RESULTS

In this study : we study the effects of thyroid hormone on testicular function through induction of hypo- and hyperthyroidism in adult male rats, the following was noticed

Effect of propyl-thiouracil on serum T4 level

Table (1) shows the serum T4 level in rats receiving propylthiouracil 0.1% for 2 weeks compared with the control group. In which the mean value of serum T4 in the control group is 75 ± 7.238 ng/ml. Mean value in A1 group is 51.546 ± 3.281 ng/ml, it shows significant decrease compared with control group P value < 0.01. It also shows serum T4 level in rats receiving propylthiouracil 0.1% for 4 weeks compared with the control group. In which the mean value of serum T4 in the control group is 75 ± 7.238 ng/ml. Mean value in A2 group is 43.083 ± 4.352 ng/ml, it shows significant decrease compared with control group P value < 0.001. Table (1) shows serum T4 level in rats receiving propylthiouracil 0.1% for 8 weeks compared with the control group. In which the mean value of serum T4 in the control group is 75 ± 7.238 ng/ml. Mean value in A3 group is 37.666 ± 13.952 ng/ml, it shows significant decrease compared with control group P value < 0.01.

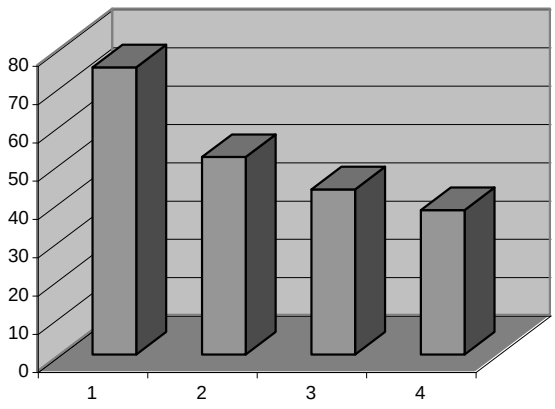
On conclution, propylthiouracil 0.1% administration in adult male rats cause significant decrease in serum T4 level (induced hypothyroidism) after 2,4 and 8 weeks and this appears in chart (1).

Table (1): serum T4 level ng/ml in rats receiving propylthiouracil 0.1% for 2, 4, and8 weeks compared with the control group

Group		Control	A1	A2	A3
serum T4 level	1	65	47.78	42.5	35
	2	76	53	49	13
	3	69	50.5	40.5	37
	4	75	55	44	43
	5	85	48	36.5	55
	6	80	55	46	43
	MEAN	75	51.546	43.083	37.666
	S.D	7.238	3.281	4.352	13.952
	P Value	__	<0.01	<0.001	<0.01

SD: standerd deviation
P :significant difference compared with the control group
A1 : rats receiving PTU for 2 wks.
A2 : rats receiving PTU for 4 wks.
A3 : rats receiving PTU for 8 wks.

chart 1: T4 level in ng/ml in rats receiving propylthiouracil for 2,4 and 8 weeks compared with the control group



Effect of thyroxine injection on serum T4 level

Table (2) shows the serum T4 level in rats receiving thyroxine injection at a dose 100 µg/kg/d for 2 weeks compared with the control group. In which the mean value of serum T4 in the control group is 75 ± 7.238 ng/ml. Mean value in B1 group is 113.833 ± 13.496 ng/ml, it shows significant increase compared with control group P value < 0.01.It also shows the serum T4 level in rats receiving thyroxine injection at a dose 100 µg/kg/d for 4 weeks compared with the control group. In which the mean value of serum T4 in the control group is 75 ± 7.238 ng/ml. Mean value in B1 group is 109.666 ± 25.943ng/ml, it shows significant increase compared with control group P value < 0.05 .In this table the serum T4 level in rats receiving thyroxine injection at a dose 100 µg/kg/d for 8 weeks compared with the control group. In which the mean value of serum T4 in the control group is 75 ± 7.238 ng/ml. Mean value in B1 group is 149.833 ± 31.663 ng/ml, it shows significant increase compared with control group P value < 0.01 .

On conclution, thyroxine administration in adult male rats at a dose 100 µg/kg/d cause significant increase in serum T4 level (induced hyperthyroidism) after 2,4 and 8 weeks , and this appears in chart (2).

Table (2): serum T4 level ng/ml in rats receiving thyroxine for 2, 4, and8 weeks compared with the control group

Group		Control	B1	B2	B3
Testicular Weight	1	65	104	89	168
	2	76	127	90	136
	3	69	95	128	132
	4	75	128	99	182
	5	85	108	154	179
	6	80	121	98	102
	MEAN	75	113.833	109.666	149.833
	S.D	7.238	13.496	25.943	31.663
	P Value	__	<0.01	<0.05	<0.01

SD: standerd deviation

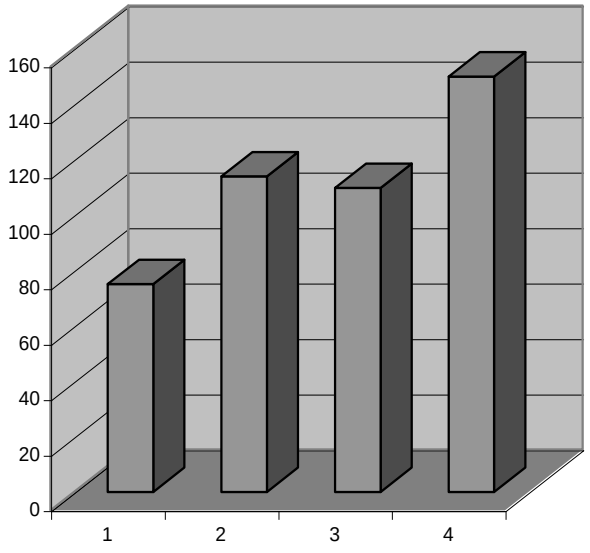
P :significant difference compared with the control group

B1: rats receiving thyroxine for 2 wks.

B2: rats receiving thyroxine for 4 wks.

B3: rats receiving thyroxine for 8 wks.

chart 2: T4 level in ng/ml in rats receiving thyroxine for 2,4 and 8weeks compared with the control group



Effect of hypothyroidism on testicular weight :

Table (3): show the changes the total testicular weight in rats receiving propyl-thiouracil (PTU) for 2,4,and 8weeks compared with the control group. From this table the control group shows mean value 2.04777 ± 0.6019 gm. Rats receiving (PTU) for 2 weeks (A1) shows mean value of testicular weight 1.8162± 0.1648 gm. This group shows no significant difference compared with the control group . The second group (A2) which received (PTU) for 4weeks shows mean value of testicular weight 2.435 ± 0.5737 gm. with no significant difference compared with the control group. The third group (A3) which received (PTU) for 8 weeks shows mean value of testicular weight 2.1568 ± 0.3349 gm. This group shows no significant difference compared with the control .

This table shows that there was no significant difference in testicular weight of the adult male rats in groups A1, A2 and A3 compared with the control group.

This comparison appear in chart(3),from which **We concluded that** there was no significant difference of the testicular weight after propylthiouracil administration in the periods 2,4 and 8 weeks compared with the control group in adult male rats.

