Available online on www.ijcpr.com
International Journal of Current Pharmaceutical Review and Research; 8(2); 134-140
doi: 10.25258/ijcprr.v8i02.9197
ISSN: 0976 822X

Research Article

Effect of Sesame Oil on Male Rats Treated with Acrylamide in some Physiological and Hormonal Blood Criteria

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Available Online: 25th April, 2017

ABSTRACT
Sesame oil, natural foods rich in active compounds that have been used since ancient times and popular tradition for the treatment of many diseases. Used in the current study, 64 male rats to determine the effect of sesame oil affordable doses of 0.5, 1, and 2 ml divided into 8 groups. The first group as positive control was no treatment for the purpose of controlling with second group was treated material acrylamide as a negative control for the purpose of comparison with the third, fourth and fifth treatment groups textured acrylamide , sesame oil, while the sixth, seventh and eighth groups treated material only sesame oil. And showed the results of the current study significant effect on physiological blood criteria (RBC, WBC, LYM, MONO, GRANO) and hormonal (FSH, LH, Testosterone), as well as the weight of the genitals (Epididymis and testis) , the weight of total body and cells in spermatogenesis processing , especially when the dose of 2 ml when compared with the control. The study concluded that the possibility of the use of sesame oil in improving fertility in humans, especially those who suffer infertility and when eating sesame oil without the emergence of any side effects.

Keywords: sesame oil, blood criteria, male rats, acrylamide.

INTRODUCTION

The plant sesame medicinal plants widely used and popular tradition in the use of alternative medicine in the treatment of many diseases as possible to hurt and injure man on the one hand and on the other hand-energy food high and gives a pair of skin in luxury uses and which has been used since ancient times. Sesame seeds contain important plant compounds from a fixed rate of oil ranges between 41-63% and stop this oil ratio on the breed and the agriculture climate and other factors[1,2].

The seeds also contain proteins by 26% and increased by 12-13% sugars, minerals and vitamins and acids and other compounds where the acidic and acidic sesamin, sesamolin of the most important acids in seeds[3,2].

As a result, the cultivation of sesame (*Sesamum indicum*) which dates back to Pedalinacea family in different parts of the world has been used in the treatment of many diseases, such as gum and dental disease, laxative for the digestive system and relieve constipation and prevent atherosclerosis, the treatment of the sensitivity of the skin where used a guarantor for the skin from the blazing sun[4,5].

Since the sesame oil is one of the vehicles omega-3 fatty compounds unsaturated therefore considered an important treatment and tonic for memory and has benefits also on the level of sex for women and men. Has used sesame oil relieve pain vaginal dryness associated with menopause and increase the libido in men who ate the occasion of sesame oil with high amounts of energy[6,7].

Interest in studying the effect of chemicals in the gonads as well as increased and then in the fertility of laboratory animals and humans. And that many of these substances occur testicular degeneration and obstruction of the spermatogenesis process[8,9].

It is this material substance Acrylamide, one of the chemicals used in vitro, they are amorphous material, colorless, odorless and molecular weight of 71.09 and chemical form (CH2CHON). It is also a carcinogen and toxic to nerve cells, as well as causing damage to the eye, skin and respiratory system[10].

And because of the long exposure to this substance causes degeneration in the testes and cause also minimize the diameters of seminiferous tubule and damage in germ cells of spermatogenesis drop in the number of sperm cells and abnormalities in the head of the sperm. Therefore, the goal of research to know the effect of sesame oil dosage interoperability with the injection of Acrylamide in laboratory rats at the level of some of the blood criteria physiological and hormonal.

METHODOLOGY

Used in this study, rats white males ***Ratus ratus*** (n=64) in the Animal House of the Faculty of Science / University of Kufa. Where has to create the conditions of the laboratory of light (13 hour light / 11-hour darkness) and the degree of appropriate temperature 23-28 ° C and Nutrition (pellet) suitable. It was obtained on a sample sesame oil from the local markets of Pakistani-made products Hemani.

This experiment was designed to 8 groups and each group 8 animals to see three axes: the first axis, measuring the weights of the body weights of the genitals, second axis: Measuring some physiological blood criteria (WBC, RBC,

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Table 1 : Effect of sesame oil on body weight and the weight of the genitals in male albino rat treatment Acrylamide substance.

