

After (3) months of treatment with Royal Jelly, the results were follow:

A- Semen analysis:

2- Active sperm motility:

Active sperm motility was significantly ($P < 0.01$) increased in patients treated by 25mg, 50mg and 100mg / day of royal Jelly for

3- Sluggishly motile sperms:

Sluggish sperm percentage was significantly increased ($P < 0.01$) in patients treated by royal Jelly in a dose and 25mg , 50mg of 100 mg

B- Hormonal analysis:

1- Follicular stimulating hormone
Statistical analysis showed that neither the effect of honey nor that

2- L.H. :

Serum LH level was increased significant by ($P < 0.01$) when infertile men treated by Royal Jelly in a dose of 25mg for 3

3- Testosterone hormone:

Serum testosterone level was increased significantly ($P < 0.01$) when infertile men were treated by Royal Jelly in a dose of 25mg for 3

C- Sexual desire (Inter course / week) :

The sexual intercourse / week was significantly increase in infertile males treated by 25mg / day and 50mg / day of Royal Jelly ($P < 0.01$) and further increased when the dose of Royal Jelly was

1 Sperm count: Sperm count was slightly insignificantly increased in all groups treated by royal Jelly. Pure honey in a dose of 10gm / day also exerted no significant effects on sperm count of there were no significant variations between the effect of honey and Royal Jelly (table I) .

three months . Honey in a dose of 10 g/day for three months exerted no significant effects on sperm motility as shown in table number (II).

day for 3 months . Honey also significantly increased sluggish sperm percentage when used in a dose of 10g for 3 months ($P < 0.05$), as shown in table number (III) .

of Royal Jelly on serum FSH was statistically significant as showing in table (IV).

months (20.3%). However no significant changes seen with other doses of Royal Jelly nor pure honey as shown in table (V).

months by a percentage of 22.01% . However no significant changes seen in other groups as shown in table number (VI) .

increased to 100mg / day ($P < 0.01$) also increased in honey treated group ($P < 0.05$) . Royal Jelly was significantly more effective ($P < 0.01$) increasing sexual desire in comparisom with honey as shown in table number (VII) .

Discussion

Royal Jelly is a thick , extremely nutrition milky white , creamy liquid secreted by the hypopharyngeal glands of the nurse bees. Queen bees live exclusively on royal Jelly and it accounts for their incredible size , they are (42%) larger of their weight (60%) more than the worker bee ⁽¹⁰⁾ .

Amazingly, they live (40) times longer than worker bee, seven years as compared to seven weeks and Queen bees will produce (2000) eggs /day ⁽¹⁰⁾ .

Royal Jelly belongs to a group of products generically described as dietary supplements ⁽¹¹⁾ , i.e. to supplement the normal diet with substances in which it might be deficient .

This study was designed to investigate the efficacy of royal Jelly in treatment of male infertility , because royal Jelly is known as the diet which increase size , weight of bees and their fertility ⁽¹⁰⁾ , furthermore , it traditionally known to prolong youthfulness , enhance sexual desire , treatment of impotence and infertility ^(11,12) .

At first , we will discuss the hormonal changes which can lead to understanding of the sperm count and motility changes .

This study show that there was no significant changes with FSH level but no significant increase in L.H level and testosterone level after treatment and this can be attributed to many

factors L.H. level increased attributed to central effect of Royal Jelly . Royal Jelly contains acetylcholine (1 mg /gr) ⁽¹²⁾ . Some studies confirmed that a cetylcholine helps to stimulate " HCG" secretion at hypothalamus level⁽¹³⁾ . Which in dum stimulate "LH" secretion but not " FSH" because " FSH stimulation needs a level more than that required for LH stimulation ⁽¹⁴⁾ .

Accordingly, L.H. is responsible for the stimulation of testosterone secretion from interstitial cells (cells of Lydig)⁽¹⁵⁾ . Adding to that, testosterone could be elevated as a result of exogenous testosterone supplied by Royal Jelly , as it contain testosterone in the amount of 0.012 g/g fresh weight .⁽¹⁶⁾ It could also be attributed to zinc found in Royal Jelly . So zinc deficiency causes low testosterone level while zinc supplementation can raise testosterone level and help increase fertility ^(17,18) .

