

## Effect of Ivermectin on Progesterone Profile in the Camel (*Camelus dromedarius*)

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### ملخص البحث

أجريت هذه التجربة لمعرفة، العلاقة أن وجدت، بين عقار اليفرمكتين و مستوى هرمون البروجسترون في الناقة. جمعت عينات من الدم من أربعة من النوق تتراوح أعمارها من 8-12 سنة وأوزانها من 390-450 كجم لفترة 35 يوما في فترات متراوحة بين كل منها 5 أيام. حققت النوق تحت الجلد بجرعتين مختلفتين من العقار بمعدل 150 و 200 ميكروجرام/كجم من الوزن الحي. قيس معدل الهرمون قبل وبعد المعالجة بالعقار بواسطة تقنية النظائر المشعة (RIA). لوحظ ارتفاع معدل الهرمون في ثلاثة من النوق الأربعة عند حقن العقار خلال فترة التناسل وانخفاضه في تلك التي حققت بعد أو قبل فترة التناسل.

### Summary

This study was conducted to understand the relationship, if any, between the administration of Ivermectin and the serum progesterone profile in the female camel. Blood samples were collected for 35 days at 5 days intervals from four female camels aging 8-12 years and weighing between 390 and 450 kg. Two different doses of Ivermectin were administered subcutaneously at 150 µg/kg and 200 µg/kg body weight. Progesterone level was measured before and after injection of the drug using radioimmunoassay (RIA). At least three out of the four animals showed an observable increase in progesterone when Ivermectin was administered within the breeding season, while those injected outside the season showed decreased levels of progesterone.

### Introduction

The camel (*Camelus dromedarius*) is of great economic importance in Arab countries and other developing areas. However, it has relatively unknown reproductive physiology compared to other domestic animals. Earlier reports showed that the female camel is a seasonal polyoestrous animal that does not ovulate spontaneously and, therefore the luteal phase only appears after a successful mating (Abdalla, 1960; Chen and Yuan, 1979; Musa, 1979). During the breeding season the ovarian activity is restricted only to follicular development. In Sudan Musa (1969) performed serial rectal palpation, year round, on five unmated female camels and noted the occurrence of six follicular, unovulatory oestrous cycles from December to July. Each

cycle is characterized by a period of growth, maturation and regression of an ovarian follicle, which lasted for 6, 13 and 8 days respectively. This seasonal ovarian activity was followed by anoestrous of six-month duration. The period of sexual activity in the female camel coincides with the rut season of the males. Abdel Rahim and El Nazier (1987) reported that the level of progesterone is more than 5 ng/ml in pregnant animals, whereas in non-pregnant animals its concentration falls below 1ng/ml.

Ivermectin is naturally occurring compound produced by fermentation of the soil-dwelling Actinomycete *Streptomyces avermitilis*. It is an endectocide compound with exceptional potency and broad nematode and arthropod spectrum of activity (Mckellar and Benchaoui, 1996).

Following the observations of Shaddad (1997) that ivermectin induced an increase in progesterone level in ewes, we decided to conduct this study to investigate changes, if any, that may occur in progesterone level in female camels following the administration of ivermectin.

#### **Materials and Methods**

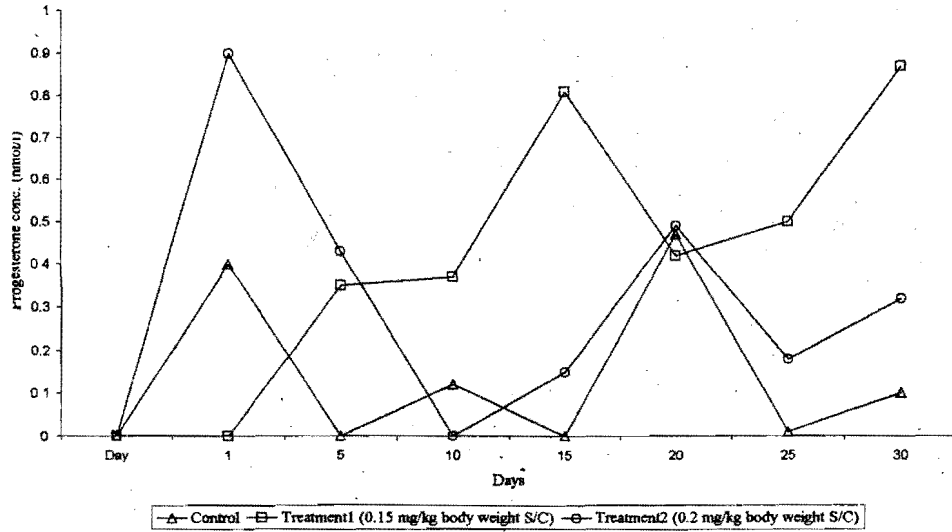
Four female camels (S, F, R and A) used in this study were aged from 8-12 years old and weighed between 390 and 450 kg.

