Effect of Maternal Drug Treatment during Pregnancy and Lactation Oxymetholone through the Levels of Sex Hormones in Adult Female Offspring Rats

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ABSTRACT

Background: Oxymetholone; synthetic androgen dependent on a less androgenic activity of testosterone. The aim of this study was to investigate the effects Oxymetholone on hormones estrogen and progesterone in the adult female offspring whose mothers during pregnancy and lactation have been affected by this drug.

Materials and Methods: This study was a laboratory study of 56 female rats and 14 male Wistar rats were used. N = 8 animals into 7 groups: control, control 1 (gestational day 21), control 2 (lactation day 21), control 3 (of pregnancy - lactation 42 days) and were divided into experimental groups. DMSO as vehicle sham group. The experimental groups with Oxymetholone; 10mg/kg concentration (intraperitoneally injection). Hormone concentrations were measured by RIA method. Results: Estrogen levels in any of the groups did not show significant differences with the control group. A significant decrease in birth weight rat in the experimental groups 1 and 3 show. Weight of two months, significant reduction in experimental groups 1 and 3 show. Progesterone in all experimental groups shows a significant decrease. Conclusion: Oxymetholone was not effected on estrogen level, but affected on progesterone level that decreased, but this was probably due to the occupation of progesterone and progesterone receptors induced negative feedback. Weight loss is probably due to increased protein catabolism.

Key words: Pregnancy, Oxymetholone, Estrogen, Progesterone, Rats.

Introduction

Until 1935, a report on the effects of anabolic steroids on growth and muscle strength was not presented, since anabolic steroids are used as ergogenic drugs. Taking medications as ergogenic drugs in the 1954 Olympic weightlifters began to spread over most sports. Enhancing anabolic drugs reduce death and cell damage. Scientists because of the short half-life and rapid degradation of testosterone in the body into thinking it fell analog drugs that the lower the metabolism and degradation liver and the body is more synthetic activity. Research by scientists, more than testosterone analogues were synthesized that have effects similar to testosterone, one of them is Oxymetholone; drug. Most of these effects include increased nitrogen retention and protein synthesis, production of red blood cells and increased deposition of calcium is in the bones. Oxymetholone; taking too high doses cause abnormalities such as lung cancer, ovarian cycle irregularities, benign tumor of the adrenal secretory activity of liver damage and jaundice, and eventually liver cancer.

The effects of neonatal sex hormone Oxymetholone; studies conducted on ovarian tissue and that it is used in a study of the physiological effects Oxymetholone; higher doses increase the number of primordial follicles, reducing the number of primary follicles, growing, graph, and reduces the weight and diameter of the ovarian corpus luteum and granulosa layers were reduced in diameter. In 1973, Warren and his colleagues looked at the effects of Oxymetholone; over the menstrual cycle and its regulation and found that the use of Oxymetholone; nearly four days and the amount of 30 mg every 6 hours could shorten the luteal cycle, and this is due to the influence of the axis hypothalamus - pituitary - gonad axis. Katertun announced in 1981 that Oxymetholone; influence the secretion of
progesterone and other steroids can be effective in regulating fertility. According to the Oxymetholone effects at doses far higher than physiological treatment of mothers during pregnancy and lactation on the levels of the hormones estrogen and progesterone are not babies, we came in trying to do this study. Thus, the aim of this study was to investigate the effects of gonadal hormone Oxymetholone; adult female infant that the mother during pregnancy or lactation or both of these drugs have to be consecutive.

Methods:

This study was an in vitro study. In order to study all the moral principles on how to work with laboratory animals has been considered. For this study, 56 adult female rats and 14 male Wistar rats, 110-120 days old and weighed approximately 200 ± 20g and kept in animal breeding center of Shiraz, Shiraz University of Medical Sciences were used. The animals are tested for compatibility with the environment at home two weeks before the animals were kept in Jahrom Branch. Meal for animal feed and poultry animal pressed the company was prepared Shiraz. 22 ± 2 ° C ambient temperature and relative humidity 50-55%, respectively. Photoperiod of 12 hours light and 12 hours darkness also considered. Room air by the air conditioning had been embedded in the animal house. Animals were kept in special cages every 2 days once they were clean and disinfected. The mice were divided into 7 groups of 8 Control, 1,2,3 sham and Experimental 1,2,3. Four female mice were caged with a male rat. The control group received standard laboratory food and water. Groups 1,2,3, DMSO as solvent Oxymetholone; respectively in pregnancy (21 days), lactation (21 days) \( V_{ bardary - lactation }^{ (42 \text{ days}) } \) received an intra-peritoneal injection. 1,2,3 Experimental groups respectively Oxymetholone; medicine with a concentration of 10 mg per kg of body weight during pregnancy (21 days), lactation (21 days) and pregnancy - lactation (42 days) were injected intraperitoneally receive. Babies born on the first day to help digital scale with a precision of 0/001 (MODEL AND) Weighing were made in Japan. In all groups after two months of birth, and after weighing them, to help 5c squirt blood from the heart baby was two months old. Blood samples were collected at 3000 rpm for 15 min and centrifuged, and serum was separated. Serum samples for subsequent review in the freezer - 20 ° C were maintained. The next stage of hormones estrogen and progesterone levels in medical diagnostic laboratories using radioimmunoassay kits pre-arranged driver of Medicine (REF: A21854, and REF: IM1188) was determined. Results using SPSS version 18 software and ANOVA tests (ANOVA) and Duncan test were analyzed. Data were calculated as mean and standard deviation of \( P \leq 0.5 \) was considered as statistically significant. According to Duncan, 10 in each group if there is a common letter are not significantly different. The diagrams were drawn by Excel software.

Results:

Result of a significant decrease in birth weight mice (\( P \leq 0.5 \)) in the experimental group 1 (pregnancy) and experiment 3 (of pregnancy - lactation) were observed (Figure 1). Also, the results are significantly lower than the weight of two months, the mice (\( P \leq 0.5 \)) in group 1 (pregnancy) and experiment 3 (of pregnancy - lactation) than the control group shows (Figure 2). The results showed that serum levels of estrogen in no significant difference between groups (\( P \leq 0.5 \)) does not show the control group (Figure 3). Progesterone concentration significantly reduced in all experimental groups (\( P \leq 0.5 \)) compared to the control group shows (Figure 4).

![Fig. 1: A day Weight of rats.](image-url)
Fig. 2: Two months Weight of rats.

Fig. 3: serum estrogen.

Fig. 4: serum progesterone.
Therefore, the above interpretation is not receiving were not for a while under the influence of drugs. Drug Oxymetholone;, and end of injection, the mice weight loss in newborns because it is likely that the protein catabolism to accelerate. It can be noted that after stopping the drug, the cortisol receptor and cortisol, when cortisol levels are high receptor but the effect is reversed. To cope with the low dose of although this is beneficial, but stop taking the drug, improving muscle is damaged, it will accelerate, receptors, which prevents muscle deterioration and can not be produced and secreted hormones that the ovaries. Impaired and therefore do not ovulate regularly, which include different phases of ovarian estrogen and progesterone on ovulation, ovarian tissue integrity is maintained. This process, especially in immature rats teratogenic effects in these areas will create more. Therefore, the above results of the effects of hormone therapy on neonatal rats Oxymetholone; treatment of mothers during pregnancy and lactation should be interpreted. Birth weight (in one day) newborns significantly reduced in all groups compared to the control group but decreased significantly in experimental groups 1 and 3 are observed. Also weighing two months than in all groups except the control group decreased that only significantly in experimental groups 1 and 3. This is probably due to anabolic steroid binding to cortisol receptors, which prevents muscle deterioration and improving muscle is damaged, it will accelerate, although this is beneficial, but stop taking the drug, the effect is reversed. To cope with the low dose of cortisol, when cortisol levels are high receptor but after stopping the drug, the cortisol receptor and protein catabolism to accelerate. It can be noted that weight loss in newborns because it is likely that the drug Oxymetholone;, and end of injection, the mice were not for a while under the influence of drugs. Therefore, the above interpretation is not receiving Oxymetholone; After a period of use, the catabolism of proteins, so the weight loss in the groups receiving Oxymetholone; during pregnancy is justified. Furthermore, weight loss in the group treated during pregnancy - lactation can be due to the transport of drugs through breast milk. Also according to the groups receiving DMSO no significant difference between the groups receiving Oxymetholone; same period, therefore the results can not be said that DMSO has a destructive effect on rat weight and other body tissues. In 1999, the band announced that an extensive study of the NTP feeding Oxymetholone; 350 and 160 mg/kg doses for 16 days caused weight gain in female rats and Oxymetholone; well fed 30 mg/kg of 2 years has caused weight gain in female rats. In another study in 2003 showed that men and women with AIDS and 100 daily 150mg/kg medicine is a compensated weight lost due to HIV. So, we can say that in terms of weight loss may be related to low-dose groups, non-direct transmission from parent to child therapy, and the choice of solvent is Oxymetholone; company. The decrease (not significant) in estrogen levels in all groups. Progesterone concentrations in all experimental groups shows a significant decrease. In female gonadotropin releasing hormone (GnRH) in hypothalamic nuclei are and the basal medium is produced through the blood system portal to the anterior pituitary and the cells luteotrop and policotrop affects the secretion of LH and FSH. LH and FSH through the systemic circulation to the gonads and connected to your receiver and stimulate the growth of follicles and product of secondary follicles. LH hormone and follicle-graph can also cause efflorescence. If you are not pregnant after ovulation due to high levels of the hormones estrogen, progesterone, LH and FSH will be seen in a negative feedback response that inhibit is a hormone produced by the hormone GnRH from the hypothalamus and stop the pituitary hormones LH and FSH, and ultimately reduce the amount of estrogen and progesterone are hormones. In a study conducted in 2001 by Shahidi, they found that all the body's tissues with androgen receptors that the androgen receptor in reproductive and non-reproductive organs is one of the synthetic androgen receptors are accepting all of androgens, it is an anabolic steroid Oxymetholone;, which occupies