Table (3): testicular weight in grams in rats receiving propylthiouracil 0.1% for 2, 4, and8 weeks compared with the control group

Group		Control	A1	A2	A3
Testicular Weight	**1**	2.36	1.65	2.52	2.01
	2	2.65	1.72	2.7	2.11
	3	1.83	1.79	3.38	2.77
	4	2.62	1.8	2.3	2.25
	5	1.71	2.13	1.87	2.01
	6	1.12	1.8	1.85	1.8
	MEAN	2.0477	1.8162	2.435	2.1568
	S.D	0.6019	0.1648	0.5737	0.3349
	P0 Value	——	Ns	Ns	Ns
	P1 Value	——	___	Ns	————
	P2 Value	——	___	——	Ns
	P3 Value	——	——	___	Ns

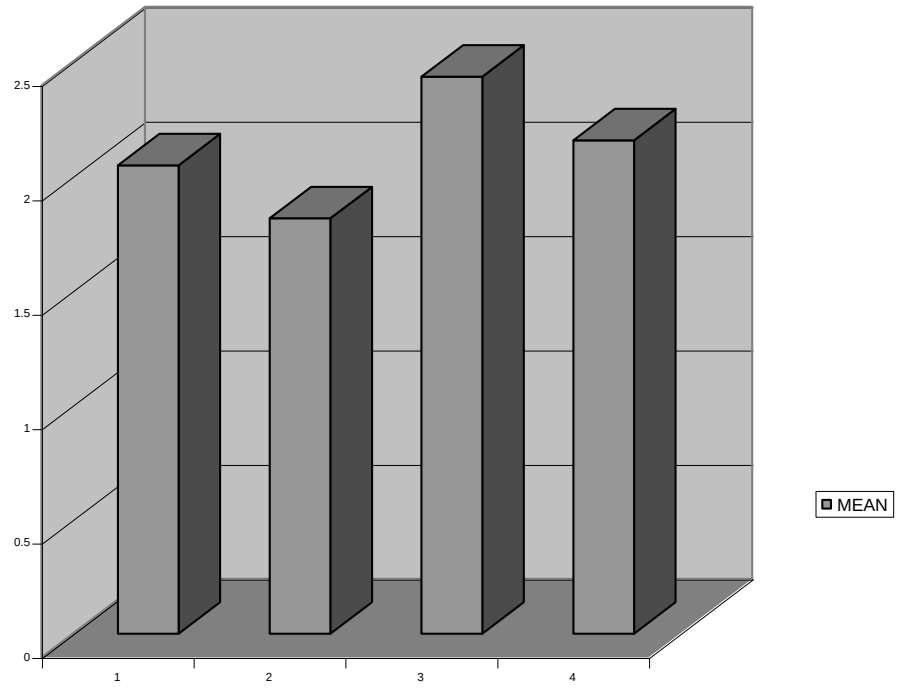
P0: Significant difference between the group and the control group

P1: Significant difference between A1 and A2

P2: Significant difference between A1 and A3

P3: Significant difference between A2 and A3

chart (3): testicular weight in grams in rats receiving propylthiouracil 0.1% for 2, 4, and8 weeks compared with the control group



Effect of hyperthyroidism on testicular weight

Table (4): shows changes in testicular weight after Thyroxine treatment at a dose 100 µg/kg/d. for 2,4 and 8 weeks compared with the control group. The mean value of testicular weight in control group is 2.0477±0.6019 gm. In group (B1) that received Thyroxine for 2 weeks the mean value of testicular weight is 1.7757 ± 0.2024. There was no significant decrease of testicular weight in B1 compared with the control. Group (B2) which received Thyroxine for 4 weeks shows mean value of testicular weight 1.5318 ± 0.3967 gm, and shows no significant decrease in testicular weight compared with the control group . The mean value in (B3) which received Thyroxine for 8 weeks is 2.1127 ± 0.2429 gm. It shows no significant decrease compared with the control. Chart (4) shows changes in testicular weight in hyperthyroid group of rats compared with the control group. **On conclusion** there was no significant effect of hyperthyroidism induced by thyroxine injection for 2,4, and 8 weeks on the testicular weight of the adult male rats, as shown in chart (4).

Table (4): Testicular weight in grams in rats receiving thyroxine for 2, 4, and 8 weeks compared with the control group

Group		Control	B1	B2	B3
Testicular Weight	**1**	2.36	1.93	1.07	1.9
	2	2.65	2.02	1.42	2.28
	3	1.83	1.46	1.36	2.31
	4	2.62	1.64	2.21	1.75
	5	1.71	1.78	1.38	2.34
	6	1.12	1.84	1.75	2.1
	MEAN	2.0477	1.7757	1.5318	2.1127
	S.D	0.6019	0.2024	0.3967	0.2429
	P0 Value	——	Ns	Ns	Ns
	P1 Value	——	___	Ns	——
	P2 Value	——	___	——	Ns
	P3 Value	——	——	___	Ns

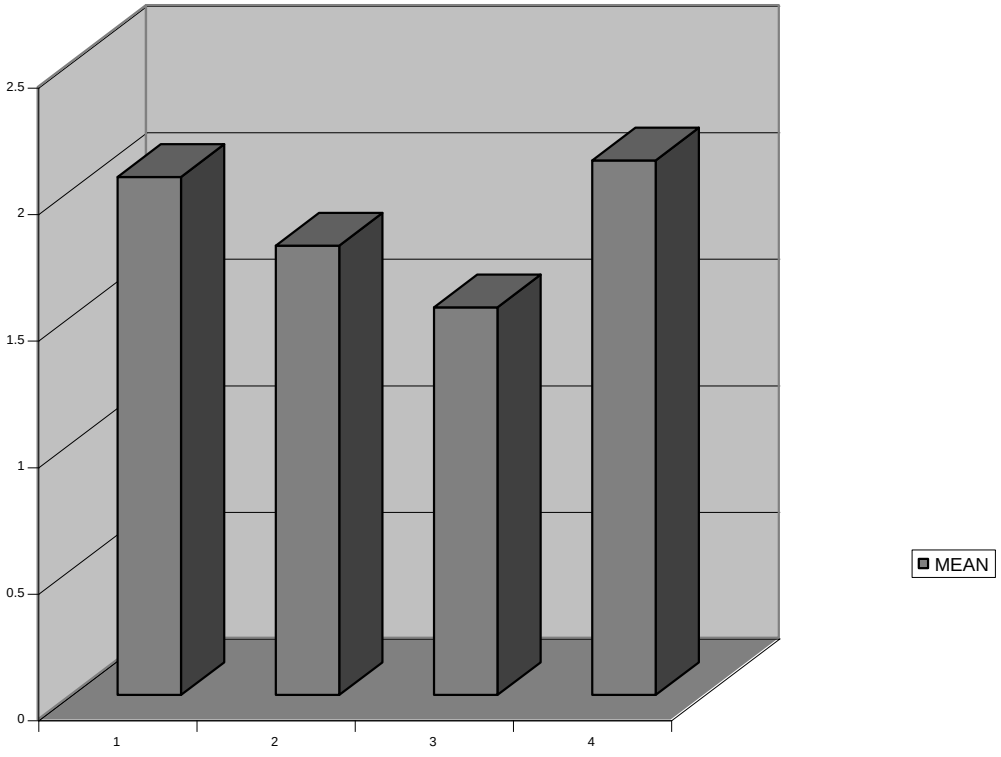
P0: Significant difference between the group and the control group.

P1: Significant difference between B1 and B2.

P2: Significant difference between B1 and B3.

