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Effect of CIDR Application Duration (7-10-14 Days) on Circulating Estrogen and Progesterone during Breeding and Non- Breeding Season in She-Camels

Fekry M. Hussein[1], Kamal K. Metwelly[1], Mona, A. Mahmoud[2] and Mohamed H. Ragab[2]
[1]Theriogenology Department Faculty of Veterinary Medicine, Alexandria University, Egypt.
[2]Animal Health Department, Animal Production Division, Desert Research Center, Egypt

Key words
CIDR, Circulating Estrogen Progesterone, She-Camels

ABSTRACT:
This work aimed to study the effect of CIDR (Controlled Internal Drug Release) time application during breeding and non-breeding season on estradiol and progesterone profile in she camels. Nine healthy one humped she camels (*Camelus Dromedaries*) were randomly assigned to one of the three treatment groups during breeding and non- breeding season. All animals were synchronized with (CIDR impregnated with 1.38 progesterone was inserted vaginally. Group 1 animals (*n*= 3): CIDR was inserted for 7 days. Group 2 animals (*n*= 3): CIDR was inserted for 10 days. Group 3animals (*n*= 3): CIDR was inserted for 14 days. Blood samples (10ml) were withdrawn from jugular vein of each female camel into dry vacutainer tubes at days 3, 5, 7 and 7 for group (1) 3,5,7, and 9 after for group (2) and 3,5,7,9,11, and 13 for group(3). During breeding season, the overall progesterone profile (ng/ml) after CIDR application for 10 days was highest (7.68±0.77ng/ml) compared to overall progesterone profile (6.04±1.7 ng/ml and 6.99±0.45ng/ml) after CIDR application for7 and 14 days, respectively. The overall progesterone profile was fairly the same during non- breeding season. The overall estradiol profile after CIDR application for 10 days was highest (51.27±4.11pg/ml) compared to overall estradiol profile (46.42±11.08pg/ml and 19.27±3.8pg/ml) after CIDR application for7 and 14 days, respectively during breeding season. Statistical analysis revealed significant effect (P<0.05). Similarly, during non- breeding season the overall estradiol profile after CIDR application for 10 days was highest (49.75±8.6pg/ml) compared to overall estradiol profile(17.7±0.87pg/ml and 21.03±4.1pg/ml) after CIDR application for7 and 14 days, respectively. Statistical analysis revealed significant effect (P<0.05).In conclusion, the use of exogenous progesterone did not synchronize wave emergence in camels as follicular waves continued to emerge during the period of treatment.

Corresponding Author: Fekry M. Hussein:fekryhussein2@hotmail.com

1. INTRODUCTION

Reproductive efficiency and fertility are considered to be poor in dromedary camels. According to field surveys, calf birth rate barely exceeds 40% in traditional management system. However, end of season pregnancy rate can reach 50–80% with improved nutrition and reproductive management (Tibary et al., 2005). AbouEla, 1994 reported 58% pregnancy rate at first estrus after repeated natural mating in the same estrus period. In a study cited by Tibary et al. (2005), conception rates were 38% after one breeding and 64% after two breedings with intensive reproductive management. Such programs include regular monitoring of follicular activity by palpation per rectum and ultrasonography that require significant amount of time and effort. Hence, ovarian synchronization protocols were developed in many domestic species. In cattle, several protocols including Ovsynch, Presynch, Cosynch etc. have been applied successfully worldwide (Macmillan, 2010; Pursley et al., 1997; Rabiee et al., 2005; Thatcher and Santos, 2007).Several protocols have been designed to control follicular growth in dromedary camels. These methods include: induction of ovulation with exogenous gonadotropin releasing hormone analog (Nikjou et al., 2008; Skidmore et al., 2009) and simulation of a luteal phase, either by daily subcutaneous injections of progesterone (P4) or by intra vaginal devices (Skidmore et al., 1992; Cooper et al., 1992; Skidmore, 1994). Since there is a paucity of knowledge on the effect of exogenous progesterone on circulating estrogen and progesterone during treatment in dromedary camels, this study aimed to study the effect of CIDR (Controlled Internal Drug Release) time application during breeding and non-breeding season on estradiol and progesterone profile in she camels.

2. MATERIAL AND METHODS

This study was carried at Matrouh Research Station, belonging to the Desert Research Center, Ministry of Agriculture in cooperation with the Department of Theriogenology, Faculty of Veterinary Medicine, and Alexandria University. Nine healthy one humped she camels (Camelus Dromedaries) were used. The animals were 9- 13 years old, with average body weight 450±17.3kg and each three animals allocated in isolated pen partially cover for shade. They were fed a maintenance ration composed of a concentrate mixture at the rate of 3-5kg/head/day in addition to barseem hay. Fresh water was presented once daily in mid-day. Each female camel was randomly assigned to one of the three treatment groups during breeding season (November-April) and non- breeding season (May-October).

