Effect of GnRH Analogue, PMSG and Progesterone on Induction of Oestrus in Postpartum Anoestrus Jersey Crossbred Cows (Bos Taurus)

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Abstract

A study was conducted to evaluate the effect of GnRH analogue, PMSG and progesterone on induction of oestrus in postpartum anoestrous cattle bearing inactive ovaries. The animals were divided into four groups viz. group I, II, III and IV. Group I and II were treated with GnRH (Receptal 5ml) and PMSG (Folligon 500IU). Group III animals were treated with Hydroxyprogesterone caproate (proluton depot 500 mg) in two occasions at 7 days interval. Group IV was treated with normal saline. The number of cows came into oestrus were 3/5(60.00%), 2/5(40.00%), 2/5(40.00%) and 1/5(20.00%) in group I, II, III and IV respectively. Onset of oestrus was 20.00±1.15, 10.00±1.00, 4.50±0.50 and 17.00 days. The size of the follicles attained on day of oestrus was 11.54±0.37, 12.70±0.60, 11.11±1.19 and 9.86 mm in group I, II, III and IV respectively. Results indicated that the postpartum anoestrous cow could be brought into oestrus earlier with largest follicular size (12.70±0.60 mm).

Keywords: Postpartum Anoestrus; Cows; GnRh; PMSG; Progesterone; Induction of Oestrus.

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Introduction

Postpartum anoestrus in cattle may be a result of suppression of gonadotropin releasing and/or follicle stimulating hormone release or ovulation of follicles due to effect of improper nutrition, systemic diseases or lactation. Gonadotropic releasing hormone (GnRH) and Pregnant Mare Serum Gonadotropin (PMSG) are gonadotropic hormones which stimulate the follicular growth in the ovaries and useful to induce oestrus in cattle [6]. Response to a particular dose of GnRH and PMSG in treated animal is related to its inherent endocrine status. Hydroxyprogesterone caproate has a significant progesterone effect for 7 to 14 days that cause negative feedback effect on GnRH and gonadotropin secretion and suppress ovulation temporarily. Exogenous progesterone is useful to bring the anoestrous cow into fertile oestrus [7].

This investigation was conducted in postpartum anoestrous Jersey crossbred cow to obtain information about GnRH (Receptal©; Intervet, SPAH); PMSG (Folligon©; Intervet SPAH) and Hydroxyprogesterone caproate (Proluton depot©; Abbot) in respect of a) number of cow came into oestrus, b) number of days required between treatment to induced oestrus and c) maximum size of follicle achieved during oestrus.

Materials and Methods

The investigation was conducted from 15th August, 2011 to 15th December, 2011 during summer and winter season. Twenty postpartum anoestrous crossbred Jersey cows (Bos Taurus) aged between 5 ½ to 7 years, approximately 150 to 200 kg body weight between 3rd to 5th lactation with apparently normal genitalia and sound general health were taken for the study. The selected animals were reared in intensive system and maintained under uniform feeding, housing and managerial condition both at Instructional Livestock Farm, CVSc. and Govt. Livestock Farm at Khanapara, Guwahati-22. The animals were selected based on history of not showing oestrus during 80 postpartum days, followed by two rectal examinations at an interval of 10 days revealing smooth ovaries, flaccid uterine horns and closed cervix.

The animals were divided into four groups (group I, II, III and
IV) comprising of five animals in each group. Group I animals were treated with single injection of Gonadotropin releasing hormone (Receptal®) @ 5 ml through I. M. route. The cows of Group II were treated with 500 I.U. of Pregnant Mare Serum Gonadotropin (Folligon®) through I. M. route. In Group III the anoestrus cows were treated with two injections of Hydroxyprogesterone caproate (Proluton depot®) in 7 days interval @ 500 mg through I. M. route. Group IV animals were treated with 2 ml normal saline through I. M. route and served as control.

The animals in each group were observed at morning and the evening from next day of treatment till onset of oestrus or 21 days, whichever was earlier. Besides behavioural signs the probable genital status during oestrus was also examined per rectal examination to confirm the oestrus. The size of the follicle(s) present in the ovaries on the day of the oestrus was measured transrectally using real-time B-mode ultrasonographic linear probe* (5.0 MHz).

