

Evaluation of Pre and Post Artificial Insemination effect of GnRH Hormone on conception of repeat breeder Deoni Cows

Mahesh S. Dodamani*, Khaja Mohteshamuddin, S.D. Awati, M.K. Tandle and S.S. Honnappagol

Department of Animal Reproduction, Gynaecology and Obstetrics, Veterinary College, KVAFS University, Nandinagar, Bidar-585401, Karnataka, India.

* Corresponding author email: maheshdodamani@gmail.com

Abstract

Twenty four Deoni repeat breeder cows were randomly allocated into 4 groups of six each. The animals of groups I, II and III were injected with 250 µg of buserelin acetate (Receptal®) on two occasions i.e. once on day of estrus and second dose on days 10 or 12 or 14 respectively in I, II and III groups following breeding, while the animals of group IV served as control. Among the physical characters of estrual cervico-vaginal mucous, typical arborization pattern (80.95 % in pregnant vs. 55.56 % in non-pregnant cows) and marginally high spinnbarkeit readings (24.67±2.7cms in pregnant and 22.21±1.32 cms in non-pregnant cows) favored better fertility, although the differences between the groups were statistically insignificant. However, the pH of estrual cervico-vaginal mucous did not indicate any effect on fertility and it ranged between 8.00 to 9.00. The cows of treatment groups I, II and III registered a considerably higher conception rate of 83.33 percent each, while in control group cows had only 33.33 percent. To conclude GnRH therapy irrespective of days of administration resulted in an overall enhancement in conception rate of 83.33 as against 33.33 percent in control groups of cows.

Key Words: Repeat breeding, GnRH, Conception Rate, Cervical mucous and Deoni Cows.

Introduction

A successful conception is often a cause for celebration and not taken as a routine affair. Failure of cattle to become pregnant after repeated inseminations often lead to frustration in both farmers and veterinarians. Repeat breeding results in delayed conception and longer calving interval thereby affecting the economy of the dairy industry. Among the various reproductive disorders, repeat breeding syndrome (RBS) alone is said to contribute to the tune of 2.29 to 42.7 per cent (Narayan Rao, 1980 and Bhosrekar, 1973). Therapeutic management of repeat breeders employing GnRH therapy at or near breeding (Ryan et al., 1991), mid luteal phase of cycle following breeding (Macmillan et al., 1986). In view of the above, the present study was designed to ascertain the beneficial effects of combined GnRH therapy at estrus and mid luteal phase following breeding in repeat breeding Deoni crossbred cows.

Materials and Methods

Twenty four crossbred repeat breeder Deoni cows were randomly allocated into 4 groups of 6 cows each. The selected cows were in good body condition and

had experience of calving at least once. All these cows were monitored for one complete estrous cycle before the commencement of the trial. Estrus was detected by visual observation at an interval of 8 hrs associated with gynaeco-clinical examination. Cervico-vaginal mucous was collected and subjected to study pH, spinnbarkeit and arborization pattern.

The cows of group I, II and III were injected with buserelin acetate (Receptal®, M/s Hoechst Roussel vet.Pvt.Ltd Pune.) @ 250 µg buserelin acetate IM on the day of estrus and second dose on day 10, 12 and 14 respectively following breeding in group I, II and III. The animals of control group received placebo injection of normal saline.

Following the detection of estrus the cows were bred with frozen thawed semen twice at an interval of 12 hrs and pregnancy was confirmed 60 days later by per-rectal examination. The data was analyzed as per the method described by Snedecor and Cochran (1967).

Results and Discussion

The cows that subsequently became pregnant exhibited considerably higher percentage (80.95) of

Table-1. Rheological properties of cervico-vaginal mucus (CVM) at estrus and conception Rate (CR) in repeat breeder Deoni Cows

Groups	Arborization of CVM(%)		Spinnbarkeit values(cms)	pH values	Coception Rate(%)	Cost of GnRH therapy per animal
	Typical	Atypical				
I(6)	83.33(5)	16.67(1)	24.50±3.70	8.90± 0.76	83.33(5)	Rs.250
II(6)	66.67(4)	33.33(2)	24.83±3.18	8.91 ±0.25	83.33(5)	Rs.250
III(6)	66.67(4)	33.33(2)	25.16±3.71	8.83±0.25	83.33(5)	Rs.250
IV(6)	83.33(5)	16.67(1)	20.17±2.73	8.91 ±0.25	33.33(2)	----

typical arborisation pattern, while atypical arborisation pattern percentage was 19.05. The cows that failed to conceive had 55.56 typical and 44.44 percent atypical arborisation pattern (Table.1 and 3). These findings are in conformity with the observations made by Choudari (1998) in Deoni cows. On contrary Bennur (1998) did not notice any difference in arborisation pattern of estrual cervico-vaginal mucous in the pregnant and non-pregnant animals.

Phatak et al., (1980) concluded that measurement of spinnbarkeit value of estrual mucus could be valuable tool for detection of ovulatory estrus. The mean spinnbarkeit values of the estrual cervico-vaginal mucus ranged between 10.00 to 42.00 cm (Table.1 and 3). The animals that subsequently became pregnant had non significant marginal higher mean spinnbarkeit value $24.67 + 2.70$ cm as against non-pregnant where, it was $22.21 + 1.32$ cm (Table 1). These observations were in conformity with the earlier reports of Mohanty et al., (1996) where the higher spinnbarkeit values were correlated with the better conception rate in cows. However, Crane et al., (1960) failed to notice any significant difference in the spinnbarkeit value of estrual cervico-vaginal mucus in fertile and infertile cows.