P3: Significant difference between B2 and B3.

chart 4: testicular weight in rats receiving thyrxine for 2, 4, and8 weeks compared with the control group



Effect of hypothyroidism on sperm count:

Table (5) shows sperm count in (million/ml) control and rats receiving (PTU) 0.1% for 2, 4 and 8 weeks. The mean of the control group is 94.6667 ± 13.5892 million / ml. A1 shows mean value of sperm count 86.5 ± 5.4681 million / ml. It shows no significant decrease compared with the control group and no significant difference compared with A2 but shows significant difference compared with A3 $P < 0.05$. A2 mean value is 82.3333 ± 16.5731 million/ ml. It is significantly lower than the control group $P < 0.05$. A2 shows significant difference compared with the control group $p < 0.05$ and no significant decrease compared with A1 but shows significant difference compared with A3 $P < o.o5$. The mean value of sperm count in A3 is 64.3333 ± 8.641 million / ml. This group shows significant decrease compared with the control group $P < 0.05$. A3 shows significant decrease compared with A1 $P < 0.05$ and significant decrease compared with A2 $p < 0.05$. These changes appear in chart (5). From the above we concluded that sperm count shows significant decrease in adult male rats after induction of hypothyroidism by propyl-thiouracil 0.1% for 2,4 and 8weeks compared with the control. This decrease starts after 4 wks and become more in group A3 (after 8 wks) as it shows significant decrease compared with both A1 and A2 groups. So that the effect of hypothyroidism on sperm count of the adult male rats increases with time. **On conclusion** there was significant decrease of sperm count after administration of propylthiouracil for 2,4, and 8 weeks of the adult male rats, as shown in chart(5). This effect increase with the time of administration

Table (5): sperm count in millions in rats receiving propylthiouracil 0.1% for 2, 4, and8 weeks compared with the control group

Group		Control	A1	A2	A3
Sperm Count	**1**	110	85	105	75
	2	107	90	100	60
	3	75	95	70	50
	4	84	82	64	70
	5	92	80	80	65
	6	100	87	75	66
	MEAN	94.6667	86.5	82.3333	64.3333
	S.D	13.5892	5.4681	16.5731	8.641
	P0 Value	——	NS	<0.05	<0.05
	P1 Value	——	___	NS	___
	P2 Value	——	___	——	<0.05
	P3 Value	——	——	___	<0.05

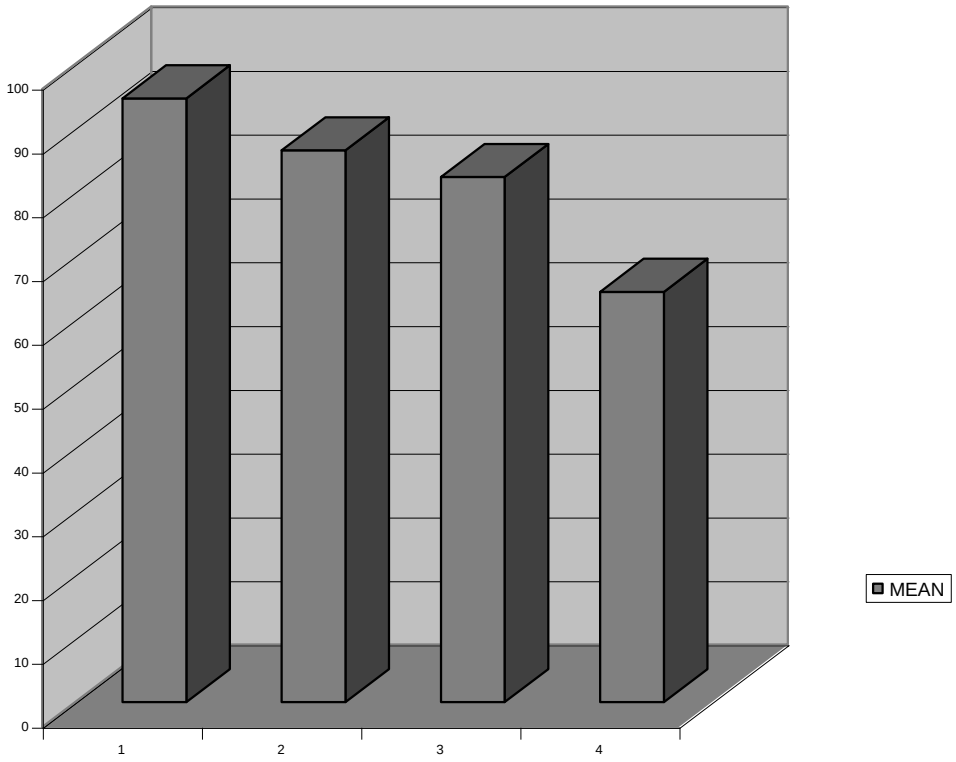
P0: Significant difference between the group and the control group

P1: Significant difference between A1 and A2

P2: Significant difference between A1 and A3

P3: Significant difference between A2 and A3

chart 5: sperm count in rats receiving propylthiouracil 0.1% for 2, 4, and8 weeks compared with the control group



Effect of hyperthyroidism on sperm count

Table (6) shows sperm count in (million/ml) rats receiving thyroxine injection at a dose 100 µg/kg/d. for 2,4 and 8 weeks compared with the control group. The mean value of sperm count in the control group is 94.667 ± 13.5892 million / ml. The mean value of B1 is 78.5 ± 18.4905 million / ml, it shows no significant difference compared with the control group. B2 shows mean value of sperm count 68.8333 ± 17.2907 million / ml, it is significantly lower than the control group $p < 0.05$, and it shows significant decrease compared with B1 $P<0.05$. B3 mean value of sperm count is 61 ± 7.4833 million / ml. it shows significant decrease compared with the control $p < 0.05$ and no significant decrease compared with B1 and B2 .So thyroxine at dose 100µg/kg/d. lowers sperm count in adult male rats compared with the control from 2 to8 weeks and become more effective at 4 weeks. This effect appears in chart (6). **On conclusion** there was significant decrease of sperm count after thyroxine administration for 2,4, and 8 weeks of the adult male rats, and this effect was maximum at 4weeks of administration.

Table (6): sperm count in millions/ ml in rats receiving thyroxine for 2, 4, and8 weeks compared with the control group

Group		Control	B1	B2	B3
Sperm Count	**1**	110	87	80	60
	2	107	108	86	65
	3	75	85	87	50
	4	84	59	57	70
	5	92	62	50	55
	6	100	70	53	66
	MEAN	94.6667	78.5	68.8333	61
	S.D	13.5892	18.4905	17.2907	7.4833
	P0 Value	__	NS	<0.05	<0.05
	P1 Value	__	__	<0.05	__
	P2 Value	__	__	__	NS
	P3 Value	__	__	__	NS

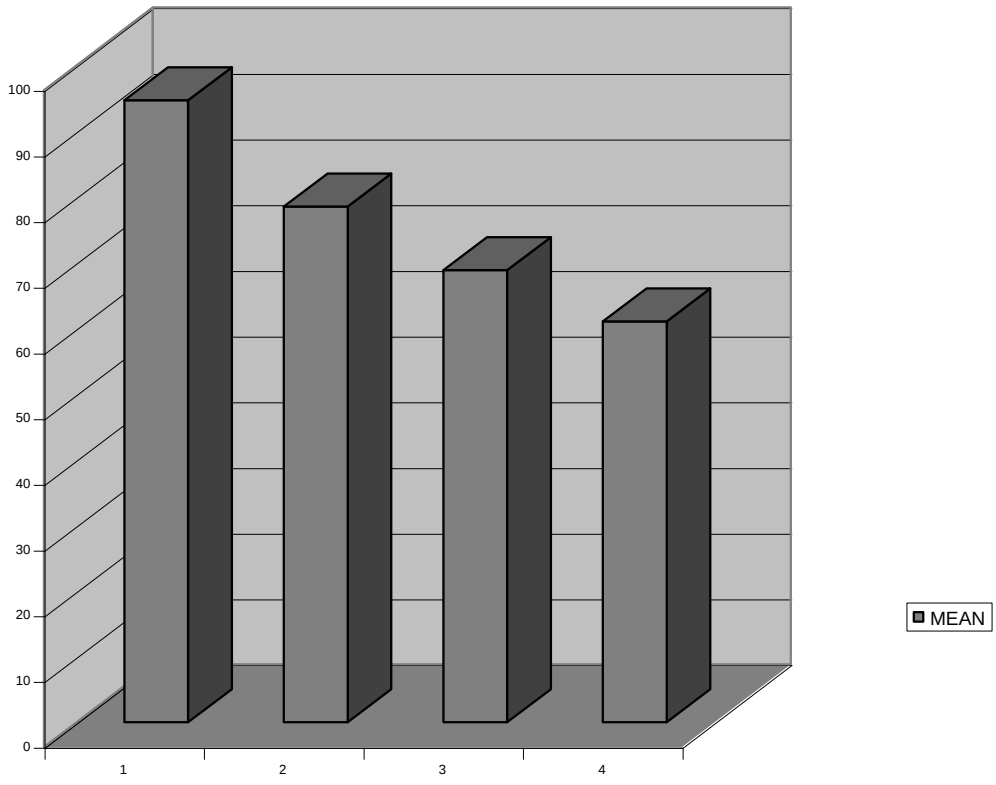
P0: Significant difference between the group and the control group