**Discussion**

In the present study, cows responded to GnRH treatment with onset of oestrus was 60.00% (3 of 5). In PMSG treated group it was 40.00% (2 of 5) while 40.00% (2 of 5) was found in Hydroxyprogesterone caproate treated group (Figure 1.). The incidence of induced oestrus was lower than the records (66.00%) reported by Kumar et al. (2000), [4] while it was found to be simulated (50.00 to 60.00%) to the findings reported by Zaghloul et al. (1993). [10] The discrepancy in different studies might be attributed to variation in physical status of treated animals, feeding and management status, climatic condition and potency of GnRH hormone used. The cow responded to PMSG treatment in the present study was lower than that of Shah et al. (1987), Agarwal et al. (2001) and Patel et al. (2003). [1,5,8] This variation could be due to variation in PMSG doses which were used by various workers. Moreover, use of norgestomet as ear implant or injection, use of PGF$_2$α injection preceding injection of PMSG and use of estradiol valerate before PMSG injection in different experiments might also be the reason of variation in results. Incidence of induced oestrus recorded with hydroxyprogesterone caproate treatment was found to be higher than that of Prasad and Singh (2006) [7] and lower than that of Tripathy et al. (2011). [9] The discrepancy in the findings of different studies might be due to doses used, effect of repetition and period of repetition of drugs.

The time of induction of oestrus of treatment was found to be shorter in group II (10.00±1.00 days) than group I (20.00±1.15 days) (Figure 1.). Earlier period of onset of induced oestrus was reported by Prahalad et al. (2010) [6] might be due to dose of PMSG used in inactive ovaries. Besides, variation in body weight and body conditions of the animals might have some effect on variation in induction of oestrus. The onset of induced oestrus in group III was 4.50±0.50 days from the day of second injection. The findings of the present study corroborate to the findings of Prasad and Singh (2006) [7] where double injections of progesterone was reported effective. The variation might be due to physical status of the animal and potency of drugs.

The size of the follicles on the day of oestrus obtained in group I, II and III were 11.54±0.37 mm, 12.70±0.60 mm and 11.11±1.19mm (Figure 1.) which was lower than that (13.40±0.54 mm) of Awasthi et al. (2009) [2] and higher than that (9.17±0.22mm) of Krishnamohan et al. (2009). [3] The variation in findings of different studies might be attributed to physiological status of animals besides effect of different drugs.

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![Figure 1. Percent of oestrus, days of oestrus and size of follicles in different groups of cows](http://scidoc.org/IJVHSR.php)
References

[1]. Agarwal S.K., Shankar U., Kumar S., Mohan G. (2001) Ovarian cyclicity and progesterone profile in postpartum anoestrus cattle using a synthetic progestogen, norgestomet regime. Indian J Anim Sci 71(12): 1120-1123.

[2]. Awasthi A.K., Kavani F.S., Dhami A.J., Panchal M.T. (2009) Postpartum follicular development and its influence on subsequent reproduction in buffaloes. Indian J Anim Reprod 36(2): 57-59.

[3]. Krishnamohan M., Misra O.P., Singh C., Prakash B.S. (2009) Follicular development pattern in postpartum anoestrus Sahiwal cows during Ovsynch protocol. The Indian Vet J 87: 448-450.

[4]. Kumar H., Nair T.S., Chaturvedi V.B. (2000) Efficacy of GnRH analogue for treatment of anoestrus in crossbred cows under temperate farm condition. Indian J Anim Sci 70(9): 931-932.

[5]. Patel D.M., Sarwaiya N.P., Patel A.V., Parmar A.P., Dugwekar Y.G. (2003) Induction of estrus and hormonal profile in buffalo treated with norgestomet ear implant. Indian J Anim Reprod 24(1): 67-68.

[6]. Prahalad P., Rao S.K., Raju K.G.S. (2010) Effect of GnRH, PMSG and Placentrex on reproductive performance of postpartum true anoestrus murrah buffaloes. Indian J Anim Res 44(3): 201-204.

[7]. Prasad R.N., Singh G. (2006) Progesterone treatment of anoestrus cows during summer season. The Indian Vet J 83: 318-319.

[8]. Shah S.N.H., Williams A.H., Van De Wiel D.F.M. (1987) Induction of ovulatory estrus in true anoestrus buffaloes during low breeding season. Anim Reprod Sci 14: 233-238.

[9]. Tripathy A.K., Mohany D.N., Das S., Mishra P.C. (2011) Augmentation of fertility in postpartum anoestrus cows. Indian J Anim Reprod 32(1): 27-30.

[10]. Zaghloul A.H., Daghash H., Meghahed G.A., Shehata S.H. (1993) The use of GnRH for treatment of ovarian inactivity in cows and buffaloes. Assiut Vet Med J 29: 235-240.