This study also showed that Royal Jelly was slightly increased in sperm count . This effect could be attributed to increase testosterone level significantly but not FSH . Testosterone is essential for spermatogenesis ⁽¹⁵⁾ .

Royal Jelly also contains L-arginine and carnitine amino acids which were essential for spermatogenesis ⁽¹⁹⁾ .

Zinc could participate in increasing sperm count and there are positive relationships between sperm density and zinc level in

fertile and infertile men^(19,20,21).

On the other hand our study showed an increase in spermatocyte in Royal Jelly-treated men . This result could be attributed to elevation of testosterone but not FSH . Testosterone is responsible for spermatogenesis (division) , while FSH is responsible for spermatogenesis (maturation) , therefore, appearance of spermatocytes in seminal analysis could reflect high level of testosterone but not enough FSH hormone to complete maturation⁽¹⁵⁾.

Royal Jelly also significantly enhanced semen motility and this is can be explained by the increase in testosterone level which is responsible for motility of the sperms . Furthermore Royal Jelly enhances the production of seminal fluid from secondary sex organs , which play the main role in the viability and motility of the sperm through the nutritional supply⁽²²⁾.

In addition zinc content of royal Jelly could play a role in enhancement of sperm motility^(23,24).

Sexual intercourse was also increased in Royal Jelly- treated infertile men . This result could be attributed to the elevated testosterone level , the hormone that stimulates male libido⁽²⁵⁾.

Furthermore Vit. C, Vit. B and arginine were increase libido

and that was reflected by the increase the frequency of sexual intercourse (16,21,28).

Table (I) : The effect of Royal Jelly on sperm count in different doses for 3 months

| Semen parameter | Treatment with royal Jelly | Before treatment X ± SD | After treatment X ± SD | P value | Percentage of change |
|-------------------------|--------------------------------|----------------------------|---------------------------|---------|----------------------|
| Active sperm motility % | 1 st group 100 mg | 52.4 ± 29.3 | 55.3 ± 27.8 | N.S | + 5.24% |
| | 2 nd group 50 mg | 50.7 ± 30.6 | 54.3 ± 30.5 | N.S | + 6.62% |
| | 3 rd group 25 mg | 45 ± 25.2 | 45.6 ± 26.6 | N.S | +1.31% |
| | 4 th 10g pure honey | 39.8 ± 23.7 | 40.8 ± 24.3 | N.S | +2.45% |

N.S : not significant .

Table (II): The effect of Royal Jelly on active sperm motility.

| Semen parameter | Treatment with royal Jelly | Before treatment X ± SD | After treatment X ± SD | P value | Percentage of change |
|-------------------------|--------------------------------|----------------------------|---------------------------|----------|----------------------|
| Active sperm motility % | 1 st group 100 mg | 23.7± 13.4 | 35.2 ± 20.2 | P < 0.01 | + 32.60% |
| | 2 nd group 50 mg | 30± 14.1 | 41.2 ± 17.6 | P < 0.01 | + 27.18% |
| | 3 rd group 25 mg | 29.1 ± 13.9 | 39.2 ± 17.6 | P < 0.01 | + 25.76% |
| | 4 th 10g pure honey | 27 ± 12.3 | 30.5 ± 14 | N.S | + 11.47% |

P value : level of significance between before and after treatment

,N.S : not significant .

Table (III): Effect of Royal Jelly on sluggishly motile sperm percentage .

| Semen parameter | Treatment with royal Jelly | Before treatment X ± SD | After treatment X ± SD | P value | Percentage of change |
|---------------------|--------------------------------|----------------------------|---------------------------|----------|----------------------|
| Sluggishly motile % | 1 st group 100 mg | 9.41 ± 5.65 | 13.77 ± 5.46 | P < 0.01 | + 31.60% |
| | 2 nd group 50 mg | 12.86 ± 7.23 | 17.62 ± 7.52 | P < 0.01 | + 27.00% |
| | 3 rd group 25 mg | 18.2 ± 6.85 | 22.50 ± 6.79 | P < 0.01 | + 19.10% |
| | 4 th 10g pure honey | 9.5 ± 4.84 | 12.50 ± 5.26 | P < 0.05 | + 24.00% |

