

Efficacy comparison between Cloprostenol and GnRH analogue on anestrus cows- a field study

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Abstract

The present study was conducted on 20 postpartum anestrus cows to evaluate Therapeutic efficacy of Synthatic prostaglandin cloprostenol (Vetmate™) and GnRH (Receptal™) in terms of oestrus induction efficacy, oestrus induction interval and conception rate. Since, the study was carried out at field level around Mhow region cow having CL on palpation and smooth ovaries (status of the estrous cycle was evaluated by rectal palpation) were selected and divided into two groups: Group I.(GI,n=10) Cows having Corpus luteum Treated with an injection of PGF2α analog Cloprostenol (Vetmate 2ml i/m) and fixed time insemination (FTAI) was done 72 h post Cloprostenol (Vetmate) injection.and the Group II(GII,n=10) animals having smooth ovaries were treated with Gnadotropin (GnRH; 100µg). In response to the treatment induction of estrus in higher number of animals using cloprostenol (VETMATE) (G-1, 90%) as compared to GnRH (G2, 50.00%) , and the mean post treatment estrus induction interval were shorter in Group I (2.37 ± 1.33 days) in comparison GnRH treated group-II (10.16 ± 0.33 days). In manner of conception rate among the induced estrus animals it was observed that

78 percent cows conceived in Cloprostenol (Vetmate) treatment group while 80 percent cows got conceived in GnRH treated group.

Key words postpartum, anoestrus, oestrus induction, conception rate.

Introduction

Anestrus in cattle is the principal symptom of many conditions that affect the estrous cycle. It is the commonest single cause for infertility in cattle (Roberts, 1998). The resumption of estrus cycle after parturition in cows is delayed for a variable period. The influences include genetic, environment, nutritional status, milk yield, parity, breed, calving difficulties, postpartum diseases, ovarian disorders and inadequate amount of gonadotrophins (Hukeri, 1995). Variable observations pertaining to postpartum anestrus were also reported viz. 25.7 per cent (Sreemanarayana and Rao, 1997) and 31 per cent (Kutty and Ramachandran, 2003) in crossbred cows. To improve reproduction efficiency by reducing the length of breeding and calving interval, more efficiently use of Artificial insemination technique,regular cyclicity is the stepping-stone in reproductive life of any dairy animal. To attain this

objective, the dairy industry needs to address the problem of declining reproductive efficiency today, as the economic implications of it is very high and cumulative Postpartum anoestrus is one of the biggest hurdles in optimizing reproductive efficiency of high yielding dairy cows (Yamada and Nakao, 2002). To overcome this problem, both hormonal as well as non hormonal treatments have been tried. Hormonal measures mainly include PGF₂α, Oestrogenic, GnRH etc.therapy, while non hormonal treatments include Iodine, ayurvedic heat inducer capsules, tablets and broad spectrum antibiotics.

Keeping in view the high incidence, economic importance, multiple aetiology, and complexity of the problem, the present study was conducted to evaluate the efficacy of PGF₂α analogue Cloprostenol, (Vetmate) and GnRH analog (Receptal) as the treatment for induction of estrus in anoestrus cows at field level.

Therapeutic management of anoestrus with cloprostenol and GnRH therapy

Nasar *et al.* (1983) injected 20 µg GnRH I/M to 10 anoestrus buffaloes, out of them 7 animals induced in estrus within 3-10 days of treatment with 100% ovulation, of which 5 conceived at induced estrus. The other 2 animals showed sign of estrus but failed to conceive.

The beneficial effect of Gn-RH (100 - 200 µg) for induction of estrus in anoestrus buffalo heifers and cows with a reasonable degree of fertility has been reported by Rao and Venkatramiah (1991).

El Fadaly *et al.* (1994) used 250 µg GnRH in one or two doses with an interval of one week for the induction of estrus in cattle

Santos *et al.* (2000) administered 0.5 mg of cloprostenol intramuscularly to crossbred cows with palpable corpus luteum and found that

87.5 percent cows exhibited estrus within 48-72 hrs with 67.5 percent conception rate.

Material and Method

The present experiment was conducted on 20 healthy, postpartum, non suckling, anoestrus crossbred cows, weighing approx 300-400 kg with the history of normal calving but not resumed estrus to 90 or more days after calving the experiment was conducted around Mhow (Indore) region. The confirmation of anoestrus was made on the basis of history, gynaecological examination of genitalia twice at weekly interval. Animals having smooth ovaries (without palpable corpus luteum and follicle) and cow having functional Corpus Luteum on palpation with normal developed genital tract were selected for the experiment. These cows were further divided in to two groups :

Subgroup A: This group was consisting of 10 postpartum anoestrus cows with palpable corpus luteum. These cows were treated with a Synthetic prostaglandin cloprostenol (VETMATE™) 500 mcg (2ml) intramuscularly once only as single dose.

Subgroup B: This group consisted of 10 postpartum anoestrus cows with inactive smooth ovary. These cows were treated with GnRH analogue Receptal™ (Buserelin acetate) 0.021 mg (5 ml) intramuscularly once only as single dose

REPRODUCTIVE MANAGEMENT AND FERTILITY STATUS

All the animals were observed for signs of estrus by farmer twice daily at morning and evening. The estrus induction rate was determined based on the results of visual observations for estrus signs, in both groups. All the animals were examined per rectally at an interval of 7 days after treatment to monitor the ovarian and uterine changes. Cows were bred by either natural service or AI at induced estrus using a fertile bull or frozen semen and

Ovulatory response was studied by rectal examination and presence of corpus luteum on the surface of ovary at day 10 post estrus . All the animals were examined per rectally at 60 days post service for confirmation of pregnancy. The time taken for onset of estrus following withdrawal of treatment, occurrence of ovulation and fertility at induced estrus were calculated and analyzed.