Parameters groups		Control (n=8)	Acrylamide only (n=8)		Acrylamide with sesame oil 0.5 ml (n=8)		1 ml (n=8)		2 ml (n=8)		Sesame oil only 0.5 ml (n=8)		1 ml (n=8)		2 ml (n=8)	
Body weight (g)	Mean	200.0	171.0	a	225.0	a b	223.8	a b	312.5	a b	263.1	a b	310.0	a b	320.0	abce
	SD	14.39	3.423		8.864		6.364		10.69	c	7.990	c	12.25	c	12.82	
	SE	5.089	1.210		3.134		2.250		3.780	d	2.825	d	4.330	e	4.532	
Testis weight (mg/100g B.W.)	Mean	378.1	321.8		461.8	a b	465.2	a	664.1	a b	552.8	a b	739.3	a b	1117	abcdefg
	SD	1.064	11.95		2.168		21.13	b	26.29	c	35.22	c	43.54	c	106.9	
	SE	0.3761	4.225		0.7666		7.471		9.295	d	12.45	d e	15.39	d e f	37.79	
Epididymis weight (mg/100g B.W.)	Mean	222	198	a	248	a b	266	a b	311	a b	249	a b	323	a b	340	abcdef
	SD	1.33	0.674		0.756		1.09	c	0.679	c	0.740	c	1.08	c	1.23	
	SE	0.471	0.238		0.267		0.386		0.240	d	0.262	d e	0.381	d e	0.435	
Diameter testicular tubes (µm)	Mean	10.75	9.530	a	11.70	a b	12.14	a b	12.13	a b	12.89	a b	13.31	a b	15.22	abcdef
	SD	0.02828	0.3093		0.1414		0.2821	c	0.1813	c	0.07434d	d	0.2850	c d	0.3923	
	SE	0.01000	0.1094		0.0500		0.0998		0.0641		0.0263		0.1008	e	0.1387	
Diameter Epididymis tubes (µm)	Mean	10.30	9.481	a	10.89	a b	10.89	a b	11.30	a b	11.54	a b	12.31	a b	12.89	abcdef
	SD	0.3489	0.2943		0.0831		0.1312		0.3829	c	0.1996	c	0.2357	c d	0.0641	
	SE	0.1234	0.1041		0.0294		0.0464		0.1354		0.0706		0.0833	e	0.0227	

Different latters are meaning significant difference ($p < 0.05$)

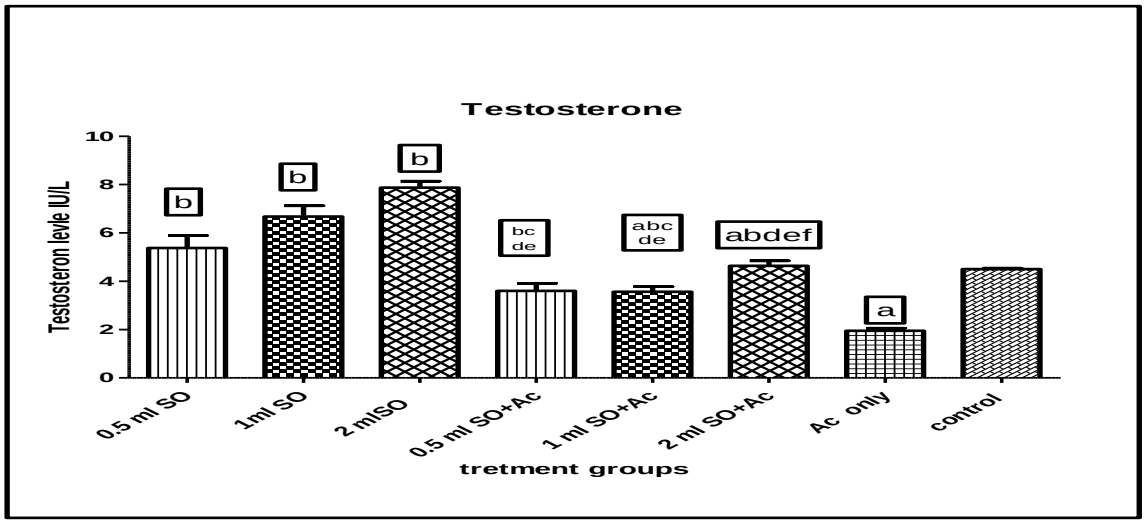

Figure 1: The effect of sesame oil on level Testosterone hormone in male albino rat treatment Acrylamide substance. (SO : sesame oil .; SO+Ac : sesame oil plus Acrylamide ; Ac only : Acrylamide only .; Different latters are meaning significant difference ($p < 0.05$) , n = 8 for each group).

