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MANAGEMENT OF OESTROUS CYCLE IN CROSSBRED COWS USING PROSTAGLANDIN*

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Considerable attention has been paid in recent times using prostaglandin in the management of oestrous cycle in cows. Trials carried out with different dose regimens and different routes with insemination at detected oestrus and at fixed time after administration of prostaglandin revealed varying results. The present work was undertaken to evaluate the efficacy of administration of prostaglandin F_2 alpha by single or double injection regimen in the management of oestrous cycle in crossbred cows and fertility of fixed time insemination at induced oestrus.

Materials and methods

Materials for the present study consisted of 48 crossbred cows maintained under identical conditions of feeding and management at Kerala Agricultural University Livestock Farms, which did not exhibit oestrus beyond 45 d postpartum. They were subjected to detailed clinico-gynaecological examination and those found to be cycling were selected and randomly allotted to the following three treatment groups.

Group I Sixteen animals were subjected to intramuscular administration of 25 mg of PGF_2 (*** Lutalyse 5 ml) when they had a functional corpus luteum as determined by rectal palpation. Among them eight were inseminated at 72 h and the remaining at 96 h after the administration of Lutalyse.

Group II Sixteen cycling cows with apparently normal reproductive health were administered intramuscularly two injections of Lutalyse, 25 mg each 13 d apart. Among them eight were inseminated at 72 h and the remaining at 96 h after the administration of the second dose of Lutalyse.

Group III Sixteen cows were watched for natural oestrus and inseminated (control).

Observations in respect of oestrus response and time taken from the administration of PGF_2 alpha to the onset of oestrus in groups I and II and duration of oestrus, intensity of oestrus, conception rate and number of inseminations per conception in all the groups were studied and analysed.

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*** Lutalyse (1Inj.) : 5 ml. (UpJohn)
Each ml. contains Dinoprost Tromethamine equivalent to Dinoprost 5 mg.

Table 1 Effect of PGF2 alpha in the induction of oestrus in crossbred cows

		Groups		
		I	II	III
1.	No. of animals treated	16	16	-
2.	No. of animals evinced oestrus	16	16	-
3.	Time taken for induction of oestrus (h)	63.38	67.50	-
4.	Duration of oestrus (h)	29.25	33.00	21.38
5.	Intensityof oestrus (%)			
	a. High	50	12	25
	b. Medium	31	69	50
	c. Low	19	19	25
6.	First insemination conception rate (%)			
	AI at 72 h	25.00	25.00	-
	AI at 96 h	37.50	12.50	18.75
7.	Overall conception rate (%)			
	AI at 72 h	62.50	37.50	56.25
	AI at 96 h	62.50	12.50	-
8.	No. of AI per conception			
	AI at 72 h	2.00	2.67	-
	AI at 96 h	1.60	1.00	3.33

Results and discussion

Perusal of data in table 1 revealed that all the cows treated with PGF_2 alpha evinced oestrus indicating that single as well as double injection schedule of PGF_2 alpha were effective in inducing oestrus in crossbred cows as reported by Nair and Madhavan (1984) and Jacob (1993). Parity of cows and season of the year did not influence oestrus response. However, a marginal decrease in oestrus response was noticed during summer probably due to high ambient temperature which affected the normal hormonal profile of crossbred cows in tropical region. The time taken for induction of oestrus in groups I and II was 63.38 h and 67.50 h respectively. Similar observations were made by Pant *et al.* (1992) and Jacob (1993). Slight variations in the time taken for the induction of oestrus in different studies could be due to variation in the stage of corpora lutea at the time of administration of prostaglandin. It was found that time taken for induction of oestrus was longer in cows which calved once than in those calved twice or more and least during rainy season and maximum during winter. This could be attributed to the better response of uniparous animals to prostaglandin and during the favourable months of the year.

The duration of oestrus in cows ranged from 18 to 48 h (mean 29.25 h), 24 to 48 h (mean 33.00 h) and 12 to 36 h (mean 21.38 h) in groups I, II and III respectively. Analysis revealed significant variation in the duration of oestrus among cows between experimental and control groups. It could also be seen that the duration of oestrus was not different among cows between groups. Duration of oestrus in

experimental cows was longer than that in control indicating longer duration in prostaglandin induced oestrus than natural oestrus in crossbred cows. Jacob (1993) also reported similarly, but this is in contrast to earlier reports of Nair and Madhavan (1994) that duration of oestrus induced by PGF_2 alpha did not show marked variation from normal oestrus in crossbred cows. In the present study all the experimental cows were in early lactation and the variation in the duration of oestrus between natural and induced oestrus might be attributed to this as reported by MacMillan (1993) and Fortin *et al.* (1988). Parity did not influence the duration of oestrus in experimental animals. In the induced oestrus significant variation in the duration of oestrus was observed between winter and rainy season, the duration of induced oestrus was significantly longer, during winter.

All experimental animals which responded to PGF_2 alpha showed marginal increase in vulval oedema, hyperaemia of vaginal mucosa, oestrual discharge and tonicity of uterine horns compared to control animals. The present study revealed that luteolysis and subsequent changes in the reproductive tract brought about by exogenous PGF_2 alpha are similar or even better than that caused by endogenous PGF_2 alpha. Majority of experimental animals in both the groups showed medium to high intensity of oestrus compared to natural oestrus. It was also noted that the percentage of weak oestrus was more in natural oestrus compared to induced oestrus indicating beneficial effect of PGF_2 alpha in the detection of oestrus by better and pronounced oestrus signs.

Perusal of data also revealed that in the case of cows in group I, the first insemination conception rate and overall conception rate were 25.00 and 62.50 per cent when inseminated 72 h post-treatment, while the respective values were 37.50 and 62.50 per cent when inseminated 96 h post-treatment. Eventhough a marginal increase in the first insemination conception rate was observed in cows inseminated 96 h post-treatment, no difference was observed in the overall conception rate. Delayed onset and longer duration of induced oestrus in cows might be attributed to better first insemination conception rate when inseminated 96 h after treatment. When cows in group II were inseminated 72 h after the administration of the second dose of PGF_2 alpha, 25 per cent of animals conceived at first insemination, while the overall conception rate was 37.50 per cent as against 12.5 per cent each in cows inseminated 96 h post-treatment. Thus it could be seen that when double dose regimen was practised a marginal increase in first insemination conception rate was observed when inseminated 72 h post-treatment. The first insemination conception rate of control cows was 18.75 per cent as against 25 per cent in experimental cows. The number of inseminations required per conception was 2.00 and 1.60 and 2.67 and 1.00 at 72 h and 96 h inseminations in groups I and II respectively as against 3.33 in control cows.

Summary

Trials carried out to study the efficacy of prostaglandin in the management of oestrous cycle in crossbred cows revealed that PGF_2 alpha could be successfully used for induction of oestrus in crossbred cows with fixed time insemination. However, comparative studies on fertility in relation to insemination at detected oestrus and at fixed time after administration of PGF_2 alpha are warranted.

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