DOI : 10.33451/florafauna.v25i1pp78-80

FLORA AND FAUNA ISSN 2456 - 9364 (Online)

2019 Vol. 25 No. 1 PP 78-80 ISSN 0971 - 6920 (Print)

# Modulation of Triglycerides in female *Rattus rattus* with Steroid Contraceptive Algestone acetophenide (DHPA)

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***Received*** **:** 28.03.2019; ***Accepted*** : 18.04.2019

## ABSTRACT

Young female Black rat (*Rattus rattus*), were administered monthly long acting steroid contraceptive to induce hypertriglyceridemia. It was observed that by 3 weeks of the second injection of estrogen containing mixed type of contraceptive, female rats developed consistent and frank hyperglyceridemia . TG in the treated rats was 195.8 ± 7.44 mg /100 ml as compared to 91.5 ± 6.27 mg/100ml in plasma of the control group.

Figure : 01 References : 07 Table : 01

KEY WORDS : Contraceptive, *Rattus rattus,* Triglycerides

## Introduction

Algestone acetophenide, more commonly known as dihydroxyprogesterone acetophenide (DHPA) is a progestin medication which is used in combination with an estrogen as a form of long-lasting injectable birth control. DHPA is not active by oral administration, so injected intramuscularly once a month. It has side effects like headaches, acne, hair loss, decreased sex drive[5], mood swings[6] and changes in body weight. Hypertriglyceridemia is a major effect of ingesting estrogen containing steroid contraceptive. The present report deals with our attempts to induce frank hypertriglyceridemia in female rats by treatment with long acting steroid contraceptives.

## Materials and Methods

In the present investigation, healthy mature female Black rat (*Rattus rattus*), (110 ± 20g wt) were used. They were maintained in well ventilated and sterilized animal cage (35 cm L x 25 cm W x 18 cm H) with a constant 12 hours light and dark schedules in laboratory. They were fed regularly *ad libitum* with the food (a mixture of cereals, vegetables and cheese) 5 g three times per day. (They eat about 15 grams (0.53 oz) per day and drink about 15 milliliters (0.53 imp fl oz; 0.51 US fl oz) per day[1]. Their diet was high in water content[4]. They were grouped into three groups *viz* control, mixed and DP and acclimatized at room temperature (26 ± 20C). Animals, categorized into three groups: rats in mixed group were administered 0.1ml/animal /month, a long acting steroid contraceptive preparation containing in each ml 100mg dihydroxyprogesterone acetophenide and 5mg estradiol enanthate; animals in DP group were injected 0.1ml/ animals/month, a preparation containing 150mg/ml medroxyprogestrone acetate[3]. Animals in the control group were treated with the same amount of physiological saline. Three weeks after the second injection, animals were fasted overnight. Sampling from the lateral saphenous vein is a relatively quick method of obtaining blood samples 1.0 ml from each rat. Blood flow was stopped by gentle finger pressure over the punctured site. Animals were returned to their cage after the blood flow had stopped. The blood was collected from lateral saphenous vein with the help of microsyringe into the sterilized vial containing anticoagulant EDTA (Ethylene diamine tetra acetic acid) at concentration of 1 mg/ 5 ml of blood. The extracts were used for estimation of triglycerides, cholesterol and phospholipids.