GRA%, LYM%, MON%, PCV%, and MCH) and some hormonal blood criteria (FSH, LH, Testosterone). The third axis measure the diameter of the tubule where the sperm in the testis and epididymis and calculate the percentage of the number of spermatogenesis process cells (Spermatogonia, spermatocytes, spermatids and spermatozoa). The first three groups of animals given doses sesame oil all doses (0.5, 1, and 2) ml, respectively.

Table 2: The effect of sesame oil on blood physiological parameters in male albino rat treatment Acrylamide substance.

Parameters Groups		Control (n=8)	Acrylamide only (n=8)	Acrylamide with sesame oil 0.5 ml (n=8)	1 ml (n=8)	2 ml (n=8)	Sesame oil only 0.5 ml (n=8)	1 ml (n=8)	2 ml (n=8)	
RBC (x 106 cell/ml)	Mean	9.478	9.553	9.938 a	10.23 ab	10.84 ab	10.10 ab	11.03 ab	9.938 abc	def
	SD	0.4500	0.0595	0.3926	0.1669	0.1061 cd	0.0775 e	0.3711 cd	0.3926	
	SE	0.1591	0.0210	0.1388	0.0590	0.0375	0.0274	0.1312 f	0.1388	
WBC (x 105 cell/ml)	Mean	5.129	28.00 a	16.73 ab	16.04 ab	15.36 ab	13.09 ab	14.59 ab	15.01 ab	
	SD	0.8827	1.965	1.142	0.4031	0.3084	0.6002 cd	0.4400 cd	0.2009	cf
	SE	0.3121	0.6946	0.4039	0.1425	0.1090	0.2122 e	0.1556 f	0.0710	
LYM %	Mean	22.4	55.6 a	39.4 ab	40.3 ab	51.1 ab	26.4 ab	28.3 ab	31.4	abc def
	SD	0.385	1.27	0.288	0.316 c	0.146 c	0.278 c	0.454 c	0.381	g
	SE	0.136	0.448	0.102	0.112	0.0515 d	0.0982 de	0.160 def	0.135	
MON %	Mean	11.19	13.93 a	13.63 a	14.63 a	16.06 ab	14.87 ab	19.37 ac	21.96	acd efg
	SD	0.8326	2.493	0.2659	0.3012	0.5807 c	0.1994	0.3403 de	1.433	
	SE	0.2944	0.8813	0.0940	0.1065	0.2053	0.0705	0.1203 f	0.5067	
GRNO %	Mean	65.98	26.60 a	51.28 ab	47.65 ab	47.81 ab	50.33 ab	52.09 ab	54.21	abc d
	SD	0.1282	0.4000	0.5036	0.6118	11.25	0.2866	0.4454	0.09910	
	SE	0.04532	0.1414	0.1780	0.2163	3.976	0.1013	0.1575	0.03504	
PCV %	Mean	37.85	39.75 a	37.34	37.74	38.20 a	37.40 b	37.99	37.34	b
	SD	0.2330	0.1604	0.3159	0.4274	0.3423	0.2268	0.1126	0.2875	
	SE	0.08238	0.05670	0.1117	0.1511	0.1210	0.08018	0.03981	0.1017	
MCH (pg)	Mean	40.58	18.08	19.11	18.15	19.08	18.71	18.99	19.08	
	SD	60.78	0.1035	0.9403	0.1195	0.5230	0.4390	0.470	0.673	
	SE	21.49	0.0366	0.3324	0.042	0.1849	0.1552	0.163	0.231	

Different latters are meaning significant difference ($p < 0.05$)

While second three groups sesame oil given doses (same doses) plus a dose of infertility- causing acrylamides 0. 5 ml. The two latter groups were seventh and eighth were negative and the positive control where laboratory animals were given infertility- causing acrylamides only as a negative while the latter were given normal saline solution as a positive control. And it worked all groups in the same laboratory conditions for a period of 54 days and daily doses with day rest. Results were analyzed statistically using Graph Pad prism 5 program appoint the arithmetic mean value and standard errors and standard deviation and test the significance treatment groups used one-way ANOVA analysis of variance Tukey : compare all pairs of columns ($p < 0.5$, 95% confidence intervals).