P1: Significant difference between B1 and B2

P2: Significant difference between B1 and B3

P3: Significant difference between B2 and B3

chart 6: sperm count inrats receiving thyroxine for 2, 4, and8 weeks compared with the control group



Effect of hypothyroidism on sperm motility:

Sperm motility percent in rats receiving (PTU) 0.01% for 2,4, and 8 weeks compared with the control group are shown in Table (7). The mean value of sperm motility in the control group is 59.1667 ± 5.8452 %. A1 mean value is 48.1667 ± 9.3684 % and it shows no significant difference compared with the control group. The mean value in A2 is 46.1667 ± 9.261 % and shows significant decrease compared with the control $p < 0.05$. A2 shows no significant decrease compared with A1 . The mean value in A3 is 34.5 ± 7.7136 % it is significantly lower than the control $p < 0.05$ and shows significant decrease compared with A1 $p < 0.05$ and with A2 $p < 0.05$. So that hypothyroidism causes decrease in sperm motility when induced for 4 and 8 weeks of adult male rats. This effect become more at 8 weeks .There is no significant effect of hypothyroidism on sperm motility at 2 weeks. these results can be shown in chart (7).

We concluded that there was no significant effect of hypothyroidism on sperm motility after 2weeks, but there was significant decrease in sperm motility after propyltiouracil administration for 4 and 8 weeks in adult male rats and this effect become more at 8 weeks.

Table (7): sperm motility in rats receiving propylthiouracil 0.1% for 2, 4, and8 weeks compared with the control group

Group		Control	A1	A2	A3
Sperm Motility	1	50	54	53	45
	2	65	43	62	30
	3	55	55	40	30
	4	60	60	42	42
	5	60	37	40	35
	6	65	40	40	25
	MEAN	59.1667	48.1667	46.1667	34.5
	S.D	5.8452	9.3684	9.261	7.7136
	P0 Value	—	NS	<0.05	<0.05
	P1 Value	—	—	NS	—
	P2 Value	—	—	—	<0.05
	P3 Value	—	—	—	<0.05

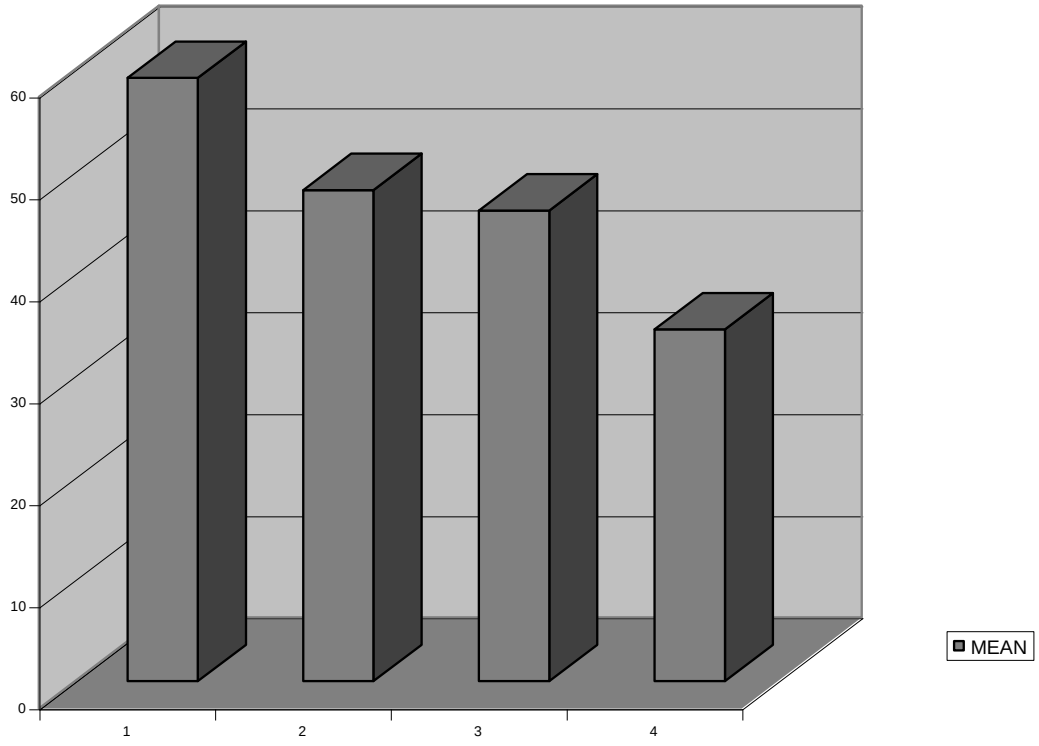
P0: Significant difference between the group and the control group

P1: Significant difference between A1 and A2

P2: Significant difference between A1 and A3

P3: Significant difference between A2 and A3

chart 7: sperm motility in rats receiving propylthiouracil 0.1% for 2, 4, and8 weeks compared with the control group



Effect of hyperthyroidism on sperm motility:

Sperm motility percent in rats receiving thyroxine at a dose 100 µg/kg/d. for 2,4, and 8 weeks compared with the control group are shown in Table (8). The mean value of sperm motility in the control group is 59.1667 ± 5.8452 %. B1 mean value is 48 ± 6.1644 % and it shows significant decrease compared with the control group $P< 0.05$. The mean value in B2 is 43.3333 ± 5.0465 % and shows significant decrease compared with the control $p < 0.05$. but shows no significant difference compared with B1. The mean value in B3 is 48.5 ± 4.8477 % it is significantly lower than the control $p < 0.05$ and shows no significant difference compared with B1 and B2 . Chart (8) shows the effect of hyperthyroidism on the percent sperm motility of adult male rats.

From the above **we concluded that** increased thyroxine level in adult male rat causes decrease in sperm motility when induced for 2, 4 and 8 weeks . This effect is not significantly changed by the time of thyroxine administration.