#### **Protocol of treatments :**

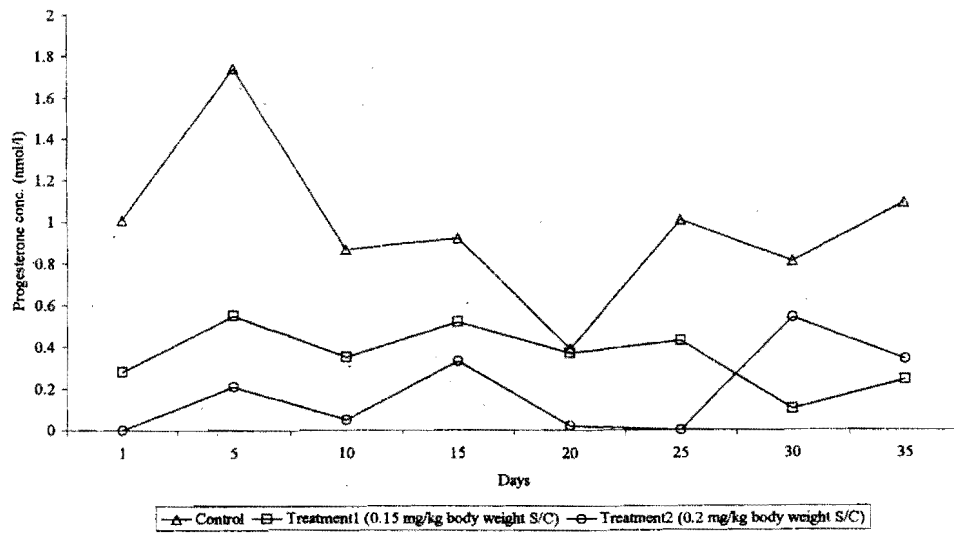
Blood samples were taken from the jugular vein at 5 day intervals for 35 days on March 1997. The progesterone level of the sera was assessed to be as control group. Then, treatment with ivermectin was injected subcutaneously at two intervals. The first one was in May (treatment 1) at adose of 150 µg/kg b.w. and the second one in September (treatment 2) at 200 µg/kg b.w. After each treatment, blood was collected from the jugular vein at 5 day intervals for 35 days to assay progestrone level. The radio-immunoassay technique (RIA) was followed according to FAO/IAEA(1993).

#### **Results and Discussion**

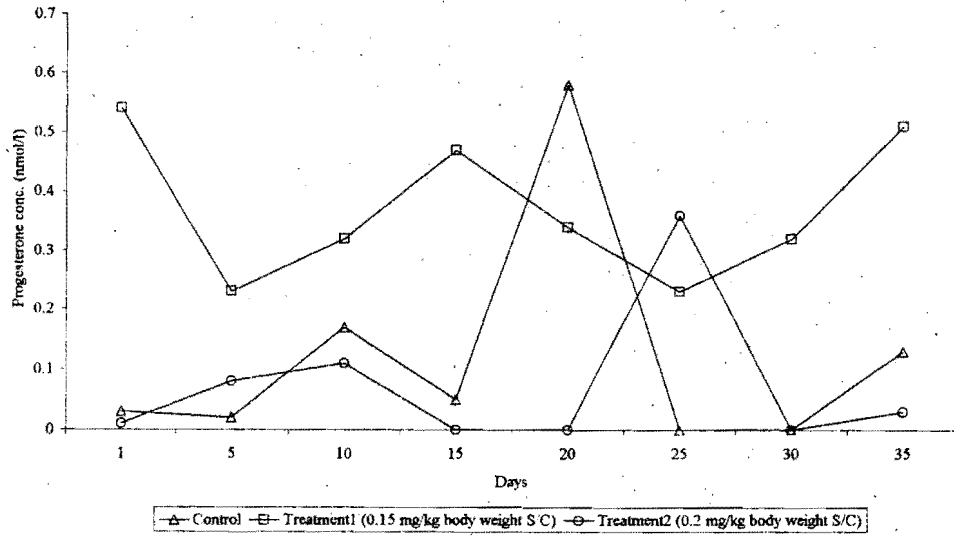
Figs.(1-4) show the patterns of progesterone secretion during 35 days for the control and the other treated groups. They also show that at least 2-3 peaks of progesterone level occurred. However, there is a variation between the animals in the pattern of progesterone release and in the duration of these cycles. This observation was also reported by



