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ANALYSIS OF TESTIS BIOCHEMISTRY OF RATTUS NORVEGICUS AFTER TREATMENT OF DIURETIC DRUG COMPOUND

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ABSTRACT

The diuretic drug compound thiazide are used in the present study deal with side effects on the total protein, cholesterol, alkaline phosphatase and acid phosphatase in the testis of Rattus norvegicus. The decrease value of alkaline phosphatase and elevated value of total protein, cholesterol and acid phosphatase on the testis.

Keywords: Thiazide, Testis, Alkaline and Acid Phosphatase; Total Protein and Cholesterol.

INTRODUCTION

Diuretic are drugs that increase secretion of excess water and salt that accumulates in tissue and urine. That is used to maintain volume and composition of body fluids in the variety of clinical situation. The widely used of drugs are transported blood through the tubular cells into tubular fluid and that compound generally safe, other them therapeutic agents and they cause side effects (Arthur, 2000). Drug compound thiazide type of diuretic is carbonic inhibitor. The carbonic anhydrase is important for intraocular fluid formation and inhibitors of the enzymes are effective in decreasing intraocular pressure and therefore use to treat glaucoma. The biochemistry changes of thiazide are to increase cholesterol, total protein and acid phosphatase and decrease of alkaline phosphatase enzymatic activity. In the present investigation was to determine the effects of drug compound in the testis of male Rattus norvegicus.

MATERIALS AND METHODS

Drug compound thiazide dissolved in distilled water and administered orally using catheter tube at 100 mg/kg body weight.

Animals

Forty-two male rats, each weighing approximately (180±10 gm) were used. Animals were maintained on a commercial balanced rat diet and was allowed free access of food and water. The experimental male rats kept in clean cages to acclimatize in the laboratory conditions.

Experimental Design

Forty-two male rats divided into six groups of 7 animals in each were treated as follows. Group 1, 3 and 5 as treated with thiazide and group 2, 4 and 6 given vehicle and left as control. Animals were fasted overnight separately on 10th, 20th and 30th days. On the next days each experimental protocol after recording the body weight, the animals were sacrificed by decapitation and the testis were dissected out, blotted of blood, rinsed in phosphate buffer saline (pH-7.4) and immediately proceed for biochemical estimation.

Biochemical Estimation

The estimation of total protein was determined by Lowry et al. (1951); while cholesterol by King and King (1954) alkaline and acid phosphatase determined by King (1954).

Statistical Analysis

All the data were expressed as mean, S.E.m. and statistical significance between the control and experimental rats by Fisher and Yates (1963).

RESULT AND DISCUSSION

In the present study the total protein, cholesterol content and acid phosphatase value increase very significantly ($p < 0.001$) with increase Thiazide administration time period as compared with control group of rat (Table-1). Alkaline phosphatase decrease significantly ($p < 0.05$) after 10 days, while highly significant 20 days ($p < 0.01$) and very highest significant of 30 days of the thiazide treatment compared with control group of rats. (Table-2)

Table-1: Effect of Thiazide on the Total Protein and Cholesterol content in the testis of rats

S. No.	Parameters	Treatment time (in days)	No. of Rats	Control groups		Treated groups	
				Mean	±S.Em.	Mean	±S.Em.
1.	Total Protein (mg/ml.)	10	7	435.22	±4.90	666.66	40.06***
		20	7	455.44	±14.04	888.88	29.10***
		30	7	498.77	±19.22	977.77	57.44***
2.	Total Cholesterol mg/ml.	10	7	0.012	0.003	0.029	0.002***
		20	7	0.017	0.002	0.047	0.003***
		30	7	0.020	0.003	0.080	0.002***

±S.Em.- Standard of Mean, ***- Very highly significant (P<0.001)

Table-2 :Effect of Thiazide on the Alkaline and Acid Phosphatase in the testis of rats

S. No.	Parameters	Treatment time (in days)	No. of Rats	Control groups		Treated groups	
				Mean	±S.Em.	Mean	±S.Em.
1.	Alkaline phosphatase	10	7	35.23	±0.96	33.11	±1.02*
		20	7	37.12	±1.02	29.89	±0.91**
		30	7	39.81	±1.05	22.04	±1.78***
2.	Acid Phosphatase	10	7	35.98	±1.18	60.08	±1.26***
		20	7	38.12	±0.99	65.17	±1.21***
		30	7	41.67	±0.81	76.69	±1.02***

±S.Em.- Standard of Mean, *significant (P<0.05), **-Highly significant (P<0.01), ***- Very highly significant (P<0.001)

Colorimetric techniques were employed in this studies to measure biochemical parameter of the testis of rats during control conditions and after orally administration of 100 mg/kg. body weight thiazide. The Thiazide is widely used diuretic drug component having to many clinical uses. However, is limited by several endocrine and biochemical effects. In the present investigation total protein in the testis increase due to the several adverse side effects of drug compound, present finding supported by Ames (1986) due to metabolic condition which is produced by thiazide compound mainly characterized by increase protein contents in the rats and other mammals. Similar observations have been made by Traft and Sweeny (1995) in the albino rat after routine dose of thiazide, an increase total cholesterol in rat testis may be due to adverse side effects of drug compound thiazide. The increase in lipids play a very important role in the development and progression in renal distress and induced specific changes in the metabolism of cholesterol like that Arthur (2000) in liver of rat due to the catecholamine release which is stimulated hepatic cholesterol synthesis and caused hypokalemia. Similar results have been supported by Moniyan and Ennis (1990) and Miner *et al.* (1983) in human and rats due to the adverse side effects of diuretic drug compound in the testis of Albino rat.

The present study, alkaline phosphatase decrease in the testis of rat due to the several adverse side

effects of drug compound Menard *et al.* (1975) showed the decrease in microsomal enzyme activity in the testis of rats after spironolactone treatment. While, Setchell and Wallare (1972) also noted a decrease in the alkaline phosphatase activity and lysosomal enzymes in the liver of albino rat after the treatment of antidiuretic drug compound of spironolactone and Layne *et al.* (1993) have revealed the decrease in the testicular enzyme activity in guinea pigs after the treatment of spironolactone antidiuretic compound.

In the acid phosphatase has the greatest share in the semen and an increase in the percentage of acid phosphatase may cause prostatic carcinoma. In the present investigation the acid phosphatase in the testis of *Rattus norvegicus* increase due to the side effects of thiazide drug compound. Alan *et al.* (1980) have reported the increase in the acid phosphatase in the testis and distal cauda epididymis in albino rat due to several diuretic elements Ochs *et al.* (1978) and Fujita *et al.* (1982) also have shown changes in certain enzymes in the liver of albino rats after treatment of spironolactone diuretic drug compound.

Additional studies are now needed to establish the identity of the metabolites *in vivo* and to determine the sites of production of various known metabolites of thiazide diuretic drug compound. Such studies should contribute particularly with respect to the role of metabolites in the therapeutic action and side effects of diuretic drug compound.

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