Table 1: Comparison of control groups, experimental and control parameters, birth weight in two months, the hormones estrogen and progesterone.

<table>
<thead>
<tr>
<th>Group</th>
<th>Parameter</th>
<th>A day Weight (g)</th>
<th>Two months Weight (g)</th>
<th>Estrogen (pg / ml)</th>
<th>Progesterone (ng / ml)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control</td>
<td>c6/37±0/155</td>
<td>b14/1±7±4/84</td>
<td>a113/8±8±3/173</td>
<td>b4/6±58±0/328</td>
<td></td>
</tr>
<tr>
<td>Ox pregnancy</td>
<td>a8/35±0/150</td>
<td>a105±3±7±73</td>
<td>a93±8±6±0/64</td>
<td>a2/530±0/462</td>
<td></td>
</tr>
<tr>
<td>Ox breastfeeding</td>
<td>b5/85±0/189</td>
<td>a130±8±5/47</td>
<td>a109±36±10/703</td>
<td>a2/460±0/354</td>
<td></td>
</tr>
<tr>
<td>Oxy pregnancy - lactation</td>
<td>a5/06±0/198</td>
<td>a102±6±6/01</td>
<td>a91/56±5±318</td>
<td>a1/96±0±185</td>
<td></td>
</tr>
<tr>
<td>DMSO pregnancy</td>
<td>c6/19±0/148</td>
<td>b136±0±2/79</td>
<td>a84±62±9±703</td>
<td>b4/274±0±522</td>
<td></td>
</tr>
<tr>
<td>DMSO breastfeeding</td>
<td>b5/92±0/130</td>
<td>a110±4±5/151</td>
<td>a48±1±0±6±318</td>
<td>b4/106±0±139</td>
<td></td>
</tr>
<tr>
<td>DMSO pregnancy - lactation</td>
<td>b5/90±0/357</td>
<td>b128±9±6±63</td>
<td>a108±10±15±481</td>
<td>b3/912±0±282</td>
<td></td>
</tr>
</tbody>
</table>

Means in each row having at least one common letter are significantly different at 5% level by Duncan test no.