Table (8): sperm motility in rats receiving thyrxine for 2, 4, and8 weeks compared with the control group

Group		Control	B1	B2	B3
Sperm Motility	**1**	50	50	40	47
	2	65	45	45	56
	3	55	52	48	43
	4	60	40	44	44
	5	60	44	48	51
	6	65	57	35	50
	MEAN	59.1667	48	43.3333	48.5
	S.D	5.4852	6.1644	5.0465	4.8477
	P0 Value	—	<0.05	<0.05	<0.05
	P1 Value	—	—	NS	—
	P2 Value	—	—	—	NS
	P3 Value	—	—	—	NS

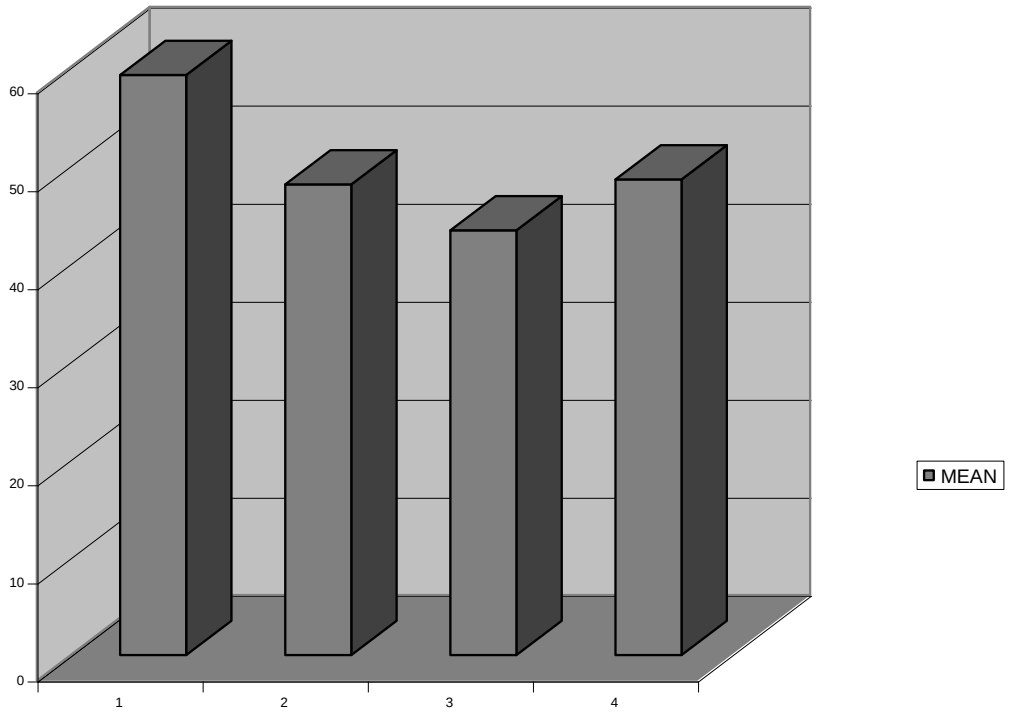
P0: Significant difference between the group and the control group

P1: Significant difference between B1 and B2

P2: Significant difference between B1 and B3

P3: Significant difference between B2 and B3

Chart 8: sperm motility in rats receiving thyroxine for 2, 4, and 8 weeks compared with the control group



Effect of hypothyroidism on sperm abnormalities:

Table (9) shows sperm abnormalities percent in rats receiving (PTU) 0.1% for 2,4 and 8 weeks compared with the control group. The mean value of the control group is 14.6667 ± 4.9666 %. (A1) mean value is 13.8333 ± 3.6009 %. it shows no significant difference compared with the control group. The mean value in (A2) is 15.5 ± 2.3452%, it shows no significant difference compared with the control group and no significant difference compared with (A1)group. The mean value of sperm abnormalities in (A3) is 24.1667 ± 2.4833 %. It is significantly higher than the control group $P < 0.05$, with significant increase compared with (A1) $p < 0.05$ and with (A2) $p < 0.05$. Chart (9) shows that hypothyroidim increase the ratio of sperm abnormalities when induced for 8 weeks compared with the control group . **On conclusion** there was no significant difference of sperm abnormalities after propylthiouracil administration for 2,4 weeks but there was significant increase in sperm abnormalities after 8 weeks in the adult male rats.

Table (9): sperm abnormalities in rats receiving propylthiouracil 0.1% for 2, 4, and8 weeks compared with the control group

Group		Control	A1	A2	A3
Sperm Abnormalities	**1**	23	18	14	24
	2	18	18	14	20
	3	14	14	20	23
	4	12	13	16	26
	5	11	10	15	27
	6	10	10	14	25
	MEAN	14.6667	13.8333	15.5	24.1667
	S.D	4.9666	3.6009	2.3452	2.4833
	P0 Value	—	NS	NS	<0.05
	P1 Value	—	—	NS	—
	P2 Value	—	—	—	<0.05
	P3 Value	—	—	—	<0.05

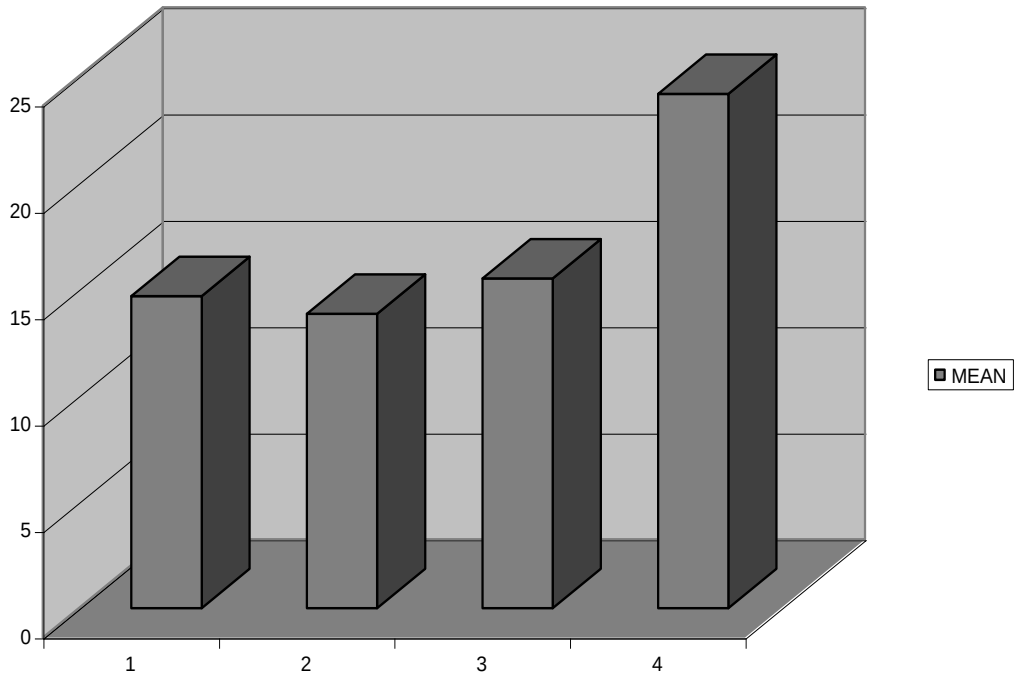
P0: Significant difference between the group and the control group

P1: Significant difference between A1 and A2

P2: Significant difference between A1 and A3

P3: Significant difference between A2 and A3

Chart 9: sperm abnormalities in rats receiving propylthiouracil 0.1% for 2, 4, and8 weeks compared with the control group



Effect of hyperthyroidism on sperm abnormalities:

Table (10) shows sperm abnormalities percent in rats receiving thyroxine injection at a dose 100 µg/kg/d. for 2,4 and 8 weeks compared with the control group. The mean value of the control group is 14.6667 ± 4.9666 %. (B1) mean value is 18.3333 ± 3.4448 %. It shows no significant difference compared with the control group. The mean value in (B2) is 15 ± 3.249 %, it shows no significant difference compared with the control group and no significant difference compared with (B1) group. The mean value of sperm abnormalities in (B3) is 20.3333 ± 5.2409 %. It is significantly higher than the control group $P < 0.05$. It shows no significant difference compared with (B1) group and (B2) groups. Chart (10) shows that hyperthyroidim increase the ratio of sperm abnormalities when induced for 8 weeks compared with the control group. Examples of these sperm abnormalities are shown in figure (11) in which there is budding and swelling of the acrosome, separation of the acrosome from the sperm head. Figure (12) shows normal acrosome with reflexed (bent) tail of sperm. Figure (13) shows damaged acrosome. Figure (14) shows acrosome entirely lost and abnormal midpiece of spermatozoa. **On conclusion** there was no significant difference of sperm abnormalities after thyroxine administration for 2,4weeks but there was significant increase in sperm abnormalities after 8 weeks in the adult male rats.

