MANAGEMENT OF ANESTRUS AND SUBESTRUS COWS USING HORMONAL AND NON-HORMONAL DRUGS*

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ABSTRACT

A total of 57 anestrus/subestrus crossbred cows were divided in to three treatment groups, each of 13, 13 and 23 cows, keeping 8 cows as untreated control. Thirteen true anestrus cows were treated with nutritional supplements for 15 days and another 13 with single dose of GnRH 20 µg i/m, while 23 subestrus cows were treated with single dose of $PGF_{2\alpha}$ 500 µg i/m. Animals detected in estrus were inseminated artificially. The estrus induction response for the 3 groups was 76.92, 84.62 and 91.30 %, with the mean interval of 26.70±4.52, 28.27±6.46 and 3.52±0.46 days ($P<0.01$), respectively. The estrus response (50 %) and estrus interval (48.25±10.80 days) of untreated control group were significantly ($P<0.05$) lower as compared to all treatment groups. Of the responded cows, 70.00, 72.73 and 71.43 % conceived within 3 cycles as against 50 % conception in control group. The conception rates at induced estrus in 3 groups were 40.00, 18.18 and 52.38 %, respectively.

Key Words: Anestrus, Cows, Hormonal/Non-hormonal therapy, Estrus induction, Conception.

INTRODUCTION

Information on comparative efficacy of hormonal and non-hormonal therapy of anestrus and subestrus in crossbred cows is meagre. Hence, the present study was undertaken to evaluate the response of anestrus/ subestrus crossbred cows under field conditions to nutritional supplements, GnRH and $PGF_{2\alpha}$.

MATERIALS AND METHODS

This study was conducted from August 2007 to March 2008 at two villages of Anand district in Gujarat. Out of 57 crossbred cows confirmed to be anestrus/ subestrus through per rectal palpation twice at 10 days interval, 49 cows were selected at random for following three therapeutic protocols, keeping 8 cows as untreated control. All infertile animals (n=57) were dewormed using Albandazole 3000 mg (Helmiguard 3000, Vetcare India Ltd) and the owners were supplied with 1 kg mineral mixture (Amul brand) for supplementing to their animals @ 30 g/d for 1 month.

Thirteen apparently healthy true anestrus cows were subjected to Tono-Prepaline-Cyclomin plus Lugol's iodine (TPCL) treatment, which consisted of Lugol's iodine 0.25% solution 10 ml on os cervix or i/ut once, plus 4 injections each of Inj. Protone 10 ml i/m (0.2 gram sodium salt of phosphoric acid/ml, Vetnex-RFCL Ltd.) and Inj. Vitamin-A (6 ml i/m; each 2 ml contain 6 lacs I.U. of Vitamin-A as palmitate, Virbac Co.) at 4-5 days intervals and Cyclomin-7 (minerals, 10 boli, Alved Pharma)@ one bolus every third day orally.

Thirteen true anestrus cows were treated with single dose of 20 µg GnRH, i.e Inj. Receptal (Buserelin acetate 0.0042 mg/ml, Intervet India Pvt. Ltd.) 5.0 ml intramuscularly.

Twenty three cows, with history of subestrum and presence of CL on any one of the ovaries, were administered with single dose of 500 µg $PGF_{2\alpha}$, i.e. Inj. Juramate (250 µg Cloprostenol/ml, Jurox Pvt. Ltd., Australia) 2.0 ml intramuscularly.

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Eight apparently healthy anestrus cows were kept as control, without any treatment, but were analyzed for their reproductive status at the end of experiment.

The animals detected in estrus were inseminated at induced or natural estrus. All the animals were followed for at least 3 months post-treatment or for two natural cycles after induced estrus. Estrus induction response and conception rates overall and at induced estrus were calculated and compared by using chi-square test. The data on estrus induction intervals were analyzed by using completely randomized design and Duncan's NMRT (Snedecor and Cochran, 1986).

RESULTS AND DISCUSSION

Out of 13 true anestrus crossbred cows treated with TPCL, 10 (76.92 %) showed estrus induction response within 26.70 ± 4.52 days. Conception rate at induced estrus was higher (40 %) than at subsequent 2 cycles (20 and 10 %) with an overall of 70.00 % and treatment to fertile estrus interval of 39.71 ± 9.21 days among the estrus respondents. These results agreed with the reports of Sharma (2004) and Mathur *et al.*, (2005). Markandeya *et al.* (2002), however, reported comparable estrus response (75 %) with 100 % conception.

