

HORMONAL TREATMENTS FOR INDUCING FERTILE OESTRUS IN YOUNG DROMEDARY FEMALES AT THE END OF THEIR SEASONAL ANOESTRUS IN QUSEEM REGION, SAUDI ARABIA

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ABSTRACT

Young females of local one humped camels were stimulated to initiate oestrus and ovulation when the females were in the interface between anoestrus and cyclic periods. Eighteen young females, approximately 3 years old, were randomly allotted to three equal groups: Group 1: treated with Controlled Internal Drug Release (CIDR) device for 17 days plus one intra-muscular injection of 3000 i.u. Pregnant mare's serum gonadotropin (PMSG) at the time of removing the CIDR; Group 2: CIDR for 17 days plus an injection of prostaglandin $F_2\alpha$ ($PGF_2\alpha$) at the time of CIDR withdrawal and Group 3: untreated animals (the control). All the females in the first group showed oestrus approximately 48 hours post PMSG injection. Only two females of the second group showed oestrus 3 days post $PGF_2\alpha$ injection and no one showed oestrus from the third group. All the females that showed oestrus were naturally bred by a breeding male. The pregnancy rate was tested by observing the female raising tail behaviour about 25 days post male introduction and confirmed by both measuring blood progesterone concentration and also diagnosed by using real-time ultrasonography technique. There was a significant difference ($p < 0.01$) between the females in the three groups in terms of showing oestrus and pregnancy rates. The pregnancy rate was 50, 17 and 0% in the first, second and third groups, respectively.

Keywords : Dromedary female camel, hormonal treatment, inducing fertile oestrus, reproduction, Saudi Arabia, seasonal anoestrus

In general, the dromedary camels have poor reproductive performance because they have short breeding season with long period of lactation anoestrus (Minoia *et al*, 1992) and reach puberty and maturity in late ages, about 4 to 5 years (Evans and Powys, 1979; Mares, 1954 and Yasin and Wahid, 1957). Although a three years old female can reproduce, however, their fertility at this age is low (Novoa, 1970).

Camels are seasonal breeders (Yasin and Wahid, 1957). In Quseem region of Saudi Arabia, the breeding season of camels is from November to March (Abdel Rahim *et al*, 1994). The camels can reproduce and calf during the period of low temperature, rain and better grazing condition (Tibary and Abdelhack, 1997). In the male, testosterone levels increase during the breeding season and this affect the male libido and his semen characteristics. The female of dromedary

camel may show low reproductive activity and become pregnant during their out of breeding season, however, the embryonic loss and percentage of newborn survival is low.

There is no spontaneous ovulation in the camel (Musa, 1979). Therefore, without mating, there is no luteal phase. Homeida *et al* (1988) measured the peripheral plasma concentration of progesterone and total oestrogen in female camels for a complete oestrus cycle (23.1 ± 1.2 days) and concluded that the oestrus cycle in the camels was mostly follicular and the luteinising hormone (LH) surge was absent. This indicated a failure of subsequent luteal phase in this species. Ovulation in camels usually occurs 30-48 hours following copulation (Musa and Abusineina, 1978). The female in heat usually appears restless, has swollen vulva and sits for mating. When they become pregnant, they usually raise their tails

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25 days post mating when the male gets closer to them (Abdel Rahim and El-Nazier, 1992). In the past, camels depend only on the pasture to get their nutrient requirements, which are not always adequate. For this reason, camels can not reproduce annually but every other year. In addition, camel breeders prefer their camels to calf every other year for two reasons. First, they want to ensure the soundness of their camels which is negatively affected by pregnancy especially when their animals have exposure to poor nutrition. Second, because they depend on camel's milk so they want their camels to lactate for several months and this finally can interrupt with reproductive activity. In the recent years, camels are raised under semi-intensive system where they are supported with roughages and concentrates during the dry season. Therefore, using hormonal treatments for enhancing puberty and inducing oestrus and ovulation in young females can increase the efficiency of reproduction in camels. The objective of this study was to evaluate the ability of inducing fertile oestrus in young camel females during their seasonal anoestrus period.

Materials and Methods

This experiment was started on August 14, 2001 in Qusem Region, Saudi Arabia. At that time of the year, the climate was still very hot. The temperature of the environment during the daytime was between 38-42°C. Eighteen young local dromedary females approximately 3 years old were used in the experiment. They were in good health, free of diseases, parasites and in good body condition. All the females were vaccinated and dewormed three weeks prior to the beginning of the experiment. Each female was identified with a plastic ear tag to ensure keeping accurate breeding records. They were fed alfalfa hay and provided with minerals and water. The animals were randomly allotted into three equal groups. The first and second groups were inserted with the Controlled Internal Drug Release (CIDR) device which is a y-shaped device, covered with an elastomer containing 1.9 grams of natural progesterone and connected with a plastic tab, which enables its withdrawal. The CIDR's were inserted into the vagina by a specific applicator and left for 17 days. At the time of their removal, female of the first group were given

an intramuscular injection of 3000 i.u. pregnant mare's serum gonadotropin (PMSG). Females of the second group were infected with 3 ml prostaglandin $f_2\alpha$ ($PGf_2\alpha$) at the time of removing the CIDRs. The third group (the control) had no hormonal treatment. All the female camels were kept together in a large pen. After 24 hours of CIDR removal, one mature approximately 6 years old male was introduced to the females and left with them for three days. Pregnancy was determined by measuring progesterone level in the blood on day 25 post male introductions.

Results and Discussion

Induction of oestrus and ovulation in camels during the non-breeding season can be achieved (Elias *et al*, 1985). However, the fertility rate of this oestrus may be low. Elias *et al* (1985) gave high dose of PMSG, 7000 i.u., for inducing oestrus in 7 females during their seasonal anoestrus. However, they concluded that no pregnancy occurred and that failure was probably due to inadequate luteal function. In this study low dose of 3000 i.u. PMSG following progesterone treatment gave good results (table 1). All the females showed oestrus approximately 2 days post PMSG injection and half of them became pregnant. On the other hand, only 2 females in the second group exhibited oestrus and one of them became pregnant. The females of the third group failed to show oestrus. The male showed a normal sexual activity especially in the second and third days of its introduction. The results of this experiment indicates that hormonal treatment can be used as a tool for inducing oestrus and ovulation of young females during the anoestrus period. In addition, the male camel can exhibit sexual behaviour when there are females in oestrus.

Only the pregnant females raised their tails when the male introduced to them after

Table 1. Oestrus and pregnancy results.

Groups	Treatments	Number of females showed oestrus	Number of pregnant females
1	CIDR for 17 days + PMSG	6	3
2	CIDR for 17 days + $PGF_2\alpha$	2	1
3	No treatment (control)	0	0

25 days of their breeding. Serum progesterone concentrations were greater than 2.5 ng/ml and less than 0.7 ng/ml in the pregnant and open females, respectively. The accuracy of rectal real-time ultrasonic examination on day 25 diagnosing pregnant and non-pregnant females was 25 and 100%, respectively. The embryonic fluids were only clearly seen in one female. These facts indicated that the raising tail behaviour can be taken as a useful sign of pregnancy. It is well known by the local camel breeders that a pregnant female will raise her tail and head when a mature male is introduced approximately 15-25 days post successful mating.

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