Table (10): sperm abnormalities in rats receiving thyroxine for 2, 4, and8 weeks compared with the control group

Group		Control	B1	B2	B3
Sperm Abnormalities	**1**	23	12	15	25
	2	18	18	14	17
	3	14	18	15	28
	4	12	20	10	20
	5	11	20	20	18
	6	10	22	16	14
	MEAN	14.6667	18.3333	15	20.3333
	S.D	4.9666	3.4448	3.2249	5.2409
	P0 Value	—	NS	NS	<0.05
	P1 Value	—	—	NS	—
	P2 Value	—	—	—	NS
	P3 Value	—	—	—	NS

P0: Significant difference between the group and the control group

P1: Significant difference between B1 and B2

P2: Significant difference between B1 and B3

P3: Significant difference between B2 and B3

Chart 10: sperm abnormality in rats receiving thyroxine for 2, 4, and8 weeks compared with the control group

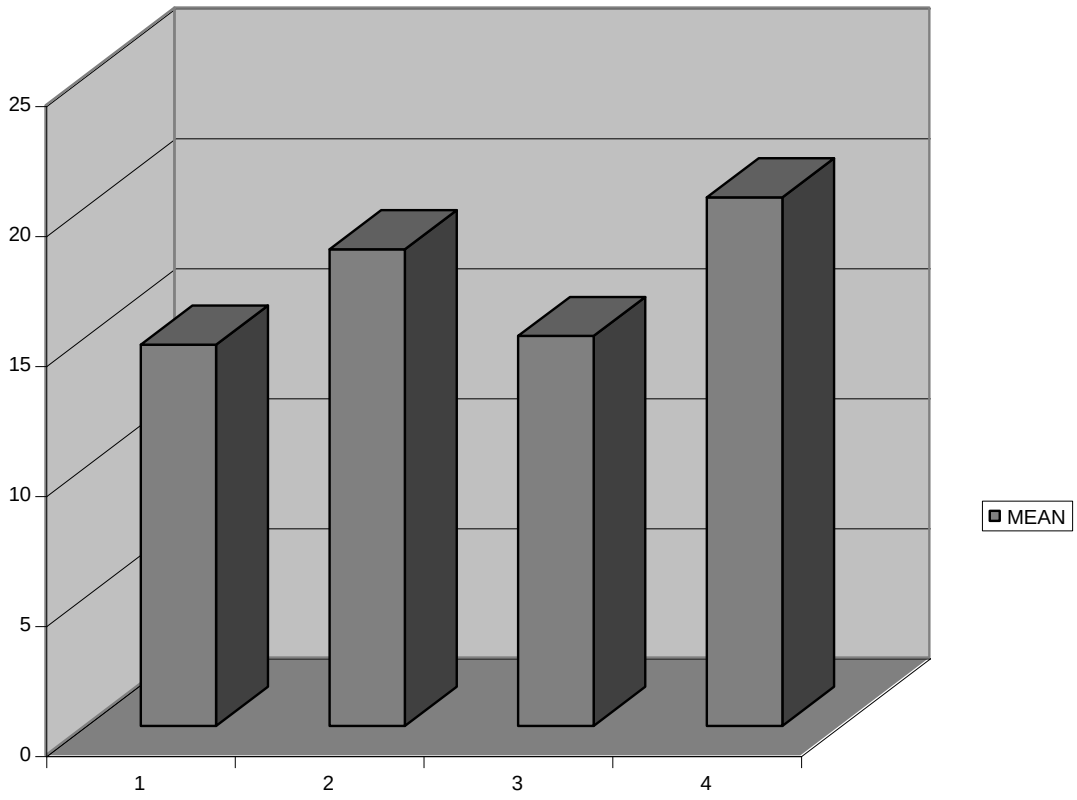


Fig. (11): a- budding and swelling of acrosome.
b-separation of acrosome from the head

Fig. (12): separation of acrosome from head of spermatozoa.

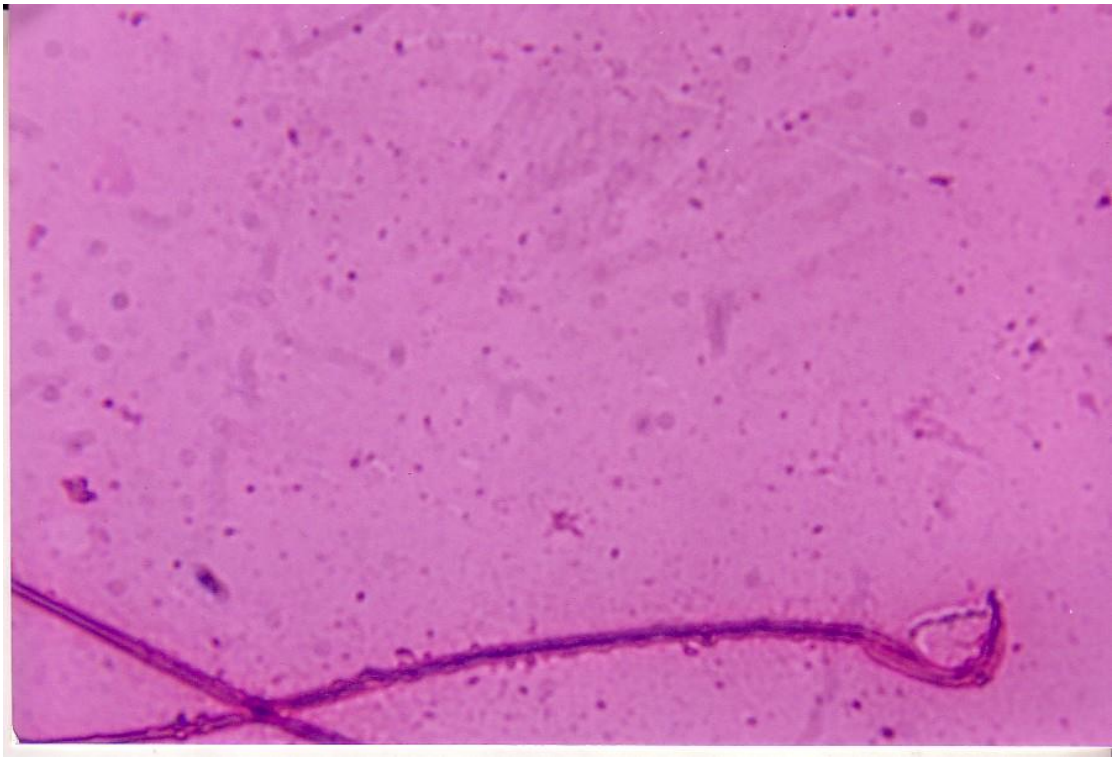


Fig (13): damaged acrosome.