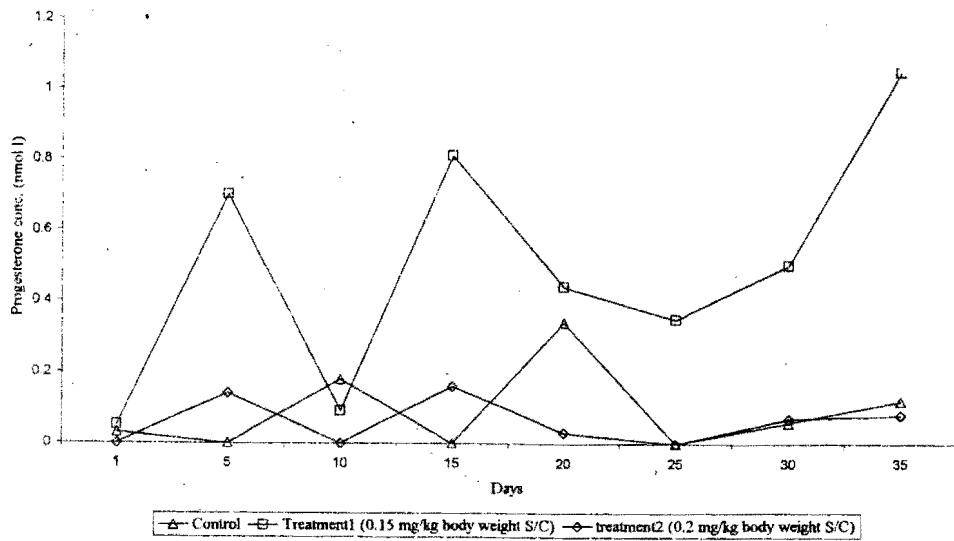
**Fig.1: Effect of Ivermectin on serum progesterone profile in animal (S)**



**Fig.2: Effect of Ivermectin on serum progesterone profile in animal (F)**



**Fig.3: Effect of Ivermectin on serum progesterone profile in animal (R)**



**Fig.4: Effect of Ivermectin on serum progesterone profile in animal (A)**

Abdel Rahim (1989) and FAO (1982). In three out of the four animals the progesterone profile was higher in the samples taken in May, when the animals were injected subcutaneously with 0.15mg/kg b.w. of ivermectin, than in those taken from the control group in March. In one camel (F) the progesterone level decreased, although the breeding season for camels in the Sudan was reported to be from December to July (Musa, 1979). In this study the increase in progesterone level in the three animals may be due to ivermectin injection since the control and the treated groups were all sampled during the breeding season, such results were in agreement with those reported by Shaddad (1997) in ewes. In the four animals the progesterone profile was higher in the samples taken in May when animals were injected subcutaneously with 150 µg/kg b.wt of ivermectin. Such differences may be explained by the seasonal variations of the ovarian activity, where female camels show only follicular development during the breeding season and only ovulate in response to coitus (Chen and Yuan, 1979; Musa, 1979). Accordingly the short rise followed by decrease in progesterone levels to almost zero, observed in this study, may be attributed to successive maturation and regression of the ovarian follicles, since these females were completely isolated from the male animal. Again the progesterone profile of three animals showed decreased values in samples taken in September (200 µg/kg body weight) when compared to the control group which was sampled in March; only one animal (no.S) showed increased progesterone level which exceeded that of the control. Such decline in the progesterone level may again be explained by the seasonal ovarian activity where there is a remarkable difference between these two groups. The origin of the early short period in progesterone rise is not clearly known and may be considered to be either of ovarian or adrenal origin (Wagner *et al.*, 1969; Bulman and Lamming, 1978). These authors suggested that the short rise in progesterone is necessary for the manifestation of oestrus cycle and sexual receptivity.

Our results were partially supported by the findings of Shaddad (1997) but because of inconsistency of progesterone secretion among the animals under study, seasonal variation of their ovarian activity, lack of information on the reproductive pattern of camels and, that, the hormone level did not exceed the positive level, hence ovulation could occur, we suggest that further studies are needed to

clarify the relationship between ivermectin and the reproductive hormones profile,

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