All animals were synchronized by using a controlled internal drug release (CIDR) insert (EAZI-BREED, inter Age, Hamilton, New Zealand) impregnated with 1.38 progesterone was inserted vaginally after cleaning and washing the perineum region with water and povidine – iodine based detergent solution, moreover, antibiotics was added during application of CIDR(10 ml tetracycline) into each animal. Group 1 animals (n= 3): CIDR was inserted for 7 days. Group 2 animals (*n*= 3): CIDR was inserted for 10 days. Group 3animals (*n*= 3): CIDR was inserted for 14 days. Blood samples (10ml) were withdrawn from jugular vein of each female camel into dry vacutainer tubes at days 3, 5, 7 and 7 after CIDR application for group (1) 3, 5, 7, and 9 after CIDR application for group (2) and3, 5, 7,9,11, and 13 after CIDR application for group (3). Blood samples were allowed to clot overnight at 4°C. The serum was separated by centrifugation at 3000 rpm for 20 minutes and then stored at -20°C until hormonal assay.

Progesterone assay

The concentration of progesterone in the serum was determined by solid phase

Enzyme immunoassay kits obtained from DRG instruments GmbH, Germany Division of DRG International, Inc. (Katt et al., 1985).

Estradiol assay

The concentration of Estradiol in the serum was determined by solid phase

Enzyme immunoassay kits obtained from DRG instruments GmbH, Germany Division of DRG International, Inc. (Ratcliff and Carter, 1988).

Statistical Analysis:

Data are presented as means±S.E. and the analysis was conducted using SPSS

Program version 16 (2007). Differences among groups were evaluated by ANOVA And t-test were used to compare between levels of hormones in animals.

3. RESULTS

As shown in Table.1 there are no significant differences ($p>0.05$) between progesterone profile (ng/ml) during CIDR application duration (7-10-14 days) during breeding season in she-camels. The overall progesterone profile (ng/ml) after CIDR application for 10 days was highest (7.68±0.77ng/ml) compared to overall progesterone profile (ng/ml) (6.04±1.7 ng/ml and6.99±0.45ng/ml) after CIDR application for7 and 14 days, respectively. The effect of CIDR application duration (7-10-14 days) on progesterone profile (ng/ml) during non-breeding season in she-camels are shown in Table 2

Regarding the effect of CIDR application duration (7-10-14 days), the overall progesterone profile (ng/ml) was fairly the same during non-breeding season. Statistical analysis revealed no significant effect ($P>0.05$). The effect of CIDR application duration (7-10-14 days) on estradiol profile (pg/ml) during breeding season and non-breeding season in she-camels are shown in Table 3, 4

Regarding the effect of CIDR application duration (7-10-14 days) during breeding season the overall estradiol profile(pg/ml) after CIDR application for 10 days was highest (51.27±4.11pg/ml) compared to overall estradiol profile (pg/ml) (46.42±11.08pg/ml and 19.27±3.8pg/ml) after CIDR application for7 and 14 days, respectively during breeding season. Statistical analysis revealed significant effect ($P<0.05$).

Similarly, during non- breeding season the overall estradiol profile (pg/ml) after CIDR application for 10 days was highest (49.75±8.6pg/ml)compared to overall estradiol profile (pg/ml) (17.7±0.87pg/ml and 21.03±4.1pg/ml) after CIDR application for7 and 14 days, respectively during non- breeding season. Statistical analysis revealed significant effect ($P<0.05$).

Table 1.Effect of CIDR application duration (7-10-14 days) on progesterone profile (ng/ml) (mean ±SE) during breeding season in she-camels

Days	CIDR (7)	CIDR(10)	CIDR(14)
D3	5.82±0.22b	9.61±0.04a	8.616±0.59a
D5	8.19±0.349a	8.04±0.58a	8.13±0.47a
D7	9±.036a	7.6±0.04b	7.45±0.47b
D9	-	4.88±0.32b	6.97±1.59a
D11	-	-	6.44±0.89
D13	-	-	5.10±0.19
Overall means	**6.04±1.7a**	**7.68±0.77a**	**6.99±0.45a**

Means in the same row carry different small letters are significantly different (P<0.05)

Table 2.Effect of CIDR application duration (7-10-14 days) on progesterone profile (ng/ml) (mean ±SE) during non-breeding season in she-camels

Days	CIDR (7)	CIDR(10)	CIDR(14)
D3	4.47±.0.20a	4.51±0.17a	5.98±0.15a
D5	3.92±0.17a	4.46±0.03a	6.85±1.2b
D7	2.06±0.66b	3.03±0.92b	6.11±0.72a
D9	-	4.78±0.4b	6.83±0.93a
D11	-	-	5.12±0.31
D13	-	-	4.89±0.24
Overall means	**4.01±0.74a**	**4.25±0.31a**	**5.79±0.33a**

Means in the same row carry different small letters are significantly different (P<0.05)

Table 3.Effect of CIDR application duration (7-10-14 days) on estradiol profile (pg/ml) (mean ±SE) during breeding season in she-camels

Days	CIDR (7)	CIDR(10)	CIDR(14)
D3	35.15±0.23a	40.21±20.8a	7.79±1.77b
D5	20.75±1.09b	57.60±9.4a	20.86±8.1b
D7	63.22±1.67a	48.46±21.8b	20.33±7.21c
D9	-	46.70±13.4a	20.53±5.66b
D11	-	-	19.52±8.54
D13	-	-	38.27±16.44
Overall means	**46.42±11.08a**	**51.27±4.11a**	**19.27±3.8b**

