

FERTILITY FOLLOWING OESTRUS INDUCTION USING PGF_{2α} AND TREATMENT WITH GnRH AND hCG IN REPEAT BREEDING CATTLE SHOWING PROLONGED OESTRUS*

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Repeat breeding is a major impeding factor for achieving the goal of one calf every year in dairy cows. Absent or insufficient or asynchronous preovulatory surge of gonadotrophins might produce a variety of functional disorders leading to infertility. The concept of delayed ovulation implies asynchrony in the time relationship between a Luteinising Hormone (LH) surge and ovulation or insufficient LH surge to stimulate the series of events that culminate in ovulation (Lee *et al.*, 1983). It is suspected that these deviations cause changes in the microenvironment of the preovulatory follicle and thereby affecting its final maturation leading to delayed ovulation and prolongation of oestrus (Bage *et al.*, 2002).

Materials and Methods

The present investigation was carried out in 40 repeat breeding cattle showing oestral symptoms longer than 30 h. They were screened as negative for sub clinical endometritis using white side test. The animals were randomly divided into four groups of 10 animals each. Oestrus induction was carried out in group I, II and III animals using 25 mg dinoprost (Lutalyse®), a prostaglandin analogue on the tenth day of cycle after ascertaining the presence of functional corpus luteum. Group I animals were treated with PGF_{2α} (dinoprost) alone,

group II and III were administered with gonadotrophin releasing hormone (GnRH) and human chorionic gonadotrophin (hCG) respectively 48 h after PGF_{2α} administration.

All the animals in group I, II and III were subjected to artificial insemination twice at an interval of 24 h after detection of proper signs of oestrus. Group IV animals served as control and were inseminated twice at 24 h interval after the onset of natural oestrus without any treatment. Oestrus response following induction was studied in detail. Conception rate in all the four groups were confirmed by per rectal examination on 45-60 days after insemination and over all conception rate for three consecutive oestrus in each group was calculated.

Results and Discussion

The results obtained in the present study are presented in table. All the animals in Group I, II and III responded to PGF_{2α} treatment and hence the efficacy was 100 per cent. The time taken for induction of oestrus in Group I, II and III animals were 52.7 ± 2.99 h, 51.7 ± 2.68 and 52.0 ± 2.68 h respectively. The time taken for induction of oestrus in the present study was comparatively lower than the time taken for induction of oestrus reported by Goley and Kadu (1995) and Selvaraju *et al.* (2004) in repeat breeding cows. The mean

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duration of induced oestrus in group I, II and III were 68.6 ± 3.75 h, 38.6 ± 3.75 h and 37.4 ± 3.75 h respectively. Analysis of data revealed significant difference in the duration of oestrus between group I and the other two groups (II and III). A lower duration of oestrus was reported by Senthilkumar and Rajasekhar (1998) and Velayudakumar (2003) after administration of GnRH and hCG in repeat breeding cattle. The reduced duration of oestrus in group II and III animals would be due to follicular maturation and ovulation at an early period. The physical changes in the reproductive tract of repeat breeders with prolonged oestrus were found to be less pronounced during induced oestrus. However, Jacob *et al.* (1995) reported that the cyclical changes in the reproductive tract were not affected by induction of oestrus with PGF_{2α}.

The conception rate during induced oestrus in group I, II, III and control group were 50, 40, 40, and 30 per cent respectively. Overall conception rate for three consecutive oestrus in group I, II, III and control group were 60, 60, 50 and 40 percent, respectively. The conception rate was maximum in group I prostaglandin alone treated repeat breeding animals compared to all other groups.

Improved conception rate in prostaglandin induced oestrus in cows was reported by Plunkett *et al.* (1984) and Leeba (2003). In group II and III in which GnRH and hCG was administered during induced oestrus, a lower conception rate was obtained as compared to group I repeat breeding animals. Iyer and Sreekumaran (1992) and Velayudakumar (2003) obtained a higher conception rate when GnRH was administered to repeat breeding cattle having ovulatory disturbances. Similarly, higher conception rate in hCG treated repeat breeding cattle was reported by Mehta *et al.* (1986), Goley and Kadu (1995) and Selvaraju *et al.* (2004). However, Archbald *et al.* (1993) reported that treatment with GnRH at or prior to insemination did not improve the conception rate in repeat breeding dairy cows. Similarly, Swanson and Young (1990) observed that hCG administration at the time of insemination failed to improve conception rate. Mialot *et al.* (1999) recommended AI at the observed oestrus in PGF_{2α} induced animals when the oestrus detection was conducted most satisfactorily. However, herds in which oestrus detection was poor, they recommended the sequence of GnRH plus PGF_{2α} protocol and fixed time AI.

Table. Oestrus characteristics and conception rate after using PGF_{2α} and treatment with GnRH and hCG in repeat breeding animals showing prolonged oestrus

	Group I	Group II	Group III	Group IV
Number of cattle treated	10	10	10	10
Number of cattle responded to PGF _{2α} treatment	10 (100%)	10 (100%)	10 (100%)	-
Time taken for induction of oestrus (Mean \pm SE hours)	52.7 ± 2.99	51.7 ± 2.68	52.0 ± 2.68	-
Duration of oestrus (Mean \pm SE hours)	68.6 ± 3.75	38.6 ± 3.75	37.4 ± 3.75	-
Conception rate for first insemination	50%	40%	40%	30%
Overall conception rate after three oestrus	60%	60%	50%	40%

Summary

The trial was conducted to evaluate the fertility of repeat breeding cattle showing prolonged oestrus after induction using dinoprost and further treatment with GnRH and hCG. Results revealed that prostaglandin alone was highly effective with a reasonable

conception rate. Administration of GnRH and hCG during induced oestrus was not beneficial in improving the conception rate. It can be recommended that induction of oestrus using prostaglandin could be employed for enhancing the conception rate in repeat breeding animals with the history of prolonged oestrus.

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