## Results and Discussion

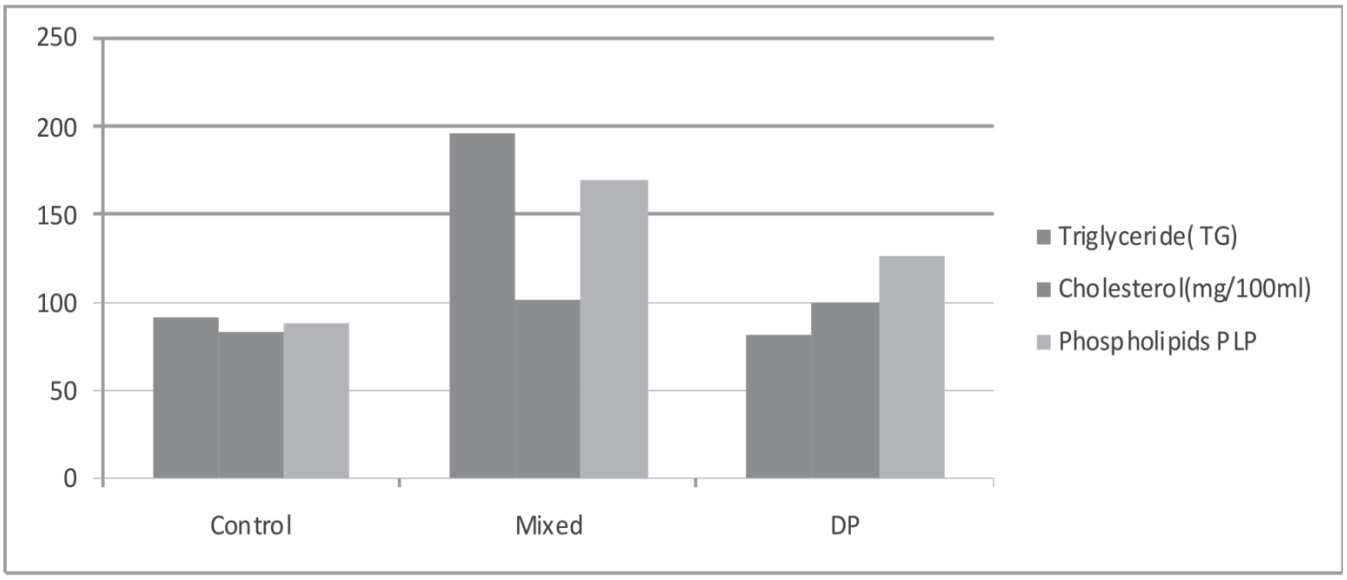
As shown in Table-1 , treatment of female rats with mixed type of steroid contraceptive resulted in significant increase in the concentration of plasma triglycerides, plasma cholesterol and phospholipids. Levels of plasma lipids of rats treated with medroxyprogesterone showed no effect on TG but both cholesterol and phospholipids increased significantly.

The dose of steroid contraceptive used in this report

**TABLE-1 : Lipid Profile of female rat (*Rattus rattus*) treated with steroid contraceptives**

| Group | Plasma | | |
|---|---|---|---|
| | Triglyceride (TG) | Cholesterol (mg/100ml) | Phospholipids ( PLP) |
| **Control** | 91.5± 6.27 | 83.0 ± 3.93 | 88.0 ± 5.4 |
| **Mixed** | 195.8 ± 7.44 | 101.0 ± 5.86 | 169.0 ± 9.60 |
| | P<0.001 | P<0.05 | P<0.001 |
| **DP** | 82.1 ± 6.09 | 100.5 ± 2.17 | 126.0 ± 6.23 |
| | NS | P<0.001 | P < 0.01 |
| *Animals in control group were treated with normal saline; in the mixed group with estrogen containing mixed contraceptive and in DP group with medroxy- progesterone acetate | | | |

**Fig. 1 : Modulation of Triglycerides, Cholesterol and Phospholipids in female *Rattus rattus* with Steroid Contraceptive dihydroxyprogesterone acetophenide (DHPA)**




Data presented in this report demonstrate that mixed contraceptive induce a frank hypertriglyceridemia in female rats. ( *Wang,Q et al.* 2016)

was not excessive since five times the human dose (on weight to weight basis) has been reported to be required to inhibit ovulation in rodents. Induction of hypertriglyceridema 3 weeks after the second injection of the steroid contraceptive seems to be consistent with the earlier reports[2] that it takes 4-6 weeks for lipids to reach a steady state after treatment with steroid contraceptives.

Data presented in this report demonstrate that mixed contraceptive induce a frank hypertriglyceridemia in female rats[7].

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