Means in the same row carry different small letters are significantly different (P<0.05)

Table 4.Effect of CIDR application duration (7-10-14 days) on estradiol profile (pg/ml) (mean ±SE) during non-breeding season in she-camels

Days	CIDR (7)	CIDR(10)	CIDR(14)
D3	19.62±4.7b	57.43±2.37a	11.06±2.14c
D5	15.64±6.97b	48.74±7.63a	15.78±3.55b
D7	17.01±6.18b	59.5±12.17a	18.84±2.7b
D9	-	66.2±8.7a	18.99±5.04b
D11	-	-	37.13±20.97
D13	-	-	35.30±4.03
Overall means	**17.7±0.87b**	**49.75±8.6a**	**21.03±4.1b**

4. DISCUSSION

Low reproductive efficiency of the camel had been reported in several studies (Nawito et al., 1967; Saley, 1990; Djellouli and Saint-Martin, 1992; Abdel-Rahim et al., 1994; El-Azab et al., 1997; Musa et al., 2000 and Kaufmann, 2005). Nevertheless, there is a dearth of information on causes/ sources of low reproductive performance in this important species, this is why it has become increasingly important to understand the physiology of reproduction in this species so that good management and the use of assisted reproductive techniques, such as embryo transfer and artificial insemination, can be used to try and improve their reproductive efficiency. This study aimed to study the effect of CIDR (Controlled Internal Drug Release) time application during breeding and non-breeding season on estradiol and progesterone profile in she camels.

The use of exogenous progesterone for controlling the ovulation has been documented in dromedary camel (Roche, 1976; Mckinnon and Tinson, 1992; Cooper et al., 1992; McKinnon et al., 1994 and Skidmore, 1994) in Bactrian camels (Nikjou et al., 2008) in IIama (Chaves et al., 2002)

In this work there are no significant differences ($p>0.05$) between progesterone profile during CIDR application duration (7-10-14 days) during breeding season in she-camels. The overall progesterone profile (ng/ml) after CIDR application for 10 days was highest (7.68±0.77ng/ml) compared to overall progesterone profile (6.04±1.7 ng/ml and 6.99±0.45ng/ml) after CIDR application for7 and 14 days, respectively. Regarding the effect of CIDR application duration (7-10-14 days), the overall progesterone profile was fairly the same during non-breeding season. Statistical analysis revealed no significant effect ($P>0.05$). These results agreement with. Macmillan, et al (1991). Claimed that plasma progesterone concentrations in ovariectomized heifers were maintained at levels equivalent to those found in dioestrous heifers for the first 3 days of the device insertion only. In addition, previous reports indicate that medroxyprogesterone acetate sponges are effective in negatively influencing oestradiol-17_ production until day 5 post-insertion, where after, concentrations slowly increase despite hormonal treatment (Aba et al., 1999). Moreover (Chaves et al., 2002) stated that in IIama a rapid increase in plasma progesterone concentration immediately after the insertion of intravaginal device .Thereafter progesterone concentration sharply decreased until day 3where after concentrations slowly decreased until basal values were registered on day 11-13 post insertion.

In the present study the effect of CIDR application duration (7-10-14 days) during breeding season the overall estradiol profile after CIDR application for 10 days was highest (51.27±4.11pg/ml) compared to overall estradiol profile(46.42±11.08pg/ml and 19.27±3.8pg/ml) after CIDR application for7 and 14 days, respectively during breeding season. Statistical analysis revealed significant effect ($P<0.05$).

Similarly, during non- breeding season the overall estradiol profile after CIDR application for 10 days was highest (49.75±8.6pg/ml) compared to overall estradiol profile(17.7±0.87pg/ml and 21.03±4.1pg/ml) after CIDR application for7 and 14 days, respectively during non- breeding season. Statistical analysis revealed significant effect ($P<0.05$).These results agree with (Chaves et al.,2002) reported that in IIama, the estradiol concentrations decreased drastically by day one post insertion of CIDR and remain low until day 6,when they started to increase again. In addition, these results suggested that the use of exogenous progesterone did not synchronize wave emergence in camels as follicular waves continued to emerge during the period of treatment these results agree with Skidmore, 1994; Chaves et al., 2002 and Nikjou et al., 2008. Moreover, the use of PRIDs in camels not only caused vaginal discharges in some animals, but also a high proportion of recipients ovulated whilst carrying the PRIDs *in situ* and another significant proportion failed to ovulate at all after a further injection of GnRH (Skidmore et al., 1992; Cooper et al., 1992and Skidmore et al., 2009) in addition endogenous progesterone dose not completely control ovarian activity in dromedary camel ;it is reported that mature follicles can be found until 105 days of pregnancy (El-Wishy et al.,1981).

4. CONCLUSION

Use of exogenous progesterone did not synchronize wave emergence in camels as follicular waves continued to emerge during the period of treatment.

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