The pH of cervico-vaginal mucus ranged between 8.00 to 9.00 and the cows that subsequently became pregnant had a mean pH of $8.80 + 0.27$ while it was $8.75 + 0.08$ in non-pregnant and the difference was statistically non-significant (Table 1 & 3). Thus, the pH values did not depict any bearing on the fertility conforming earlier reports of Radoslavo (1974). The pH range of 7.00 to 9.00 was found to be satisfactory to maintain the progressive forward movement and viability of spermatozoa (Pattabiraman et al., 1967).

The cows of treatment group I, II and III registered a considerable higher conception rate of 83.33 as against 33.33 % in the control group (Table.1 and 3). Buserelin acetate supplementation at the onset of estrus might have hastened the endogenous release of LH ending up with ovulation thereby increasing the fertility rate (Mee et al., 1990). Similarly, Macmillan et al., (1986) reported improved conception rate following GnRH therapy between days 10 to 14 post breeding. The luteotrophic effect on account of endogenous

release of LH might have provided luteotrophic effect as evident by the fact that GnRH therapy between 11 to 14 days following insemination resulted in acutely elevated serum progesterone levels following and during several days thereafter (Macmillan et al., 1986). Thus, the mid luteal phase GnRH therapy employed in the present study might have enabled the corpus luteum to revert temporarily the luteolytic effect of PGF2 alpha reported by Macmillan et al., (1986). However, several other studies did not reveal any improvement in the fertility with mid luteal phase GnRH therapy i.e. day 11 to 13 following breeding in the normal and repeat breeder cows (Jay Kumar and Vahida, 2000).

The luteotrophic, lute protective and antiluteolytic responses elicited on account exogenous GnRH therapy in midluteal phase might have increased the possibility of maternal recognition of pregnancy prior to initiation of luteolysis which otherwise might have ended up with early embryonic death (Macmillan et al., 1986). The cost component involved in the treatment of repeat breeder is affordable by the dairy farmers (Table.2).

Buserelin acetate therapy on day of estrus and on day 10 to 14 following breeding coupled with double insemination in repeat breeder crossbred cows has resulted in improved conception rate. The cost involved in the treatment is effective and affordable to the farmers.

References

1. Bennur, P.C., (1998): Invitro sperm mucus penetration tests and physical characters of cervico-vaginal mucus in relation to fertility of cows. Thesis submitted to University of Agricultural Sciences, Dharwad.
2. Bhosrekar, M.,(1973): Investigation into the incidence and causes of repeat breeding in dairy cattle at National Dairy Research Institute, Karnal (Haryana), India Veterinary Journal, 50 :418-429.
3. Choudri, S. C., (1998): Estrus synchronization and fertility in Deoni cows using different PGF2a preparations. M.V.Sc, thesis submitted to University of Agricultural Sciences, Dharwad.
4. Crane, J.C. et.al.(1960): The rheology of cervical secretions of cows. *Biological Abstract* 35:62690.
5. Jayakumar C. and Vahida, A. M., (2000): Effects

Table-2. Physical characters of estrul cervico-vaginal mucus of pregnant and non-pregnant repeat breeder Deoni cows.

Groups	Physical characters of cervico-vaginal mucus			
	pH	Spinnbarkeit(cms)	Arborization (%)	
			Typical	Atypical
Pregnant Group (17)	8.80 ±0.27	24.67 ± 2.70	80.95(14)	19.05(3)
Non Pregnant(7)	8.75 ±0.08	22.21 ± 1.32	55.56(4)	44.44(3)

of administration of a gonadotrophin releasing Hormone analogue at mid cycle post insemination. *Indian Vet. Journal*, 77: 454-455.

6. MacMillan, K.L. (1986): Effect of agonist of GnRH in cattle. 1. Hormone concentration and estrous cycle length. *Animal Reproduction Science*, 8: 203.
7. Mee, M.O. et.al.(1990): Influence of gonadotrophin releasing hormone and time of insemination relative to estrus on pregnancy rate of diary cattle at first service. *Journal of Dairy Science*, 73: 1500.
8. Mohanty, L.B. N. et.al.(1996): Physicobiochemical properties of cervical mucus in normal and repeat breeding cows. XIII National convention of ISSAR and national symposium on animal Biotechnology, Dec. 4-6, 1996, G. B. Pant, Univ. of Agri. and Technology, Pantnagar, India.
9. Narayan Rao, V.(1980): Infertility problems in cross bred cows in Andhra Pradesh. ISSAR Second Annual convention and National symposium held at University of Agricultural Sciences, Bangalore, and pp. 191-195.
10. Pathak, A. P., et.al.(1980): Use of cervical mucus pattern, elasticity of mucus and vaginal examination for detection of estrus in dairy cattle. *Proceedings of society of Theriogenology*, 6: 201-203.
11. Pattabiraman, S. R., et.al. (1967): Physio-chemical properties of oestrual mucus of cows. *Indian Veterinary Journal*, 44: 413-417.
12. Radslavo, V. (1974): Relationship of bactericidal activity and pH of vaginal and uterine mucus with conception rate in cows. *Ani. Breeding Abstr.* 43:83.
13. Ryan, D.P. et.al.(1991): Pregnancy rates in dairy cows following the administration of a GnRH analogue at the time of artificial insemination or at mid-cycle post insemination. *Theriogenology*, 36: 367-377.
14. Snedecor, G.N. and Cochran, W.G. (1967): In statistical methods, 6th edition Oxford and IBH publishing co., Calcutta.

* * * * *