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Tital of Thesis

Ameliorative Effect of Selenium on Hemostatic Mechanism and some Physiological Parameters in Thyroid Disturbant Male Rats

Abstract of Thesis

Summary

This study was carried out in the animal house of the College of Veterinary Medicine –University of Basrah during the period extending from 15/1/2016 to 1/1/2017. An attempt has been done to induce thyroid disturbance by using different agents such as propylthiouracil (PTU) as antithyroid drug and L-thyroxin(L-T_4) and investigation of the effects of these agents on body weight gain , as well as on some physiological and histopathological changes in male rats. Moreover, the present study aimed to evaluate the ameliorative effect of orally selenium supplementation in experimentally induced thyroid disturbance male rats.

For this purpose two experiments have been included in the present study:

First experiment: One-hundred twenty male rats weighed (180-250g) and aged (4- 5 month) were divided into 6 equal groups (20 rats / group).

First group (control) was drenched 3ml of physiological saline; second group (PTU) was drenched propylthiouracil (50mg/kg B.W.), third group(L-T_4) was drenched L-thyroxine drug (50µg/kg B.W.),fourth group was treated with sodium selenite (10µg/kg B.W.). fifth group (PTU+Se) was drenched propylthiouracil (50mg/kg B.W.)+sodium selenite(10µg /kg B.W.) and sixth group(LT_4+Se) was drenched L-thyroxine drug (50µg/kg B.W.)+ sodium selenite(10µg /kg B.W.).

Treatments were extended for 2 months.

The results of present study revealed the following:

A significant decrease in body weight gain of male rats treated with PTU and L-T_4 compared with control group, Se group and another groups. A significant decrease in RBC, Hb, PCV, WBC, MPV and P-LCR of male rats treated with PTU and L-T_4. A significant increase in PLT and PCT of male rats treated with PTU and L-T_4. A significant decrease in prothrombine time, activated Partial thromboplastin time and fibrinogen of male rats treated with PTU compared with control group and Se,Se+PTU,Se+L-T_4 groups. A significant increase prothrombine time, activated Partial thromboplastin time and fibrinogen of male rats treated with L-T_4 compared with control group and Se, Se+PTU, Se+L-T_4 groups. In contrast, Lipid profile showed a significant ($P<0.05$) decrease of total cholesterol, low density lipoprotein and very low density lipoprotein while a significant increase of high density lipoprotein concentration in Se group. Whereas PTU group registered a significant increase in T.Chol, TG, LDL and VLDL

concentrations and a significant ($P<0.05$) decrease of HDL concentration compared with control group. Also L-T_4 group registered a significant increase in LDL and VLDL concentrations and a significant ($P<0.05$) decrease of HDL concentration compared with control.

Serum alanine aminotransferase concentrations were significantly ($P<0.05$) increased in PTU and L-T4 groups as compared with control group and Se group, whereas aspartate aminotransferase concentration was significantly ($P<0.05$) increased in all treated groups compared with control.

The obtained results revealed that hypothyroidism has been induced by PTU treatment is accompanied by significant ($P<0.05$) decrease in serum T_3, T_4 concentrations compared with control. On the other hand, TSH concentration showed a significant ($P<0.05$) increase in PTU group and significant decrease ($P<0.05$) in L-T_4 group a compared with control.

A significant decrease in serum concentrations of FSH and LH have been shown in serum in PTUand L-T_4 groups. Also a significant decrease($P<0.05$) of epididiymal sperm concentration, sperm motility and viability and a significant($P<0.05$) increase of sperm abnormalities were recorded in PTU and L-T_4 groups compared with control and another treated groups. While a significant increase($P<0.05$) of epididiymal sperm concentration, sperm motility and viability and significant($P<0.05$) decrease of sperm abnormalities were recorded in Se alone, PTU+Se and L-T_4+Se. At the end of experiment half number of each group was sacrificed for studying the weight of thyroid gland, gonad and other organs such as (liver, kidney and testes).

The histological study revealed many pathological changes of different degrees in thyroid gland (PTU group showed hyperatrophy of thyroicyte, vacuolation in colloid and depletion of parafollicular cells, L-T4 group showed microfollicles hyperplasia of thyroicyte, vacuolation in colloid, depletion of parafollicular cells). The liver, kidney and testes showed slight histological changes noticed in rats treated with Se+PTU and Se+L-T_4 compared with PTU and L-T_4 groups alone (showed damage of hepatic tissue and renal tissue in PTU and L-T_4 groups).

The histological changes of thyroid gland and other organs of male rats showed a positive amelioration in Se group alone, PTU+Se group and L-T_4+Se group.

Second experiment aimed to elucidate the effect of treatment with sodium selenite alone on the fertility efficiency and also in combination with PTU and L-T_4 in thyroid disturbant adult male for 30 days. The remainder male rats from 1st experiment (Sixty rats) (10 rats from each group) were mated with adult health non treated females (1♂:1♂♀). Reproductive efficiency was affected in all studied groups but the treatments with PTU and L-T4 showed more harmful on the fertility efficiency in male rats. The fertility rates in female rats of Se, PTU and L-T4 were 100 %,20% and 20 %, respectively compared with 80% of control. Reduction in the number of newborn as well as the occurrences of mortality rate and malformation rate have been registered in PTU and L-T4 group during pregnancy. The results revealed improvement in number of newborn rate in male rats treated with Se +PTU and Se +L-T_4. Whereas fertility rate reached (100%) in selenium treated rats, 80% in PTU +Se treated rats and 70% in Se+L-T_4 treated rats. No mortality and malformation was recorded in Se, Se +PTU and Se+ L-T_4 groups.