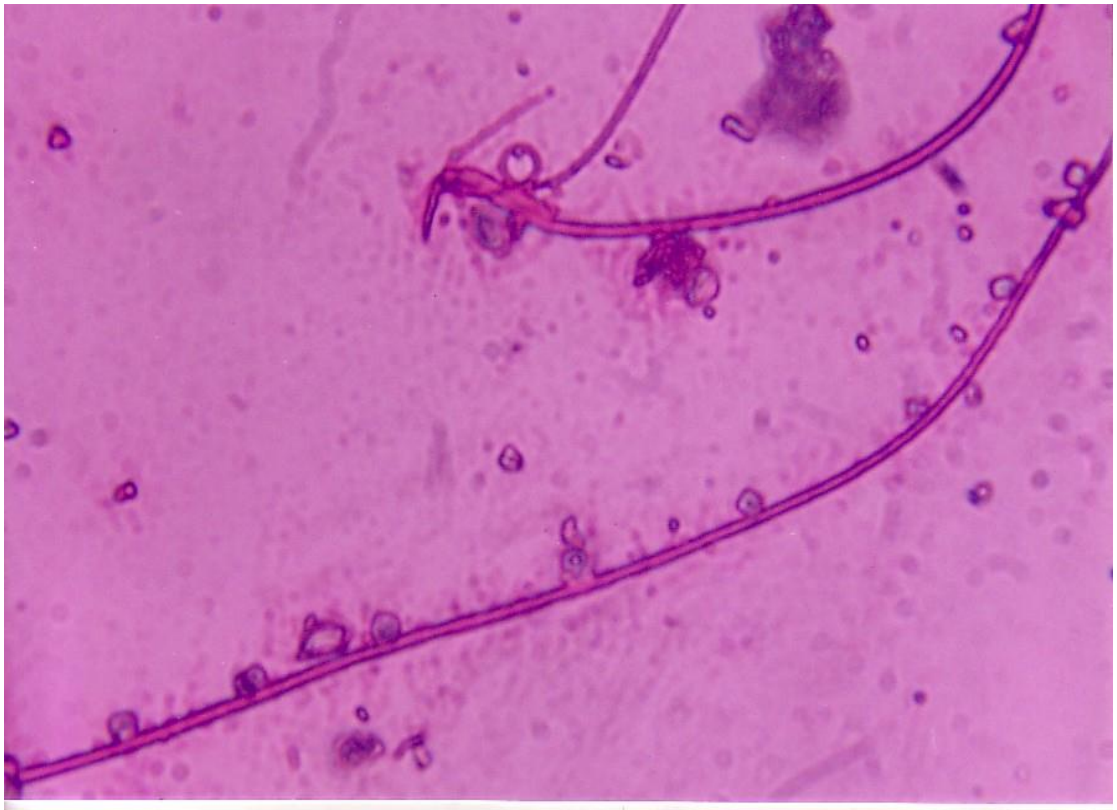


Fig. (14):acrosome entirely lost and abnormal midpiece of sperm

Fig. (15): normal acrosome with reflexed (bent) tail of sperm.

Effect of hypothyroidism on serum testosterone (ng/ml):

Table (11) &chart (11) shows the serum testosterone level in rats receiving (PTU) 0.1 % for 2,4 and 8 weeks compared with the control group. In which the mean value of serum testosterone in the control group is 1.8898 ± 1.0745 ng/ml. (A_1) mean value is 1.514 ± 1.6179 ng/ml, it shows no significant difference compared with control group. (A_2) mean value is 1.0633 ± 1.0682 ng/ml. it shows no significant difference compared with control and no significant difference compared with (A1). (A_3) mean value is 1.045 ± 0.6091. It shows significant decrease of serum testosterone level compared with the control group $p < 0.05$, with no significant difference compared with (A1) and (A2). Chart : (11) shows the decrease in the serum testosterone after (PTU) administration for 8 weeks. From the above **we concluded that** hypothyroidism causes no significant decrease in serum testosterone level when induced for 2 and 4 weeks, but it begins to cause significant decrease after 8 weeks.

Table (11): serum testosterone level in rats receiving propylthiouracil 0.1% for 2, 4, and8 weeks compared with the control group

Group		Control	A1	A2	A3
Serum Testoserone	**1**	1.56	1.02	3.03	1.24
	2	1.16	0.89	1.15	0.02
	3	0.68	2.28	1.25	0.63
	4	2.47	0.22	0.42	1.52
	5	1.76	4.44	0.03	1.24
	6	3.71	0.24	0.5	0.62
	MEAN	1.8898	1.514	1.0633	1.045
	S.D	1.0745	1.6179	1.0682	0.6091
	P0 Value	—	NS	NS	<0.05
	P1 Value	—	__	NS	__
	P2 Value	—	__	—	NS
	P3 Value	—	—	__	NS

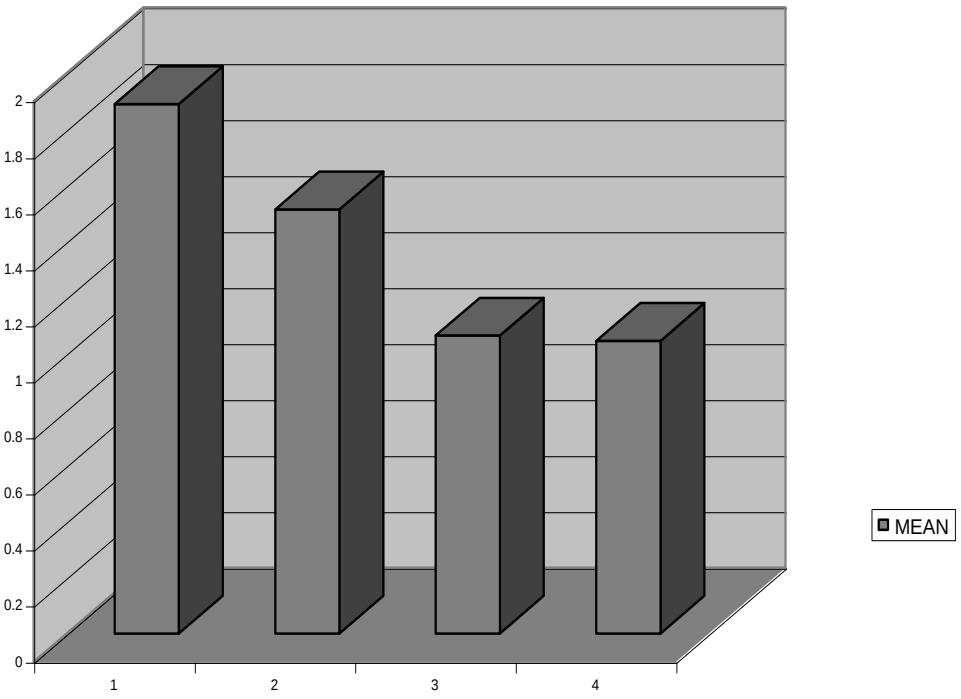
P0: Significant difference between the group and the control group

P1: Significant difference between A1 and A2

P2: Significant difference between A1 and A3

P3: Significant difference between A2 and A3

Chart 11 : serum testosterone in rats receiving propylthiouracil 0.1% for 2, 4, and8 weeks compared with the control group



Effect of hyperthyroidism on serum testosterone (ng/ml):

Table (12) shows the serum testosterone level in rats receiving thyroxine injection at a dose 100 µg/kg/d. for 2,4 and 8 weeks compared with the control. In which the mean value of serum testosterone in the control group is 1.8898 ± 1.0745 ng/ml. (B_1) mean value is 1.1987 ± 1.451 ng/ml, it shows no significant difference compared with control group. (B_2) mean value is 1.0467 ± 1.2471 ng/ml. It shows no significant difference compared with control group and no significant difference compared with (B1). (B_3) mean value is 1.0191 ± 0.843 ng/ml. It shows significant decrease of serum testosterone level compared with the control group $p < 0.05$, with no significant difference compared with (B1) and (B2). Chart : (12) shows that the significant decrease in the serum testosterone after thyroxine administration occurs after 8 weeks. From the above **we concluded that** hyperthyroidism causes no significant decrease in serum testosterone level when induced for 2 and 4 weeks, but it begins to cause significant decrease after 8 weeks.

