Effect of months on levels of serum estradiol and progesterone hormones in the one- humped camel (*Camelus dromedaries*)

M. A. Shahooth
Collage of Medicine\ University of Anbar

Abstract

This study was conducted at the Animal Farm, College of Veterinary Medicine, University of Anbar during the period from September, 2012 to January, 2013. This experiment included 12 multiparous, non-lactating Iraqi one-humped female camels (*Camelus dromedarius*) of 7-8 years old. Blood sample were collected and Radioimmunoassay (RIA) used to measure the plasma estradiol-17β (pg/ml) and plasma progesterone concentration (ng/ ml). Higher level ($P<0.05$) plasma estradiol-17β in October (35.75 ± 2.019) and the lower during December, September and November (31.83 ± 3.094, 31.33 ± 2.533 and 31.17 ± 2.160) respectively. Plasma Progesterone concentration were significantly ($P<0.05$) higher during December (1.309 ± 0.514), than September, October and November (0.724 ± 0.080, 0.641 ± 0.090 and 0.608 ± 0.116). It was concluded that there is a clear effect of months on levels of serum estradiol and progesterone in the one- humped camel.

Keywords: Camel, serum estradiol and progesterone hormones, months

تأثير الأشهر على مستويات هرموني الاستراديول والبروجستيرون في إناث الابل وحيدة السنام

محمد علي شاحوذ
كلية الطب/ جامعة الأنبار

الخلاصة

أجريت الدراسة في الحقل الحيواني التابع إلى كلية الطب البيطري جامعة الأنبار للفترة من أيلول 2012 ولغاية كانون الثاني 2013. شملت الدراسة على 12 أنثى من الابل وحيدة السنام العراقية تراوحت أعمارها (7–8) سنوات. تم جمع عينات وتم قياس الهرمونات الاستراديول والبروجستيرون بواسطة جهاز المقياس المناعي الشعاعي. ارتفع مستوى هرمون الاستراديول بيتا 17 بصورة معنوية ($P<0.05$) في تشرين الأول (35.75 ± 2.019) وانخفض في كانون الأول، أيلول وتشرين الثاني (31.83 ± 3.094، 31.33 ± 2.533 و31.17 ± 2.160) على التوالي. ارتفع مستوى هرمون البروجستيرون بصورة معنوية ($P<0.05$) خلال كانون الأول (1.309 ± 0.514) عن الأشهر أيلول، تشرين الأول وتشرين الثاني (0.724 ± 0.080، 0.641 ± 0.090 و0.608 ± 0.116). يمكن الاستنتاج أن لأشهر السنة تأثير واضح على مستويات هرمونات الاستراديول والبروجستيرون في إناث وحيدة السنام.

الكلمات المفتاحية: إبل، هرمون الاستراديول والبروجستيرون، الأشهر.

Introduction

The breeding season occurs within the period from October to May and varies from region to another (1). Dromedaries are polyestrus animals, and the breeding activity occurs more often during particular periods of the year (2). In camels near the equator, factors such as rainfall, nutrition and management may overcome the effects of photoperiod and allow for breeding throughout the year (3). In Iraq, Al-Delemi (4) showed that the reproductive season extends from (December till April), and that the peak of reproduction is reached in January. The change in oestradiol-17β and progesterone (during the non-breeding season) is indicative of actual induction and follicular growth, post-treatment (5). The present study aimed to investigate the effect of months on levels of serum estradiol and progesterone hormones in the one- humped camel.

Materials and Methods

This study was conducted at the Animal Farm, College of Veterinary Medicine, University of Anbar during the period from September, 2012 to January, 2013. This experiment included 12 multiparous, non-lactating Iraqi one-humped female camels (*Camelus dromedarius*) of 7- 8 years old, and average body weight of 450-500 kg.

Blood sample (10 ml) were collected via jugular vein with heparinized vacutainer tubes. Radioimmunoassay (RIA) used to measure the plasma estradiol-17β (pg /ml) and plasma progesterone concentration (ng/ ml). The kit provided by Immunotech, A Beckman Coulter Company, de Lattre de Tassigny, Marseille, France. The assay carried out at Al-Nadhaer Clinical Laboratory, Baghdad.