Results and Discussion

Results pertaining to the efficacy comparison between cloprostenol and GnRH analogue on anestrus cows have been presented in Table. The induction of estrus following administration of cloprostenol in anestrus cows was higher (90.00% G-1) as compared to GnRH treated animals (50.00% G-2); and the mean post treatment estrus induction interval were shorter in Group I (2.37 ± 1.33 days) in comparison GnRH treated group-II (10.16 ± 0.33 days) and In manner of overall conception rate among induced estrous animals it was observed that 80 percent cows conceived in GnRH treatment group while 78 percent cows got conceived in cloprostenol treated group (Table). similar findings are reported by Santos *et al.* (2000) administered 0.5 mg of cloprostenol intramuscularly to crossbred beef cows with palpable corpus luteum and found that 87.5 percent cows exhibited estrus within 48-72 hrs with 67.5 percent conception rate. This compares also favourably with the findings of Ingawale *et al.* (2003) who reported 100 percent oestrus induction response after administration of 25 mg of PGF₂α (Lutalyse).

GnRH and its analoge has been used for induction of estrus and fertility in anestrus bovines by various workers, who have reported 22 to 87% induction of estrus with an average interval of 4 to 29 days, 75 to 100% ovulation

1. El- Fadaly, M. A., A. A. Atiefa , H.R. Abbass and G.S. El- Essaway (1994). Induction of

and 9 to 66.7% of conception rate (Markanadya and Patil, 2003; Sirmour *et al.*, 2006). The results of the present study in respect to the time taken for onset of estrus, ovulation and conception rate at induced estrus was comparable to Rathour (2004) and Ramoun *et al.* (2007). GnRH induces LH surge and ovulation when given to post partum dairy animals (Foster *et al.*, 1980). This would explain the findings of a higher conception rate obtained in the present study.

Table: Estrous induction and fertility response using Synthatic prostaglandin cloprostinol (Vetmate) and GnRH (Receptal) in Cow

S. No.	Attributes	Groups-I (G1) Cloprostenol (Vetmate™)	Groups-II (G2) GnRH (Receptal™)
1.	Animal Treated(n)	10	10
2.	Duration of Treatment (Days))	1	2
3.	Animal Induced in estrus	9/10(90.00%)	5/10 (50%)
5.	On set of estrus interval following start of treatment (days)	2.37 ± 1.33 (1-4 days)	(10.16 ± 0.33) (8-18 days).
6.	Animals Bred	9/9	5/5
7.	Animals conceived at induced estrus	7/9	4/5
8.	Over all conception rate (CR)	78%	80%

References

- cyclicity in anestrus and subestrus post-partum Egyptian buffaloes. 4th World Buffalo Congress, Sao Paulo, Brazil, P27-30.
2. Foster, J. P., G. E. Lamming and A.R. Peters (1980). Short term relationships between plasma LH, FSH and progesteron concentrations in post-partum dairy cows and the effect of GnRH injection. *J. Reprod. Fertil.*, **59**: 321-327.
 3. Hukeri, V. B (1995). *Indian J. Anim. Reprod.*, **16**: 1-4.
 4. Ingawale, M.V., R.L. Dhoble, A.G. Sawale, M.G. Gacehe, M.N. Rangnekar and J.M. Jhadav (2003). Effect of Fertagyl (GnRH) administration at the time of insemination on conception rate in prostaglandin induced oestrus in cows. *The Blue Cross Book*, 20: 8.
 5. Kutty, C. I. and Ramachandran, K. (2003). *Bovine infertility.*, **73**: 155-157.
 6. Markandeya, N.M. and A.D. Patil (2003). Studies on hormonal therapies for induction of post-partum estrus in buffaloes. *Intas Polivet*, 4 (**11**): 167 - 169.
 7. Nasar, M.J., S. M. Shory, M.A. El-Azab and F.M. Labid (1983). Induction of estrus and improvent of fertility in anestrus cows and buffaloes with Receptal. *zychygiene*,**18**:129.
 8. Ramoun, A.A, A.D, Khalid, T. Osman, B. Samy, A. Darwish, B. Aly, M. Karen,A. Magdy, H. Gamal (2007). Effect of pretreatment with insulin on the response of buffaloes with inactive ovaries to gonadotrophin-releasing hormone agonist treatment in summer, *Reproduction, Fertility and Development*, 2007, **19**: 351–355
 9. Rathour, K.K. (2004). Studies on Treatment of Anestrus in Murrah Buffaloes. M.V.Sc.&A.H.Thesis,JNKVV, Jabalpur.M.P.
 10. Roberts, S. J. (1998). *Veterinary Obstetrics and Genital Diseases*. 2nd Edition (Indian reprint) CBS Publishers, New Delhi- 100012, PP. 436.
 11. Santos, I. W., R. R. Weiss and L. E. Kozicki (2000) Estrus synchronization in beef cows. *Arch. Vet. Sci.*, **5**: 1–4.
 12. Sirmour S.K., S.P Nema, B.K. Singh and S.P. Shukla (2006). Induction of oestrus in delayed pubertal cross-bred heifers *Indian Journal of Animal Reproduction.*,**27** (1): 55-58
 13. Sreemannarayana, O. and Rao, A.V.N. (1997). *Indian J. Anim. Reprod.*,**18**: 46-47.
 14. Yamada, K. and T. Nakao, (2002). Some factors affecting conception rate in dairy cows after ovulation, synchronization and fixed time artificial insemination. *In Proc: 22nd World Buiatric Congress*, Hannover. December 2002. pp 300 – 306.