

Effect of diluted Royal jelly on Semen quality, immunological and biochemical parameters in white rabbits

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Abstract

Background: Royal jelly was secreted from cephalic glands of nurse bees as product, this product has many activities on health especially the infertility effects. This study was design to determine the royal jell activity on rats males.

Materials and methods: - In this study the rats males were classified to four groups according to royal jell concentration that feed to them, one control and three case group. The case groups gavaged 100 ,200 300 mg/kg Royal jelly once a day, while the control group not give the Royal jelly. The feed was continuing for 30 days. The quality of semen, biochemical and immunological constituents were evaluated and performed on samples.

Results: - the sperm concentration, motility, live sperm give statistically significant difference according among study groups when camper with control group except the semen volume. The biochemical and immunological parameters (testosterone, IgG, IgM, IgA) give statically significant difference.

Conclusion: - The quality of semen parameters increased due to royal jelly consumption especially the sperm concentration and motility, RJ have characteristic that increase testosterone levels and give good immunity that lead to increase fertility in rat's males. These effects would be useful for infertile men who have low sperm count and weak sperm motility to help them for fertility.

Key words: -RJ, testosterone, Immunoglobulin

Introduction

Royal jelly (RJ) is jell like and a thick material, extremely nutritious, milky-white, creamy liquid secreted by the hypo pharyngeal and mandibular glands of the nurse bees .Royal jelly (RJ) was used for centuries for its extraordinary properties and health effects (Pavel *et al.*, 2011). There are different study funded the relation and effect of royal jelly on male fertility. Study on rabbits done by Elnagar (2010) concluded that administration of RJ to heat stressed male rabbit bucks can activated their "summer infertility" and increased their physiological status and also for growing rabbits (Elnagar *et al.*, 2010). RJ allows the complete development of the larvae in their brood cells and maintains its ovulatory capacity over its entire life-span [Märghitaş, L. A 2008]. This unusual property of RJ has spurred a possible connection to fertility and we know that RJ has always been used as a stimulator of fertility.

2. Material and methods

2.1. Subjects and study design

A total of 40 rabbit males were included in this study (10 males for each group).All of these rats feed with RJ .The RJ was given orally, using an insulin syringe directly in the oral cavity in a normal saline solution at 100, 200 and 300 mg/kg three every week until a 16-weeks .The 0 group receive only normal saline without RJ these consider as control group

Sample collection and assay procedure

The sample collection done after 4 weeks from beginning the experiment ,semen samples and the volume of ejaculate was recorded, the sperm concentration, total motile sperm, live and dead sperm was recorded by full automated sperm analyzer. The blood sample was collected from ear vein by using heparinized tubes, then the blood samples were centrifuged at 3000 rpm for 10 min to obtain plasma and stored at -20°C until the analysis. The testosterone and Immunoglobulin concentration were determined by using ELISA assay .

Statistical analysis:-

The result was analyzed by using the statistical software package SPSS 23. The probability of (P≤ 0.05) was considered in statistically significant.

Results and Discussion

The results of table one show the that the some semen quality parameters give significant results ,but the volume of ejaculation slightly increased by RJ feed and not give significant results, the explanation of the slightly increased may be due to increase in testosterone concentration due to RJ feed. RJ increase the spermatogenesis and that lead to increase sperm concentration and this agreed with Kohguchi et al., (2004) Kamel *et al.* (2009), .The sperm motility and sperm live also give a significant result according RJ concentration feed that associated with hydrogen ion in seminal plasma .

Table 1 :- Semen quality after royal jelly feed.

Parameter group	Royal jelly concentration (mg /kg)				P. value
	0	100	200	300	
Volume of ejaculation	0.70	0.721	0.740	0.742	P<0.2
Sperm concentration	450	530	554	570	P<0.05
Total motile sperm	170	252	254	280	P<0.05
Sperm motility	56.1	62.2	72.6	91.5	P<0.05
A live sperm	87.4	90.5	92.4	93.6	P<0.05
Dead sperm	12.6	9.5	7.6	6.4	P<0.05

In the table 2 the testosterone give statically significant difference among groups and this result agreed with Kohguchi *et al.* shown RJ diet excited higher testosterone content and better spermatogenesis in hamster testis (Kohguchi et al,2004).In another study performed on rabbits in Egypt by Elnagar, spermogram parameters were significantly improved and serum testosterone levels increased in heat stressed male rabbits after consumption of Royal Jelly(Elnagar SA,2012).the rats received RJ were significantly (P<0.05) increased the immunoglobulin IgG, IgM and IgA levels specially in heat-stressed rabbits .Like Elnagar *et al.* (2010) found that rate received RJ increased in IgG and IgM levels in heat-stressed growing rabbits. Yamada *et al.* (1990)and Hasan (2015) are found when give substances known to have Igs production stimulating factor activity like RJ and then examined on lymph node lymphocytes from breast cancer patients the IgM concentration was increased until 2 to 3 time. The IgM and IgG play role in pathogenesis of certain disease specially autoimmune disease like rheumatoid arthritis and royal jelly may reduce these effect Hasan (2015)

Table 2:-Biochemical and immunological parameters of semen.

Parameter group	Royal jelly concentration (mg /kg)				P. value
	0	100	200	300	
Testosterone(ng /ml)	0.501	0.611	0.742	0.781	P<0.05

IgM (mg/dl)	1.01	1.34	1.46	1.54	P<0.05
IgG(mg/dl)	2.99	3.23	4.72	5.31	P<0.05
IgA(mg/dl)	0.23	0.49	0.54	0.59	P<0.05
Lysozyme(mmol/ml)	90.3	81.1	71.3	60.5	P<0.05

Conclusion

The quality of semen parameters increased due to royal jelly consumption especially the sperm concentration and motility ,RJ have characteristic that increase testosterone levels and give good immunity that lead to increase fertility in rats males . These effects would be useful for infertile men who have low sperm count and weak sperm motility to help them for fertility.

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