

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

Case Report

M. Bharali¹, P.M.Barua^{1*}, B.C. Deka¹, D. Kalita⁴, D.J. Dutta⁵, D. Mili⁶ and K. Ahmed¹

¹Department of Animal Reproduction, Gynaecology & Obstetrics, College of Veterinary Science, Assam Agricultural University, Khanapara, Guwahati- 781 022, Assam, India.

⁴Department of Surgery and Radiology, CVSc, A.A.U., Khanapara, Guwahati-22, India.

⁵Department of Animal Physiology, CVSc., A.A.U., Khanapara, Guwahati- 22, India.

⁶Department of LPM, CVSc., A.A.U., Khanapara, Guwahati-22, India.

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.

*Corresponding Author:

Prithviraj Barua,

Department of Animal Reproduction, Gynaecology & Obstetrics, College of Veterinary Science, Assam Agricultural University, Khanapara, Guwahati- 781 022, Assam, India.

E-mail: prithviraj.barua@gmail.com

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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 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 transectally 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 Zaghoul *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_{2α} 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.

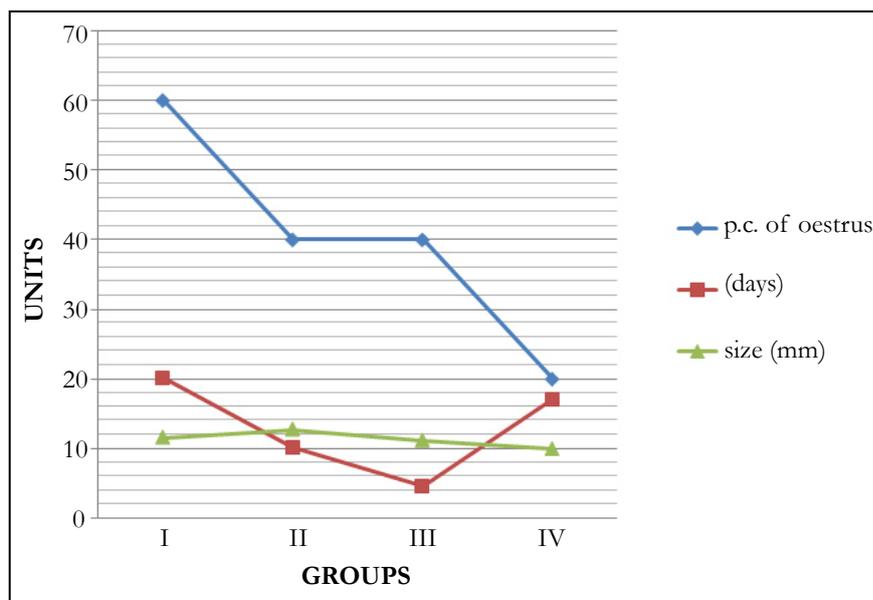
The time of induction of oestrus of treatment was found to be shorter in group II (10.00±1.00 days) than group I (20.00±1.15 days) (Figure 1.). Earlier period of onset of induced oestrus was reported by Prahalad *et al.* (2010) [6] might be due to dose of PMSG used in inactive ovaries. Besides, variation 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



* Real-time B-mode ultrasonographic linear probe : S.S. Medical System India Pvt. Ltd. , F2 and F3 Industrial Area, Bhimtal, Dist. Nainital (Uttarkhand) INDIA

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