RESULTS

The present study results showed significant differences ($P < 0.05$) evident in experimental animals and in particular treatment sesame oil and 2 ml range when all the rest of the transaction and for all the studied parameters, as illustrated in the tables and figures 1,2,3. Results did not show any significant difference ($P > 0.05$) in all the test animals when measuring the level of MCH (pg) as specified by Table 2 when compared with the control

Table 3: The effect of sesame oil on cells percentage of spermatogenesis in male albino rat treatment Acrylamide substance.

Parameters Groups		Control (n=8)	Acrylamide only (n=8)	Acrylamide with sesame oil 0.5 ml (n=8)	1 ml (n=8)	2 ml (n=8)	Sesame oil only 0.5 ml (n=8)	1 ml (n=8)	2 ml (n=8)	
Spermatogonia %	Mean	11.63	11.13	12.25	15.88 ab	21.63 ab	12.75 de	21.88 ab	25.88	abcdefg
	SD	1.408	0.835	1.035	2.167 c	1.408 c	1.389	1.808 c	2.031	
	SE	0.4978	0.295	0.366	0.766	0.498 d	0.491	0.639 df	0.718	
Spermatocytes %	Mean	15.63	13.25 a	15.75 b	22.00 ab	22.00 ab	20.88 ab	23.63 ab	26.50	ab cdefg
	SD	0.9161	1.035	0.886	1.195 c	1.195 c	1.126 c	0.916 c	1.927	
	SE	0.3239	0.366	0.313	0.423	0.423	0.398	0.324 f	0.681	
Spermatids%	Mean	29.63	29.63	32.38	37.38	32.75	40.75 ab	35.63	47.38	abcde
	SD	1.847	3.068	3.420	4.274	6.182	9.662	5.854	11.72	
	SE	0.6529	1.085	1.209	1.511	2.186	3.416	2.070	4.144	
Spermatozoa %	Mean	33.25	30.13	32.38	37.38	32.75	39.50 b	40.63 b	59.38	abcdefg
	SD	1.832	1.246	3.420	4.274	6.182	10.62	5.854	6.232	
	SE	0.6478	0.4407	1.209	1.511	2.186	3.756	2.070	2.203	

Different latters are meaning significant difference ($p < 0.05$).

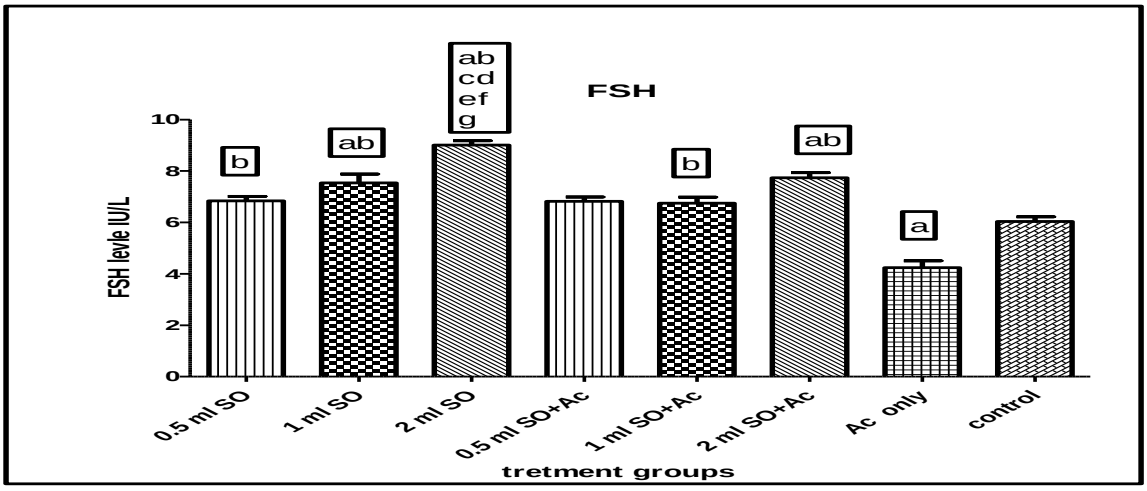

Figure 2: The effect of sesame oil on FSH level in male albino rat treatment Acrylamide substance. (SO : sesame oil .; SO+Ac : sesame oil plus Acrylamide ; Ac only : Acrylamide only .; Different latters are meaning significant difference ($p < 0.05$) , n = 8 for each group).

group.

