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EFFECT OF NATURAL (LUTYLASE) AND SYNTHETIC (ESTRUMATE) PROSTAGLANDINS F2 α ON SOME HORMONAL PROFILE OF SEX RABBITS

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SUMMARY

25 male and 25 female baladi rabbits were being used in the present study. All female rabbits were pretreated with hCG and the animals were divided into five aqual groups. The first group was injected with saline and served as control. The remaining four groups were injected with Lutylase; estrumate; Voltarin + Lutylase and Voltarin + Estrumate respectively. The data obtained showed that injection of both types of PGs significantly decreased prolactin level of female rabbits. In male, lutlyase has a potency to decline prolactin. Both types were antagonized by Voltarin pretreatment. Estrumate significantly increased testesterone level while lutylase has no significant effect alone but it significantly increased the level when injected with Voltarine. In females, testosterone levels were not affected by the treatments.

Both type significantly decreased progesterone level and it may be attributed to the luteclytic activity of PGs.Voltarine antagonized the effect of both types of prostaglandins. We concluded that both types were differed in alteration of hormonal levels of male and female rabbits, these different actions were obtained also after pretreatment with Voltarin specially on male testosterone level.

INTRODUCTION

Prostaglandins (PGs) are widely distributed in the central nervous system. PGs has been involved in the process of ovulation (Murdock and Dunn, 1983 and Desilva and Reeves, 1985).

There was a wide use of natural and synthetic prostaglandins in the field of reproduction. Natural as prostin F_2 α or Fluprostenol (Equimate) caused 85% luteolysis and subsequent oestrus (Mastronard; et. al., 1977. Synthetic as Cloprostenol used previously by Cerne and Nikolic (1977) in Sow; Day (1979) in cow and Jackson et. al., (1979) in sheep. Stolla and Schmid (1990) preferred natural prostaglandin in induction of myometral activity of cow.

In rabbits, Reprodin previously used by Sinkovics et. al., (1990) and it has oestrous synchronizing effect. Natural prostaglandin used also to reduce the gestation period by Ruffini et. al., (1978).

PGs have an effect on testicular function in term of spermatogenesis (Kimball et. al., 1979); gamete production (Didolkar and Roychowdhury, 1980); alteration of testosterone production (Fonda et. al., 1981) and alteration of gonadotrophin in rabbits (Agmo, 1975).

The objective of the present investigation is to make a comparison between the effect of natural (Lutylase) and synthetic (Estrumate) PGs on serum levels of prolactin; testosterone and progesterone of male and postovulatory female rabbits. Also the antagonistic effect of antiprostaglandin (Voltarin) on the hormonal levels of rabbits will be investigated.

MATERIAL AND METHODS

Fifty mature male and female Baladi rabbits were

used in the present study. The animals were fed on a ration composed of darawa as a green food beside barley and bran as a concentrated one also some vitamins, antibiotics and anticoccidial drugs were dissolved in water in minute quantities for maintenance of health. Rabbits were equally allocated into five experimental groups each consisting of five males and five females. Female rabbits were pretreated with 0.20 ml saline containing 50 i. u. human chorionic gonadotrophin hCG (Organon Holland) injected intravenously for induction of ovulation (Hafez, 1987).

Rabbits in the first group were injected intramuscularly (i.m) with 0.2 ml saline and served as control group. Each rabbit in the second group was injected (i.m.) with 0.20 ml containing 1 mg) PGF2 α (lutylase of Upjohn Comp.) three times in between 72 hours.

In the third group each rabbit was injected (i.m.) with 0.1 ml (26 ug)* Estrumate (Coopers Animal Health Limited, England) three times in between 72 hours.

Rabbits in the fourth group were injected i.m. with lutylase as in the second group and Voltarin (CIBA-GEIGY Limited Basle, Switzeriand).Injection of volltarin at a dose of 25 mg/rabbit was issued three hours before each injection of lutylase.

In the fifth group rabbits were injected with Estrumate as in the second group and Voltarin as the same regimen of the fourth group.

Individual blood samples were collected after three hours from the last injection after slaughtering the animals. Sera were obtained and stored in deep freeze at -20°C till assay.

