ENHANCEMENT OF CONCEPTION RATE BY GNRH WITH TAI IN REPEAT BREEDER COWS UNDER FIELD CONDITIONS

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ABSTRACT

Thirty three repeat breeder dairy cows maintained under field conditions and were inseminated at spontaneous estrus were utilized for the study. Cows in treatment group (n=16) were administered with 2.5 ml of injection Gonadotropin Releasing Hormone (GnRH) on the day of AI. Cows in control group (n=17) served as a control without any treatment. Blood samples were collected from all the cows on the day of AI and day 6 post-AI for serum progesterone estimation. Pregnancy diagnosis was done on 45th day post-AI. There is no significant difference in the serum progesterone concentration between the two groups on the day of AI but there was significant difference on day 6 post-AI. The overall conception rate obtained in control and treatment groups were 29.41 % and 43.75 % respectively.

Key words: Repeat breeder cows, GnRH, serum progesterone, conception rate.

INTRODUCTION

Repeat breeding syndrome is responsible for long inter calving interval leading to huge economic losses to dairy farmers by affecting their livelihoods. Even though many factors are responsible for repeat breeding problem, ovulatory failure, delayed ovulation and embryonic death appear to be the major problems under field conditions. Ullah *et al.* (1996) reported higher pregnancy rates in dairy cows injected with GnRH at the time of AI due to higher preovulatory LH surges, increased progesterone secretion following ovulation and enhanced embryo survival. However, studies in repeat breeder cows maintained under field conditions were scanty. Therefore, a field trial was designed to study the effect of administering an injection of GnRH at time of AI on serum progesterone on day 6 post-AI and pregnancy rate in repeat breeder cows.

MATERIALS AND METHODS

Apparently healthy thirty three repeat breeder cows maintained by the farmers at different villages in Puducherry region were selected for the study. The animals were randomly assigned to two groups. All the cows were inseminated on standing estrus with frozen semen straws. One group of 16 cows (Treatment group) received an intramuscular injection of 10 mcg GnRH analogue (Buserelin) at the time of AI. Cows in another group (Control group) (n=17) served as a control without any treatment. Blood for serum progesterone estimation was collected from all the repeat breeder cows on the day of AI and day 6 post-AI. Serum samples were stored at -20°C and progesterone estimation was done using commercially available Progesterone ELISA kits. On 45th day post-AI, pregnancy verification was done by rectal palpation and first service conception rate was calculated in both the groups. Animals that have returned to estrus following AI were re-inseminated and the second service conception rate was also considered. The first service, second service and overall conception rate were calculated and statistically compared as per Snedecor and Cochran (1994).

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RESULTS AND DISCUSSION

The mean serum progesterone concentration on the day of AI and day 6 post-AI are presented in Table 1. There is no significant difference in the mean serum progesterone concentration on the day of AI between the treatment and control groups. The mean serum progesterone concentration on day 6 post-AI was significantly ($P<0.05$) higher in treatment group compared to control group. The results of the present study concur with the findings of Ullah *et al.* (1996) who reported increased progesterone production following GnRH injection at the time of estrum in dairy cows. Higher progesterone level following ovulation in animals treated with GnRH injection at the time of AI has been attributed to increased proportion of large luteal cells in the CL and possibly due to increased concentration and pulse frequency of FSH secretion (Mee *et al.,* 1993).

The first service, second service and overall pregnancy rates in control and treatment groups are presented in Table 2. Though statistically non-significant, the pregnancy rates in first service and second service were higher in GnRH treated cows compared to cows without GnRH treatment. Similarly, there was a considerable increase in overall pregnancy rate in treatment group (43.75 %) compared to control group (29.41 %). The result was in agreement with the findings of Stevenson *et al.* (1990) who after reviewing eight studies concluded that injection of GnRH at the time of

AI in repeat breeder cows improves the pregnancy rate compared to untreated repeat breeder cows. Similarly, Iftikhar(2009) stated that the administration of GnRH analogue at the time of AI increased the conception rate in repeat breeding crossbred cow. Increased pregnancy rate in GnRH treated group might have prevented ovulation failure or might have resulted in a small variation in the time between the onset of estrus and ovulation by enhancing the preovulatory LH surge (Kaim *et al.,* 2003; Mee *et al.,* 1993). Further, in this study, GnRH at the time of AI in repeat breeder cows was found to increase the serum progesterone concentration on day 6 post-AI compared to control group. BonDurant *et al.* (1991) proposed that GnRH may reduce early embryonic mortality by enhancing the luteinisation of thecal and granulosa cells through the increased LH surge. Higher pregnancy rate following second service in GnRH treated group in the present study may be due to higher progesterone level in the second estrous cycle as Mee *et al*. (1993) and Ullah *et al*. (1996) reported higher progesterone level during subsequent estrous cycle in GnRH treated animals.

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Table 1. : Serum progesterone levels (ng/ml) on the day of AI and day 6 post-AI in control and treatment groups (Mean ± SE).

Day of blood collection	Groups	Progesterone level (ng/ml) Mean ± SE	p-value
Day of estrum	Control	0.52 ± 0.06[a]	0.559
	Treatment	0.49 ± 0.04 [a]	
Day 6 post-AI	Control	2.09 ± 0.09 [a]	0.04
	Treatment	2.28 ± 0.57 [b]	

Means bearing different superscripts (a, b) within a column differ significantly P≤ 0.05

Table 2 : Conception rates in control and treatment groups.

Groups	I service (n)	II service (n)	Overall (n)
Control (n= 17)	17.65 %(3/17)	14.29 %(2/14)	29.41 %(5/17)
Treatment (n=16)	25.00 %(4/16)	25.00 %(3/12)	43.75 %(7/16)