Intrauterine infusion of Lugol's solution causes hyperaemia of uterine mucosa, a sign of enhanced circulation, which consequently leads to high degree of drug absorption. The absorbed iodine probably stimulates production of thyroid hormones, which increased body's metabolism rate triggering ovarian function (Sanchez, 1995). The enhanced uterine blood circulation might also influence ovarian activity. Utero-ovarian massage and Lugol's iodine painting of os-cervix was reported to induce estrus in 50 % animals within 8-15 days with 66.67 % conception (Rathour *et al.*, 2005). In the present study, deworming of all animals was done prior to initiation of treatment protocol. The TPCL therapy was found to be significantly beneficial as compared to untreated control group. Thus, the findings suggested that specific vitamin-mineral supplementation should be the part of treatment schedule of anestrus cows.

Among 13 true anestrus cows treated with GnRH, estrus was induced in 11 animals (84.62 %) with a mean interval of 28.27 ± 6.46 days. Conception rate at induced estrus was 18.18 %. While at subsequent I and II cycle, it was 36.36 and 18.18 %, respectively, giving overall conception rate of 72.73 %, and treatment to fertile estrus interval 78.00 ± 13.00 days. The overall results with GnRH were significantly superior when compared with the untreated control group and corroborated with the reports of Nautiyal *et al.*, (1997) and Sonawane *et al.*, (1995), while Shams *et al.*, (1991) and Sirmour *et al.*, (2006) reported higher estrus induction response (100 and 83.33 %), but with lower conception rate (57.14 and 40.00 %, resp.). Zaghloul *et al.*, (1993) recorded only 50-60 % estrus response within 25-30 days of GnRH treatment, but with 100 % fertility in postpartum acyclic cows. The present results clearly indicated that ovarian cyclicity with ovulatory estrus can be effectively induced in a month or so with GnRH in apparently healthy anestrus cows.

Among 23 subestrus cows treated with $PGF_{2\alpha}$, 21 (91.30 %) exhibited estrus within a mean interval of 3.52 ± 0.46 days and 52.38 % conceived at induced estrus. The overall conception rate was 71.43 %. Moreover, the results with prostaglandin therapy were significantly superior over the control group and the other two treatments. These findings compared with the observations of Nair and Madhavan (1984) and Deshpande *et al.*, (2007). Sheshappa *et al.*, (2002) obtained 83.33 % conception in GnRH treated postpartum cows as compared to 33.33 % in untreated cows. The luteolytic action of $PGF_{2\alpha}$ (25 to 30 mg) or its analogues is most potent between days 5 and 17 of the bovine cycle and most of the animals show ovulatory estrus within 3-4 days of treatment (Rowson *et al.*, 1972). In the present study, double the first service conception rate in $PGF_{2\alpha}$ treated cows as compared to control group (52.38 vs 25.00 %) clearly supported that $PGF_{2\alpha}$ analogues have definite standing in management of subestrus condition in cows. However, the variations observed in estrus induction response and fertility in different studies could be due to the stage of cycle, product potency, estrus detection efficiency, nutritional status, general and genital health, breeding time and quality of semen used, season/climate, and luteal activity or sustainability leading to embryo survival and such other factors.

Among the total 49 hormonally and non-hormonally treated anestrus/subestrus crossbred cows, 85.71 % exhibited induced estrus with a mean estrus induction interval of 15.55 ± 2.71 days. The conception rate at induced estrus was higher (40.48 %) than at subsequent cycles (18.37 and 8.16 %). The overall conception rate was 71.43 %, and treatment to fertile estrus interval of 37.07 ± 6.91 days. For the eight anestrus crossbred cows kept as untreated control, natural estrus was exhibited by 4 (50 %) cows at a mean interval of 48.25

± 10.80 days, and only two (50 %) conceived with a mean fertile estrus interval of 38.50 ± 1.05 days. Thus, the estrus induction response and conception rate were significantly better for the treated animals as compared to control ones

The present relative findings with $PGF_{2\alpha}$ and GnRH therapy are far better than the results of Patel *et al.*, (2007), who recorded 33.3 and 50.0 % estrus induction response with 50.0 and 66.6 % conception rate in anoestrus buffaloes treated with $PGF_{2\alpha}$ and GnRH, respectively, as against 16.6 and zero % conception in untreated control groups. From the present results, it can be concluded that suitable non-hormonal and hormonal drugs can be used effectively for the treatment of anestus and subestrus condition in crossbred cows.

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