P value: level of significance between before and after treatment

Table (IV): Serum FSH level before and after 3 months treatment with Royal Jelly.

| Hormonal level | Treatment with royal Jelly | Before treatment $\bar{X} \pm SD$ | After treatment $\bar{X} \pm SD$ | P value | Percentage of change |
|----------------|--------------------------------|--------------------------------------|-------------------------------------|---------|----------------------|
| FSH mIU/ ml | 1 st group 100 mg | 4.73 ± 2.86 | 5.05 ± 2.86 | N.S | + 6.33% |
| | 2 nd group 50 mg | 4.6 ± 1.77 | 5.14 ± 1.91 | N.S | + 10.5% |
| | 3 rd group 25 mg | 5.73 ± 2.17 | 6.04 ± 1.96 | N.S | + 5.13% |
| | 4 th 10g pure honey | 5.93 ± 5.14 | 6.55 ± 4.8 | N.S | + 9.46% |

P value : level of significance between before and after treatment ,N.S : not significant .

Table (V): of Royal Jelly on serum LH level before and after 3 months of treatment.

| Hormonal level | Treatment with royal Jelly | Before treatment $\bar{X} \pm SD$ | After treatment $\bar{X} \pm SD$ | P value | Percentage of change |
|----------------|--------------------------------|--------------------------------------|-------------------------------------|----------|----------------------|
| LH mIU/ml | 1 st group 100 mg | 3.7 ± 1.13 | 4.41 ± 1.14 | P < 0.01 | + 16% |
| | 2 nd group 50 50 mg | 4.28 ± 1.74 | 5.32 ± 1.47 | P < 0.01 | + 20.48% |
| | 3 rd group 25 25 mg | 4.3 ± 1.54 | 5.4 ± 2 | P < 0.01 | + 20.3% |
| | 4 th 10g pure honey | 5.25 ± 2.58 | 5 ± 2.04 | N.S | - 5% |

P value : level of significance between before and after treatment , N.S : not significant .

Table (VI): Effect of Royal Jelly on the serum Testosterone level before and after 3 months of treatment.

| Hormonal level | Treatment with royal Jelly | Before treatment $\bar{X} \pm SD$ | After treatment $\bar{X} \pm SD$ | P value | Percentage of change |
|--------------------|--------------------------------|--------------------------------------|-------------------------------------|----------|----------------------|
| Testosterone ng/ml | 1 st group 100 mg | 4.25 ± 1.64 | 5.45 ± 2.12 | P < 0.01 | + 22.01% |
| | 2 nd group 50 mg | 4.9 ± 1.8 | 6.11 ± 1.98 | P < 0.01 | + 19.80% |
| | 3 rd group 25 mg | 4.72 ± 1.77 | 5.93 ± 2.07 | P < 0.01 | + 20.40% |
| | 4 th 10g pure honey | 4.51 ± 1.85 | 4.92 ± 2014 | N.S | + 8.33% |

P value : level of significance between before and after treatment
,N.S : not significant .

Table (VII): Effect of Royal Jelly on serum FSH level.

| Treatment with royal Jelly | Before treatment $\bar{X} \pm SD$ | After treatment $\bar{X} \pm SD$ | P value | Percentage of change |
|--------------------------------|--------------------------------------|-------------------------------------|----------|----------------------|
| 1 st group 100 mg | 2.59 ± 1.14 | 3.63 ± 0.90 | P < 0.01 | + 28.76 % |
| 2 nd group 50 50 mg | 2.86 ± 1.06 | 3.61 ± 0.97 | P < 0.01 | + 20.97% |
| 3 rd group 25 25 mg | 2.70 ± 1.17 | 3.35 ± 0.87 | P < 0.01 | + 19.40% |
| 4 th 10g pure honey | 2.80 ± .834 | 3.00 ± 0.64 | P < 0.05 | + 6.66% |

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