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SHORT COMMUNICATION

Induction and synchronization of estrus in Jersey cows treated with $PGF_2\alpha$ by two different routes

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ABSTRACT

The results of present study suggested the superiority of i.m. treatment of PG as compared to ivsm treatment for induction of luteolysis in cows.

Key words : Synchronization of estrus, $PGF_2\alpha$, ivsm route, progesterone

It is believed that intra vulvo sub-mucosal (i.v.s.m.) administered $PGF_2\alpha$ (PG) is immediately transferred to the ovarian artery via the counter current exchange mechanism operating between the uterine vein and ovarian artery resulting into luteolysis (Hafez, 1987; Gordan, 1996). Considering economics of hormonal treatment in augmenting reproductive efficiency in farm animals, an attempt was made to induce estrus in cows using PG by i.v.s.m. route at 20% of the dose used for i.m. route.

Twenty seven, 40 and 10 cows were treated with single i.m. (0.75 mg Tiaprost 5 ml, Iliren, Hoechst); double i.m. (0.75 mg, twice at 11 days apart) and i.v.s.m. (0.15 mg) dose of PG. Clinical examination and monitoring of signs of estrus were followed regularly, to find out the time taken for onset of estrus. Blood samples collected before and after PG treatment in each group were analysed for Progesterone (P) and estradiol-17β (E) by standard RIA techniques as per the methods of Kubasic *et al.* (1984) and Robertson *et al.* (1979), respectively.

The data on behavioural response of induction of estrus in three groups viz., single i.m., double i.m. and i.v.s.m. administration of PG is presented in Table 1. The estrus was induced in 77.78% (21/27), 70% (28/40) and 50% (5/10) animals respectively, within 57.71±4.42, 70.20±3.83 and 68.00±5.54 h, respectively. Interval to onset of estrus after PG injection in cattle is known to be influenced by age, breed, season and stage of estrous cycle of animals (Stevenson *et al.*, 1984 and Greeves *et al.*, 1985). The results of the present study are in agreement with the earlier report of Agrawal and Umashankar (1997). Different authors (Chatterjee *et al.*, 1989; Pawshe *et al.*, 1991; Krishna Kishore and Subramaniam, 1999) have concluded that about 20% dose of PG is sufficient to induce estrus by i.v.s.m. route.

The levels of ovarian steroids in the blood of Jersey cows treated with PG by two different routes are presented in Table 2. A fall in P levels from 2.73±0.57 to 0.58±0.14 ng/ml in i.m. treated group and 6.08±2.14 to 1.30±0.42 ng/ml in i.v.s.m.

Table 1. Biological response of Jersey cows to synchronization of estrus with $PGF_2\alpha$ by two different routes of administration

Routes	Attempted (n)	Responded (n)	Response (%)	Time interval (h.)
I.M. (single injection)	27	21	77.78	57.71±4.42
I.M. (11 days apart)	40	28	70.00	70.20±3.83
I.V.S.M.	10	5	50.00	68.00±5.54

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Table 2. Progesterone (P) (ng/ml) and Estradiol-17β (E) (pg/ml) levels in Jersey cows treated with $PGF_2\alpha$ by two different routes

Routes	Hormones Analysed	Before treatment	After treatment	
			Responded	Non-Responded
i.m.	P	2.73±0.57 (6)	0.58±0.14 (6)	–
	E	11.21±3.63 (6)	43.08±16.56 (6)	–
i.v.s.m.	P	6.08±2.14 (10)	1.30±0.42 (5)	3.12±0.96 (5)
	E	13.81±3.18 (10)	42.40±9.14 (5)	19.36±4.80 (5)

Number in parenthesis indicates the number of observations

treated group and concurrent elevation in E levels is an indication of complete luteolysis and the beginning of folliculogenesis in cows. Prakash *et al.* (1995) also found similar changes in the P and E levels in Cloprostenol treated induction of estrus in cows.

The results of this study suggests the superiority of i.m. treatment of PG as compared to ivsm treatment. However, further studies on large number of animals would be needed to confirm these observations.

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