The levels of testosterone and prolactin (male & female) and progesterone (female) were measured in the sera of rabbits using radioimmunoassay kits supplied by Leeco Diagnostic Lnc., Michigan 48075, USA.

All values represent mean ± SE. Statistical comparisons between control and treated groups were analysed using student's t-test.

RESULTS

Data represented in the table showed that the

Table (1) :The effect of Estrumate or Lutylase alone or in combination with Voltarin on prolactin; testosterone and progesterone in the sera of male and female rabbits.

Treatment	Prolactin ng/ml		Testosterone ng/ml		Progesterone ng/ml
	♂	♀	♂	♀	♀
1) Control*	3.65±0.68	4.30±0.50	1.18±0.18	0.46±0.19	2.30±0.25
2) Lutylase	1.66±0.38a	2.53±0.27a	1.68±0.82	0.29±0.07	1.40±0.10b
3) Estrumate	2.18±0.59	2.02±0.44b	2.90±0.65a	0.51±0.12	1.47±0.73a
4) Lutylase +Voltarin	3.85±0.67	2.90±0.67	3.25±0.69b	0.63±0.17	1.71±0.23
5) Estrumate +Voltarin	2.27±0.78	4.33±0.61	1.90±0.71	0.50±0.13	2.13±0.19

Mean + standard error

a: Values are significant different from respective control at $P < 0.05$

b: Values are significant different from respective control at $P < 0.01$

Control male injected with saline and control female injected with 50 I. u. hCG.

serum levels of prolactin was significantly decreased in male after injection of lutylase and in female after injection of Estrumate and Lutylase. Injection of both types of prostaglandins with Voltarin did not affect the prolactin levels in both male and female.

Testosterone levels showed a significant increase after injection of male with Estrumate and lutylase with Voltarin. All treatments did not affect female testosterone level as compared to hCG pretreated animals. Concerning progesterone levels in female animals, the data showed that both types of prostaglandins significantly decreased the level as compared to control rabbit.

DISCUSSION

The data of femals rabbits showed that the serum level of prolactin was significantly decreased after injection of both types of prostaglandins, such a result do not agree with the previous work of Sato et. al., (1974) and this may be attributed to the time of collection and the stage of corpus luteum function. It has been previously reported by Soliman et. al., (1979) that the low level of prolactin in female rabbit may be considered an indicator of corpus luteum involution and the maximal level indicated maximal secretory activity. In males lutylase have a potency to decrease prolactin level. Both types were antagonized by pretreated male and female rabbits with Voltarin. The interaction between prostaglandins and antiprostaglandins was made previously in female rabbits by Holmes et. al., (1983) and Thebault et. al., (1983) and in male rabbits by Espey et. al., (1986).

Several reports suggested that PGs may play an important role in regulation of testicular hormone levels. The data obtained showed that Estrumate significantly increased testosterone level of male rabbit, a result which agrees with Hafs and Kiser (1976) in bull and Kiser et. al., (1976) in rabbit. On the other hand, lutylase did not affect testosterone level, which agrees with the work of Fonda et. al., (1981) in boars. Injection of Voltarin with Estrumate did not affect the level of testosterons but significantly increased with lutylase. Fuchs and Chantharaksi (1981) reported that indomethacin caused a significant and sustained elevation in plasma testosterone in rats. In female rabbits, testosterone levels was not affected by PGs alone or in combination with Voltarin.

The changes of progesterone level in peripheral serum can be assumed to reflect similar changes in the rate of progesterone secretion (Ochial et. al., 1981). The data obtained showed that both types of PGs significantly decreased progesterone level, which agrees with hafs and manns, (1975) in cow and Ochial and Rothchild (1985) in rat. The decline in progesterone level may be due to the luteolytic property of PGs as previously discussed by Niswender et. al., (1976) through the vasoconstrictive effect (McCracken, 1980) or by stimualtion of proteolytic enzymes (Miyazaki et. al., 1991). PGs in combination with Voltarin do not affect the progesterone level that may indicate sustained action of hCG in induction of ovulation and corpus luteum function as previously reported by Hafez (1987).

We can conclude from the data that synthetic and natural prostaglandins may be asymetric in inducing variation of hormonal levels and the antagonizing effect of antiprostaglandins were differed specially in alteration of male testosterone levels.

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