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Research Article

Progesterone profile in postpartum lactating Ongole (Zebu) cows*

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ABSTRACT

Serum progesterone (P_4) concentrations were estimated and correlated with postpartum ovarian activity in 6 lactating Ongole cows. The P_4 concentration showed a gradual increase from an initial low of 0.33 to 1.13ng/ml to 1.13 to 1.85ng/ml on day 25, and thereafter the concentration was associated with ovarian activity in cyclic cows (1.05 to 0.75ng//ml). In an acyclic cow continuously low progesterone levels were observed. During standing estrus P_4 levels varied significantly (P>0.05) with an increase up to day 17 of the cycle.

Key words: Progesterone, Ongole, Postpartum, Estrus.

INTRODUCTION

Progesterone profiles are capable of providing an objective description of the estrous cycles as well as revealing disturbances. P_4 concentration was lower (0.1 ng /ml) during postpartum samples (Humphrey *et al.*, 1983). The mean levels of serum P_4 were found to be ranging from 0.23 to 5.92 ng/ml in a normal fertile cow (Pargaonkar *et al.*, 1989). Dimmick *et al.* (1991) reported an increase in P_4 concentration preceeded by a reduced follicle diameter. In Nellore (Ongole in India) cows, P_4 concentration in blood increased steadily from second day post ovulation and reached maximum by day 16 (Figueiredo *et al.*, 1997). Similar findings were also observed by Agarwal *et al.*, 1977 in Mariana (Zebu) cows.

MATERIALS AND METHODS

Blood samples were collected in six cows from the day of calving to day 60 at 5 days interval and in eight cows during first postpartum estrous cycle (on day 0, 5, 10, 17 and 25 after AI) with palpation per-rectum for ovarian activity. The blood was collected and allowed to clot for 30-60 minutes at 15 to 20°C and serum was separated by centrifuging the clotted blood at 3000 rpm for 15 minutes (Barros *et al* 2000) and stored at -20°C in plastic bullets, till assay. The serum P_4 concentration was estimated using ELISA technique using progesterone kits (Microwell TM, progesterone EIA, Lot No. 104296 A) Syntron Bioresearch Inc. The sensitivity of the test was 0.1 ng/ml. Intra and inter assay coefficient of variation were 7.3 and 7.5 % respectively. The results were presented by calculating the average absorbance value for each reference-standard, control and sample. A standard curve was plotted with the known absorbance versus corresponding concentration of the standards on linear log-graph paper. The sample P_4 concentration was determined from the standard curve using the percent absorbance of samples to be known. These results were correlated for the ovarian activity observed per-rectum. The data are expressed as mean + SE and statistical significance between days of postpartum were presented.

RESULTS AND DISCUSSION

In the present investigation, the progesterone levels during postpartum and standing estrus in lactating Ongole cows were presented in table 1 & 2. All the cows showed low levels of progesterone on the day of

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* This article is based on the Ph.D. work done by the first author on "Hormonal induction of estrus and ovulation in postpartum lactating Ongole cows".

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calving (0.33 ng /ml). There was a steady increase to 1.85ng/ml up to day 25, which could be due to silent ovulations during the post partum period (Morrow *et al.*, 1966; Rajamahendran *et al.*, 1990). After this initial increase, all the cows under study showed decrease in P_4 to 0.65 & 0.75 ng/ml on days 40 & 45 respectively, at which estrus was observed with a palpable follicle on the ovaries. The progesterone concentration was significantly different ($P<0.05$) between days. During first postpartum estrous cycle, the mean serum P_4 levels on the day of estrus, day 10, day 17 and 25 (after AI) was 0.55 (0.4-0.8), 1.91(1.0-2.4), 2.13+0.29(1.0-3.4) and 2.25 (0.7-4.2) ng/ml respectively. The P_4 concentration was significantly increased from day 0 to 17 both in fertile and non-fertile cows. The serum concentration of P4 observed in this study is closer to the findings of Figueiredo *et al,* 1997 in Nelore cows and lower than the findings of Ruiz - cortes (1999) who reported the minimum and maximum as 1 and 13.8 ng/ml in Zebu cows. The significant increase in serum P_4 concentration during estrous cycle from the day of estrus to day 17 (0.4 - 4.2 ng /ml) was due to Corpus luteum formation (Hansel *et al,* 1973), which could be palpable from day 10 to 15 during the cycle.

In conclusion these observations suggest that the P_4 concentration was low on the day of calving followed by a steady increase up to day 25 with a steady decline to >1 ng/ml at which the cows showed standing estrus around day 40-45 postpartum

Table 1: Serum progesterone concentration (ng/ml) during postpartum in lactating Ongole cows (n=6)

Post partum day	P_4 concentration (Mean +SE ng/ml)	P_4 range (ng/ml)
On the day of calving	0.33 ± 0.04^{C}	0.2-0.4
05	0.40 ± 0.05^{C}	0.2-0.6
10	$0.65 + 0.22^{ab}$	0.4-1.6
15	1.13 ± 0.25^{ab}	0.7-2.2
20	$1.58 + 0.32^{3}$	0.5-2.5
25	$1.85 + 0.52^{3}$	0.6-4.0
30	$1.40 + 0.25^{3}$	0.6-2.2
35	$0.82 + 0.04^{3}$	0.7-1.0
40	$0.65 + 0.16^{3}$	0.4-1.1
45	$0.75 + 0.05^{3}$	0.7-0.8

Means with different superscripts (a, b &c) differ significantly ($P<0.05$)

Table 2: Progesterone concentration (ng/ml) during first postpartum estrous cycle in lactating Ongole cows (n=8)

Days	P_4 concentration (Mean +SE ng/ml)	P_4 range (ng/ml)
Estrus	$0.55 + 0.05^{C}$	0.4-0.8
10	$1.91 + 0.16^{b}$	1.0-2.4
17	$2.13 + 0.29^{C}$	1.0-3.4
25 (after AI)	$2.25 + 0.52^{d}$	0.7-4.2

Means with different superscripts (a, b &c) differ significantly ($P<0.05$)

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