Research Article
Comparing Betamethasone and Dexamethasone Effects on Concentration of Male Reproductive Hormones in Mice
Jalalaldin Gooyande, Mehrdad Modaresi and Akbar Pirestani
Department of Animal Sciences, Khorasgan Branch, Islamic Azad University, Isfahan, Iran

Abstract: Most of chemical drugs have side effects on various parts of body. It is necessary to identify these effects to better use of drugs. Betamethasone and Dexamethasone are two of the most usual drugs in human and animal medication. The effect of these drugs on concentration of male reproductive hormones of mice was the goal of this study. Eighteen matured male mice were divided into eight groups including control, placebo and six treatment groups. Placebo group was received physiological serum only and treatments were Betamethasone (0.1, 0.5 and 1 mg/kg) and Dexamethasone (0.1, 0.5 and 1 mg/kg) which were injected in peritoneum every other day and for twenty days. After 20 days, blood samples were taken and FSH, LH and testosterone levels were measured using Eliza test method. Obtained data were analyzed using one way analysis of variance and mean comparison was done using Duncan’s multiple ranges test and SPSS program. Results showed that 0.5 mg/kg of Betamethasone and all levels of dexamethasone caused significant increase in FSH concentration. For LH hormone, 1 mg/kg of Betamethasone and 0.1 mg/kg of Dexamethasone caused significant decrease whereas 1 mg/kg of Dexamethasone increased it significantly. Testosterone was increased significantly by 1 mg/kg of Dexamethasone. So, mentioned drugs are effective on hormone action of reproductive system dose dependently and probable effect of them must be considered in time of using.

Keywords: Betamethasone, Dexamethasone, FSH, LH, mice, testosterone

INTRODUCTION
Dexamethasone is a synthetic glucocorticoid with 50 times more tendency than cortisol to conjunct with glucocorticoid receptor. This drug is used for preventing inflammations (Czock et al., 2005; Schacke et al., 2002). Glucocorticoids enforce a negative feedback on inflammatory responses via reducing production, secretion and action of inflammatory mediators like interleukine 1 β and are used mainly as anti inflammation matters (Kapcala et al., 1995). Direct effect of glucocorticoids on target tissue is producing sexual stroids (Rabin et al., 1990). In a study for determining various effects of Dexamethasone on inflammation of lipopolysaccharide and controlling sexual hormones in matured mice reported that Dexamethasone suppressed cortikostron level of serum but didn’t affect LH and testosterone level of serum and it controlled also the expression of interleukin 1 β and response of inflammatory system (Hedger et al., 2001). Dexamethasone causes reduction in basic level of testosterone hormone in blood and reduces its periodic secretion from 1 to 4 days after injection (Berger and Clegg, 1985). Betamethasone is a corticosteroid which is proposed for lung maturity of embryos in danger of Preterm birth. It is proposed in 24 to 34 weeks of pregnancy and has effect like reduction in appearance of respiratory distress syndrome; death caused by brain bleeding and increases in probability of live babies. Betamethasone affects pneumocytes type 2 of embryos lung and helps lung maturity via increase in Alveoli surfactants and lung compliance (Gamsu et al., 1989). Studies show that side effects of Betamethasone are highly less than Dexamethasone (Jobe and Soll, 2004; Lee et al., 2006). In a study, Betamethasone medication was studied. Results showed that it caused reduction in red blood cells and hemoglobin and increase in white blood cells especially neutrophyl which became normal after one week (Vaisbuch et al., 2002). Some researchers have recommended lately doing studies about preference of Betamethasone to Dexamethasone (Jobe and Soll, 2004). So this study was conducted to compare effects of Betamethasone and Dexamethasone on concentration of sexual hormones in male mice.

MATERIALS AND METHODS
The study was conducted in Khorasgan branch of Islamic Azad University. 80 male mice from Balb/c race and in weight range of 30±5 g were prepared and kept for two weeks in similar condition with free access to food, water, normal light and appropriate...
Injections were done for twenty days every other day and one day after last injection, blood samples were prepared using guillotine method. Eliza method and gamma counter machine were used to measure FSH, LH and testosterone hormones. The study was done in completely randomized design with... replications and obtained data were analyzed using SPSS program and Duncan’s multiple ranges test (p≤0.05) was used to compare means.

**RESULTS**

Mean comparison of FSH level in serum showed significant increase (p≤0.05) in 0.5 mg/kg of Betamethasone and Dexamethasone drugs were used each in three doses: 0.1, 0.5 and 1 mg/kg which were injected in peritoneum. Placebo group was only received normal saline 9% and control group was not injected.

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**DISCUSSION**

Considering the results, we can say that the effects of Dexamethasone and Betamethasone on reproductive hormones are dose dependent and 0.5 mg/kg of Betamethasone and 0.1, 0.5 and 1 mg/kg of Dexamethasone increased FSH concentrations but other treatments didn’t affect it significantly. In an in vitro study on female rats treated by 60-600 ng/mL of Dexamethasone, it caused synthesis stimulation and *Hockett et al. (2000)* showed in their studies which Dexamethasone didn’t affect LH concentration of cows and Phillips and Clarke (1990) reported also that Dexamethasone didn’t have any effect on LH of ewe which is in agreement with this study. Espicer et al. (2001) showed in their studies which Dexamethasone didn’t affect FSH and LH concentrations which is in opposition to previous in vitro studies on cow (Li and Wagner, 1983;
Padmanabhan et al., 1983) and rat (Suter and Schwartz, 1985) and also in vivo studies on cow (Echternkamp, 1984), rat (Tohei and Kogo, 1999) and ship (Daley et al., 2000).

One of the mechanisms which is used by hypothalamus-hypophysis-Adrenal axis to affect sexual activity is direct effect of glucocorticoids on target tissue of sexual steroids (Rabin et al., 1990). On the other hand inducing synthetic glucocorticoids can reduce hypothalamus’s gonadotropin releasing hormone considerably (Fonda et al., 1984; Dubey and Plant, 1985; Rosen et al., 1988) and control FSH and LH releasing from hypophysis (Rosen et al., 1988; Li and Wagner, 1983; Li, 1987; Brann et al., 1990; Li, 1993). Glucocorticoids control steroid making of testicles via affecting hypothalamus and hypophysis (Bambino and Hsueh, 1981) and by direct control of p450scc and 3β-hydroxysteroid dehydrogenase and p450s17 (Sapolsky, Hsueh, 1981) and by direct control of p450scc and 35β5 affecting hypothalamus and hypophysis (Bambino and Hsueh, 1981).

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