DISCUSSION

The effect of dosage sesame oil on the total body weight and the weight of the genitals to the male albino rats. Notes from Figure 3 having represented significant difference upwardly moral ($p < 0.05$) in the animals, the dosage for animals control of male albino rats, and that could explain the increase in body weight to efficiency potential androgenic sesame oil consisting of fatty acids unsaturated such as Oleic acid and linoleic acid[11] and which may increase the effectiveness of the hormones no steroidal particularly effective hormonal such as thyroid and growth hormones and who are an important factor in increasing body weight by stimulating the basal metabolism rate[12,13].

The significantly increased ($p < 0.05$) in the testis weight when male albino rats drank sesame oil, which is illustrated in Figure 4 can be interpreted based on the simultaneous measurement of hormone levels increase testicular Testosterone, which may lead to increased discrimination for Leydig cells stimulated by the increase LH and thus an increase in testicular weight[14,15]. The significantly increased ($p < 0.05$) that took place in the epididymis weight may also be possible to explain the sesame oil that doses of the experimental animals worked to increase the number of protein receptors specific to the hormone testosterone, which leads to the user's response and then an increase in the weight of the epididymis[16,7]. These increases were also observed in the pictures, which showed a significant increase in tubule diameter sperm in

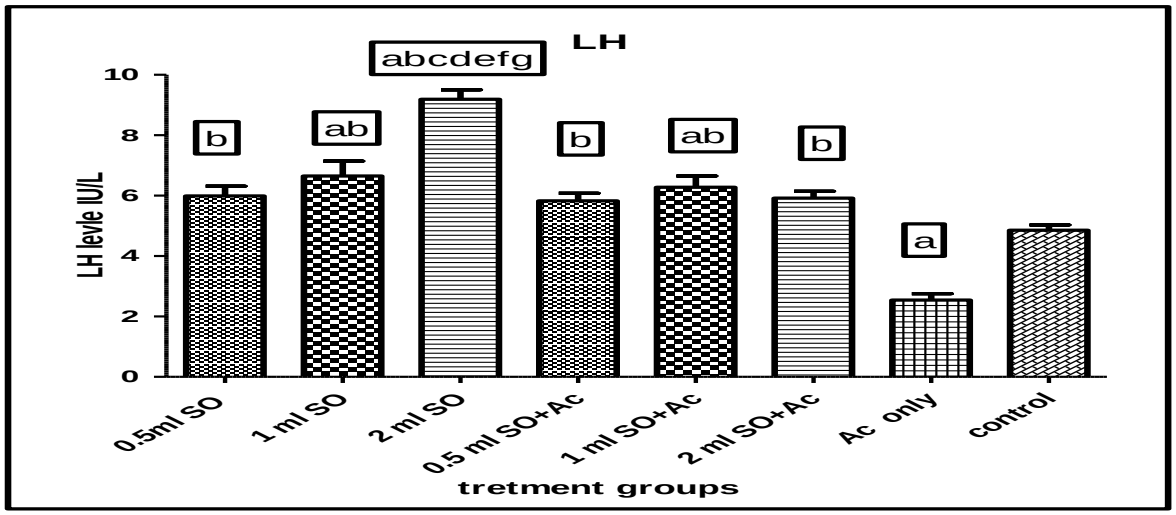

Figure 3: The effect of sesame oil on LH level in male albino rat treatment Acrylamide substance. (SO : sesame oil .; SO+Ac : sesame oil plus Acrylamide ; Ac only : Acrylamide only .; Different latters are meaning significant difference ($p < 0.05$) , n = 8 for each group).