On conclution the results of our study shows that both hypo- and hyperthyroidism have an effect on the testicular function of adult male rats. As following

Table (12): serum testoserone level in rats receiving thyroxine for 2, 4, and 8 weeks compared with the control group

Group		Control	B1	B2	B3
Serum Testoserone level	1	1.24	0.62	0.24	0.19
	2	0.02	0.14	0.38	1.35
	3	0.63	3.57	1.75	0.29
	4	1.52	0.19	3.3	0.94
	5	1.24	0.24	0.37	0.84
	6	1.62	2.43	0.24	2.5
	MEAN	1.8898	1.1987	1.0467	1.0191
	S.D	1.0745	1.451	1.2471	0.843
	P0 Value	—	NS	NS	<0.05
	P1 Value	—	__	NS	__
	P2 Value	—	__	—	NS
	P3 Value	—	—	__	NS

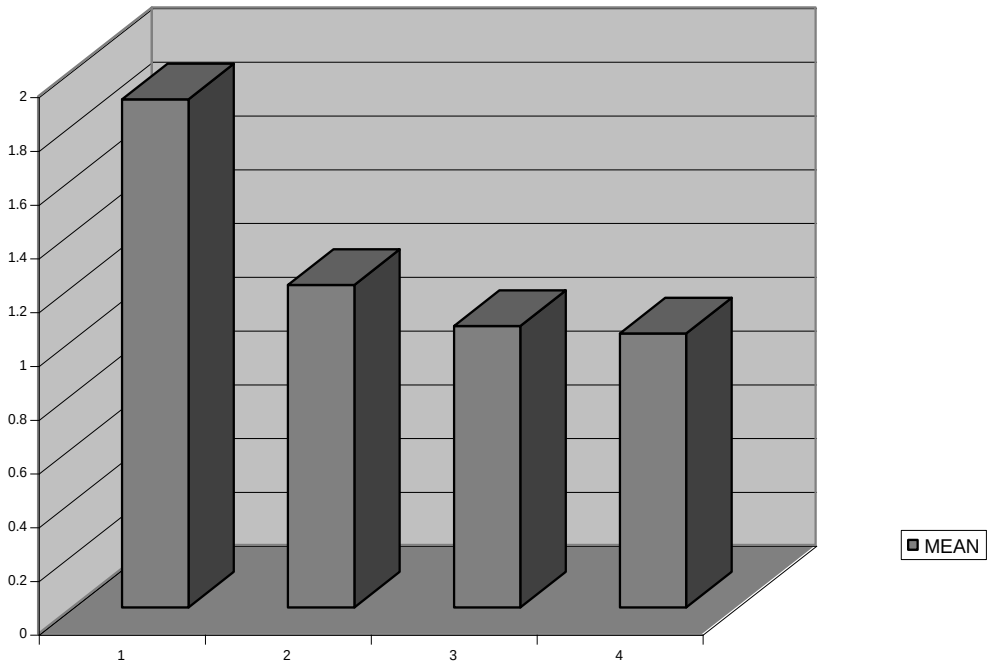
P0: Significant difference between the group and the control group

P1: Significant difference between B1 and B2

P2: Significant difference between B1 and B3

P3: Significant difference between B2 and B3

Chart 12 : serum testosterone in rats receiving thyroxine for 2, 4, and8 weeks compared with the control group



From **table (13)** ,We found that Induced hypothyroidism causes

1) no significant changes in the testicular weight after 2,4,8 weeks compared with the control group.

2)significant decrease in sperm count after 2,4,8 weeks compared with the control group and this effect increase with time.

3) significant decrease in sperm motility after 4,8 weeks compared with the control group and become more at 8 weeks.

4) significant increase in sperm abnormalities after 8 weeks in the adult male rats compared with the control group.

5)significant decrease in serum testosterone level after 8 weeks compared with the control group.

Table (13): Effect of hypothyroidism on testicular function Including Testicular Weight, Sperm Count,Sperm Motility,Sperm Abnormality and Serum testosterone level in adult male rats after 2, 4 and 8 weeks compared with the control

Group		CONTROL	A1	A2	A3
serum T4	Mean	75	51.546	43.083	37.666
	SD	7.238	3.281	4.352	13.952
	P value	—	<0.01	<0.001	<0.01
Testicular Weight	Mean	2.0477	1.8162	2.435	2.1568
	SD	0.6019	0.1648	0.5737	0.3349
	P value	——	Ns	Ns	Ns
Sperm Count	Mean	94.6667	86.5	82.3333	64.3333
	SD	13.5892	5.4681	16.5731	8.641
	P value	——	NS	<0.05	<0.05
Sperm Motility	Mean	59.1667	48.1667	46.1667	34.5
	SD	5.8452	9.3684	9.261	7.7136
	P value	—	NS	<0.05	<0.05
Sperm abnormality	Mean	14.6667	13.8333	15.5	24.1667
	SD	4.9666	3.6009	2.3452	2.4833
	P value	—	NS	NS	<0.05
Serum testosterone	Mean	1.8898	1.514	1.0633	1.045
	SD	1.0745	1.6179	1.0682	0.6091
	P value	—	NS	NS	<0.05

In **table (14)** we found that Induced hyperthyroidism causes

1) no significant changes in the testicular weight after 2,4,8 weeks compared with the control group.

2)significant decrease in sperm count after 2,4,8 weeks compared with the control group and this effect was maximum at 4weeks of administration.

3) significant decrease in sperm motility after 2,4,8 weeks compared with the control group and not affected by the time.

4) significant increase in sperm abnormalities after 8 weeks in the adult male rats compared with the control group.

5)significant decrease in serum testosterone level after 8 weeks compared with the control group.

SD: standerd deviation
P :significant

Table (14): Effect of hypothyroidism on testicular function Including Testicular Weight, Sperm Count,Sperm Motility,Sperm Abnormality and Serum testosterone level in adult male rats after 2, 4 and 8 weeks compared with the control

Group		CONTROL	B1	B2	B3
serum T4	Mean	75	113.833	109.666	149.833
	SD	7.238	13.496	25.943	31.663
	P value	__	<0.01	<0.05	<0.01
Testicular Weight	Mean	2.0477	1.7757	1.5318	2.1127
	SD	0.6019	0.2024	0.3967	0.2429
	P value	___	Ns	Ns	Ns
Sperm Count	Mean	94.6667	78.5	68.8333	61
	SD	13.5892	18.4905	17.2907	7.4833
	P value	__	NS	<0.05	<0.05
Sperm Motility	Mean	59.1667	48	43.3333	48.5
	SD	5.4852	6.1644	5.0465	4.8477
	P value	—	<0.05	<0.05	<0.05
Sperm Abnormality	Mean	14.6667	18.3333	15	20.3333
	SD	4.9666	3.4448	3.2249	5.2409
	P value	—	NS	NS	<0.05
Serum testosterone	Mean	1.8898	1.1987	1.0467	1.0191
	SD	1.0745	1.451	1.2471	0.843
	P value	—	NS	NS	<0.05