Statistical analysis: The data were presented as means ± S.E. and subjected to analysis by using one way of analysis (ANOVA) post hoc test was used LSD ($P<0.05$), the software was used package IBM SPSS program, version 20. (6).

Results and Discussion

The results showed higher level ($P<0.05$) of plasma estradiol-17β in October (35.75 ± 2.019) and the lower during December, September and November (31.83 ± 3.094, 31.33 ± 2.533 and 31.17 ± 2.160) (Table 1). These results are not agreed with those observed by (2, 4, 7).

The main sources of serum estrogens are the Graafian follicles, and it has been reported to be higher during winter (19.39%) and spring (27.48%) than in summer (6.66%) or autumn (6.88%) (8). It is hypothesized that decreasing light hours and probably low temperature might be instrumental in triggering the hypothalamic hypophysical axis as it observed in other short day breeders like sheep (9).

The effects of the different months on the Plasma Progesterone concentration showed that the concentration significantly ($P<0.05$) higher during December (1.309 ± 0.514), than September, October and November (0.724 ± 0.080, 0.641 ± 0.090 and 0.608 ± 0.116) respectively. These results are not agreed with those observed by (2, 4, 10, 11). It is well known that the progesterone is secreted from the corpus luteum on the ovary and its level in the blood varies with the functional activity of the corpus luteum or phases of the oestrous cycle, the camel breeding season, so it is possible that such phenomena also occur in camel and its incidence might have been higher during December than other months (2).

Table (1) Effect of months on levels of serum estradiol and progesterone hormones in the one- humped camel (mean ±S.E).

Month	Plasma estradiol-17β concentration (pg /ml)	Plasma Progesterone concentration (ng /ml)
September	31.33 ± 2.533 B	0.724 ± 0.080 B
October	35.75 ± 2.019 A	0.641 ± 0.090 B
November	31.17 ± 2.160 B	0.608 ± 0.116 B
December	31.83 ± 3.094 B	1.309 ± 0.514 A

Means with different superscripts within each column differ significantly (p<0.05).

References

1. Gordon, I. (2004). Reproductive Technologies in Farm Animals. CABI Publishing, USA. pp. 26, 220- 227.
2. Ali, S. (2006). Studies on ovarian follicular morphology, serum biochemical and hormonal profiles in female camel (*Camelus dromedarius*) during the low and the peak breeding seasons. PhD thesis. University of Agriculture, Faisalabad, Pakistan.
3. Ptaszynska, M. (2003). Compendium of Animal Reproduction. Publisher Intervet International BV, 8th revised edn., p. 235.
4. Al- Delemi, D. H. J. (2007). Anatomical, Physiological, Bacteriological and Pathological study of the reproductive system of Iraqi She- Camels (*Camelus dromedaries*). Ph.D. Thesis, College of Veterinary Medicine, University of Baghdad.
5. Ismail, S. T.; Azab, G. A.; Abdoon, A. S. S. & El-Belely, M. S. (1993). New approach for superovulation and embryo recovery in the one humped camel. Veterinary Medical Journal, Giza, 41: 47-52.
6. Snedecor, G. W. & Cochran, W. G. (1989). Statistical methods. 7th (ed.)., Iowa State University Press.
7. Ali, S.; Ahmad, N.; Akhtar, N.; Rahman, Z. & Ahmad, M. (2011). Hormonal profiles in the serum and follicular fluid of female camel (*Camelus dromedarius*) during the peak and the low breeding season. Pak. Vet. J., 31 (4): 331- 335.
8. Shalash, M. R. (1965). Some reproductive aspects in the female camel. World Rev. Anim. Prod., 4: 103-109.
9. Turrek, F. W. & Campbell, C. S. (1979). Photoperiodic regulation of neuroendocrine gonads activity. Biol. Repod., 20: 32-50.
10. Babiker, E. A.; Ahmed, A. I.; Husna M. E. & Abdel-Aziz B. E. (2011). Serum testosterone and progesterone levels and ovarian activity as indicators for seasonal breeding in dromedary camels in Sudan. Research Opinions in Animal & Veterinary Sciences (ROAVS), 1 (5): 309-312.
11. Elias, E., Bedrak, E. & Yagil, R. (1984). Estradiol concentration in the serum of the one humped camel (*Camelus dromedarius*) during the various reproductive stages. Gen. Comp. Endo., 56: 258-264.