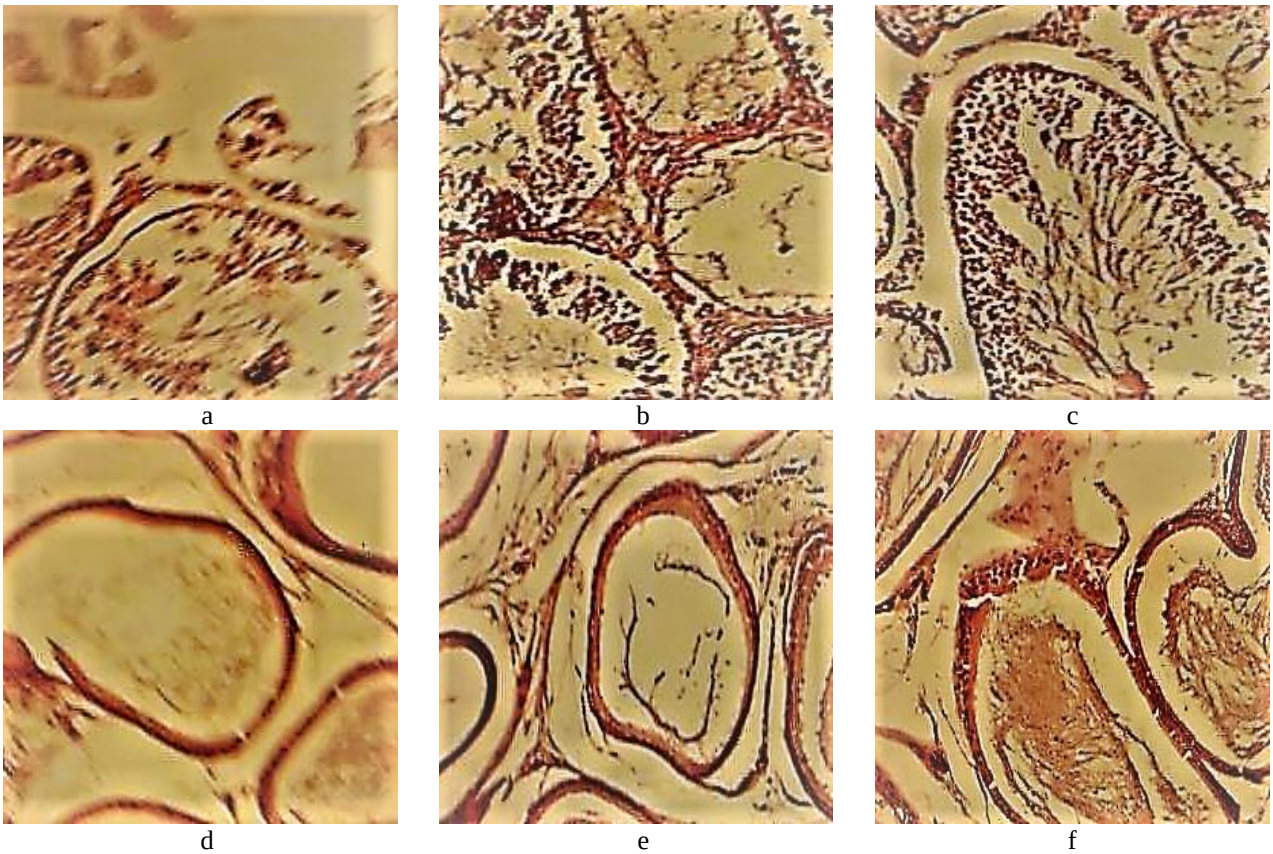

Figure 4 : Showing the photomicrographs in male albino rat treatment Acrylamide substance with effect of sesame oil on spermatogenesis processing in reproductive organs (testis and epididymis: a-d control , b- e - acrylamide, c-f sesame oil 2 ml)400x.

the testis and epididymis treatments when compared with the control group. Results from the current study, the significant increase taking place in the WBC and RBC and PCV. It coincided with the result of Victor U. Nna et al[18]. This means that the sesame oil works to enhance erythropoiesis[17,9]. Changes in the hormonal level of increase LH and Testosterone in the current study is the result of sesame oil to contain the acid compounds unsaturated fatty which is possible to affect the internal balance of the synthesis of hormones, whether steroidal or peptide . This is the part of the other hand, the increase occurring in the testis and epididymis weight in the current

study may be the second increase in the number of Leydig` cells that produce the hormone Testosterone due to higher hormone LH guide[7,19]. Because of what is in sesame oil from the effective compounds may lead to higher protein receptors or ligands and thus lead to a rise in the level of FSH and this has shown results of the current study[23]. But with regard to the moral decline is obvious in the treatment group of animals textured Acrylamide hormonal blood parameters and weights of the genitals, which explained the results of the current study may be due to a degeneration of germ cells, which reduces the weights of the genitals and the level of hormonal blood parameters LH, FSH , and testosterone[20,21]. Although the use of materials degeneration of germ cells (Spermatogonia ,spermatocyte, spermatide, and spermatozoa), but the concentrations of sesame oil returned aggregates animal treatment to a natural state and groups that took only sesame oil resulted in a significant improvement in all the parameters studied. This effect is possible to return to the direct effect on the brain through the pituitary – hypothalamus axis . In stimulating the secretion of hormones liberated Gonadotropin Releasing Hormones (GnRH)[22]. We conclude from the current study that the use of sesame oil can improve the synthesis of sex hormones and increases in the process of spermatogenesis and it can be advised to use this oil to treat some cases of male infertility

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