Discussion:

Anabolic steroids - synthetic androgenic Oxymetholone; including the fact play a role that Androgenic hormones in the body that are doing drugs, but only one of many functions of the body's natural androgen doing well exert and its anabolic effect is nitrogen retention and protein synthesis and muscle growth affect the cell's DNA. All body tissues have androgen receptors. Reproductive and non-reproductive organs of the androgen receptor and androgen one such is the synthetic androgen. Medications at doses higher than the physiological inducer is useful for muscle size and strength. However, higher doses of the drug in addition to physiological androgen receptors, other receptors such as estrogen receptors, progesterone, mineralocorticoid and glucocorticoid negative feedback response to the occupation and lead to brain. Hypothalamic - pituitary – gonad axis disabled and can not be produced and secreted hormones that stimulate the ovaries. Impaired and therefore do not ovulate regularly, which is different phases of ovarian estrogen and progesterone on ovulation, ovarian tissue integrity is maintained. This process, especially in immature rats teratogenic effects in these areas will create more. Therefore, the above results of the effects of hormone therapy on neonatal rats Oxymetholone; treatment of mothers during pregnancy and lactation should be interpreted. Birth weight (in one day) newborns significantly reduced in all groups compared to the control group but decreased significantly in experimental groups 1 and 3 are observed. Also weighing two months than in all groups except the control group decreased that only significantly in experimental groups 1 and 3. This is probably due to anabolic steroid binding to cortisol receptors, which prevents muscle deterioration and improving muscle is damaged, it will accelerate, although this is beneficial, but stop taking the drug, the effect is reversed. To cope with the low dose of cortisol, when cortisol levels are high receptor but after stopping the drug, the cortisol receptor and protein catabolism to accelerate. It can be noted that weight loss in newborns because it is likely that the drug Oxymetholone;, and end of injection, the mice were not for a while under the influence of drugs. Therefore, the above interpretation is not receiving Oxymetholone; After a period of use, the catabolism of proteins, so the weight loss in the groups receiving Oxymetholone; during pregnancy is justified. Furthermore, weight loss in the group treated during pregnancy - lactation can be due to the transport of drugs through breast milk. Also according to the groups receiving DMSO no significant difference between the groups receiving Oxymetholone; same period, therefore the results can not be said that DMSO has a destructive effect on rat weight and other body tissues. In 1999, the band announced that an extensive study of the NTP feeding Oxymetholone; 350 and 160 mg/kg doses for 16 days caused weight gain in female rats and Oxymetholone; well fed 30 mg/kg of 2 years has caused weight gain in female rats. In another study in 2003 showed that men and women with AIDS and 100 daily 150mg/kg medicine is a compensated weight lost due to HIV. So, we can say that in terms of weight loss may be related to low-dose groups, non-direct transmission from parent to child therapy, and the choice of solvent is Oxymetholone; company. The decrease (not significant) in estrogen levels in all groups. Progesterone concentrations in all experimental groups shows a significant decrease. In female gonadotropin releasing hormone (GnRH) in hypothalamic nuclei are and the basal medium is produced through the blood system portal to the anterior pituitary and the cells luteotrop and policotrop affects the secretion of LH and FSH. LH and FSH through the systemic circulation to the gonads and connected to your receiver and stimulate the growth of follicles and product of secondary follicles. LH hormone and follicle-graph can also cause efflorescence. If you are not pregnant after ovulation due to high levels of the hormones estrogen, progesterone, LH and FSH will be seen in a negative feedback response that inhibit is a hormone produced by the hormone GnRH from the hypothalamus and stop the pituitary hormones LH and FSH, and ultimately reduce the amount of estrogen and progesterone are hormones. In a study conducted in 2001 by Shahidi, they found that all the body's tissues with androgen receptors that the androgen receptor in reproductive and non-reproductive organs is one of the synthetic androgen receptors are accepting all of androgens, it is an anabolic steroid Oxymetholone;, which occupies
androgen receptors and negative feedback responses can be triggered and non-triggered activation of the axis hypothalamus - pituitary - gonadal be. Therefore, other stimulating hormones are not stimulate and production as much as it was reduced. Studies by Azarnia et al show that in 1385 Oxymetholone are decreased progesterone levels in mice. These results are consistent with findings because of the amount of progesterone in the experimental group and in all prescribed courses Oxymetholone; significantly lower than the control group shows. Progesterone levels also nonsignificantly reduced in the group receiving DMSO may be due to androgen receptors occupied by the female, minority groups, and etc. More research is needed to interpret these results because it has not been observed in this study.

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References