

## **EFFECT OF ADMINISTRATION OF GnRH AT DIFFERENT STAGES OF ESTRUS CYCLE ON FERTILITY IN NORMAL CYCLICAL COWS\***

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**Abstract:** A total number of 54 normal cyclic cows were administered with GnRH at day 0, 5 and 11 of the oestrus cycle. All the animals were inseminated with good quality frozen semen about 12-24 hours after the onset of estrus. Pregnancy was confirmed per rectum after 60 days of insemination. The serum samples were collected from all groups of cows on day 0, 5, 11 and 16 of the estrous cycle for Progesterone assay. The conception rate was 38.46, 23.07, 30.76 and 23.07 per cent in groups I, II, III and IV (control) group respectively.

**Keywords:** Normal cyclical cows, GnRH, Conception rate, Buserelin acetate.

### **Introduction**

Reproductive depletion is a major cause of production loss in cattle affecting the wealth of the dairy producers. In an attempt to increase pregnancy rate, various hormonal treatments like Gonadotropin releasing hormone (GnRH) and its analogues have been administered to repeat breeder and normal cyclic cows prior to artificial insemination (Mee *et al.*, 1993) or at the time of artificial insemination (Nakao *et al.*, 1983) or during the mid-cycle following artificial insemination (Mac Millan *et al.*, 1986). Hence, this study was proposed to assess the efficiency of GnRH (Buserelin) in augmenting fertility in normal cyclic cows

### **Materials and Methods**

A total number of 54 normal cyclic cows brought for artificial insemination and infertility treatment to the Gynaecology unit of Madras Veterinary College Hospital, Chennai were utilized for this study. Animals were divided into three treatment groups like Group I, II, III and Group IV as a control each comprise of 13 normal cyclic cows. Group I, II, and III were treated with 10 µg or 2.5 ml of Buserelin intramuscularly at the time of insemination, on

day 5 and on day 11 after insemination, respectively. Group IV was received placebo treatment at the time of artificial insemination.

All the animals were inseminated with good quality frozen semen from the same bull and by the same inseminator about 12-24 hours after the onset of estrus. Pregnancy was confirmed per rectum after 60 days of insemination.

The serum samples were collected from all groups of cows on day 0, 5, 11 and 16 of the estrous cycle for Progesterone assay. The progesterone assay was carried out using commercial RIA kit employing solid phase radio immuno assay technique. The data were statistically analyzed as per the procedures described by Snedecor and Cochran (1989).  $\chi^2$  test was used to analyze the conception rate in the different treatment groups. The mean plasma progesterone concentration in different treatment groups were analyzed by randomized block design.

### Results and Discussion

The results of conception rate were summarized in Table 1. In the present study, the normal cyclic cows that received Buserelin at the time of insemination (0 day), on day 5 and on day 11 after insemination showed a conception rate of 38.46, 23.07 and 30.76 per cent, respectively. Increase in conception rates in normal cyclic cows treated with GnRH on day of insemination was reported by several authors (Lee *et al.*, 1983; Nakao *et al.*, 1983 and Vamerzani *et al.*, 1999). The increased conception rate in normal cyclic cows could be due to the beneficial effect of Buserelin administration on the ovulation. There was no difference in conception rate between normal cyclic cows treated with Buserelin on day 5 and control groups. The failure of GnRH to improve the conception rare in this study could be due to a series of embryo-uterine-ovarian interaction, some of which might be modified by Buserelin treatment as suggested by Mac Millan *et al.* (1986)

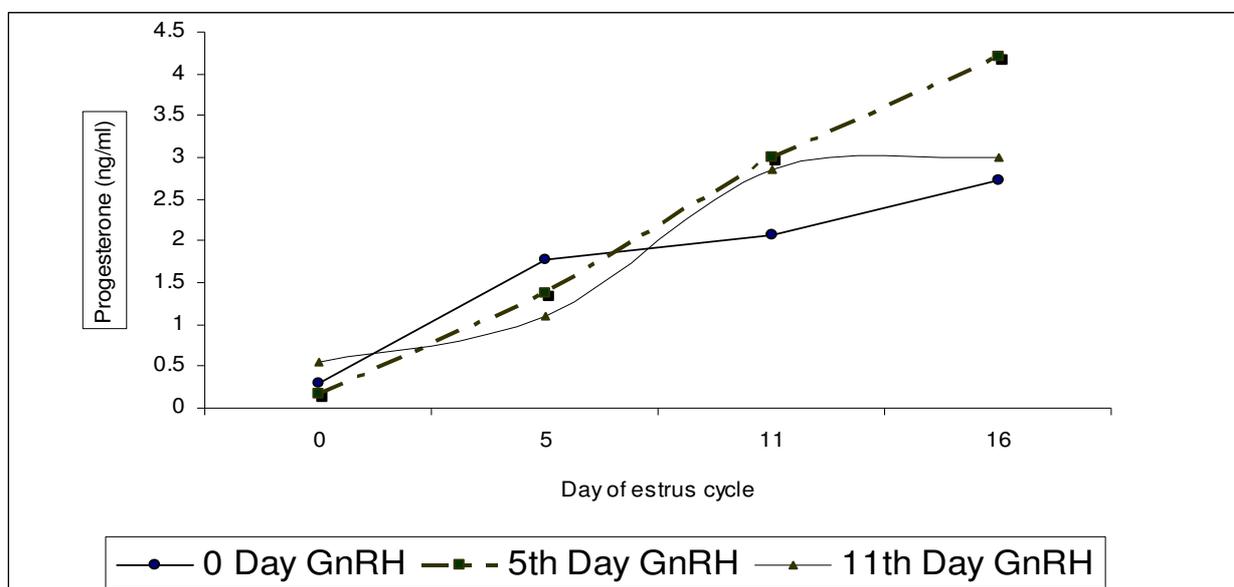
**TABLE –1**

**Conception rate in normal cyclic cows treated with Buserelin (GnRH) at the time of insemination, at day 5 and 11 post insemination**

Group	GnRH treatment	Number of cows inseminated	Number of cows conceived	Conception rate (%)
I	Day 0	13	5	38.46
II	Day 5	13	3	23.07
III	Day 11	13	4	30.76
IV	Control	13	3	23.07

FIGURE – 1

**Mean plasma progesterone level (ng/ml) during day 0, 5, 11, 16 of the estrous cycle in normal cyclic cows after Buserelin (GnRH analogue) treatment, at the time of insemination, at day 5 and 11 post insemination**



The conception rate in the normal cyclic cows received Buserelin acetate on day 11 after insemination was 30.76 per cent, which was in accordance with the observation of Mac Millan *et al.* (1986). The possible reason for the increase in conception rate in normal cyclic cows following administration of GnRH on day 11 post insemination could be due to develop their own anti-luteolytic ability as reported by Mee *et al.*, (1993).

The mean plasma progesterone levels in normal cyclic cows during day 0, 5, 11 and 16 of the estrous cycle after Buserelin treatment were found to be  $0.10 \pm 0.04$ ,  $1.66 \pm 0.26$ ,  $4.13 \pm 0.43$  and  $4.36 \pm 0.42$  ng/ml at the time of insemination;  $0.38 \pm 0.26$ ,  $1.5 \pm 0.15$ ,  $2.59 \pm 0.85$  and  $4.53 \pm 0.20$  ng/ml on day 5 post insemination;  $0.31 \pm 0.12$ ,  $1.70 \pm 0.25$ ,  $4.0 \pm 0.75$  and  $5.3 \pm 0.63$  ng/ml on day 11 post insemination, respectively (Fig.1). The mean plasma progesterone levels in normal cyclic cow was found to be non significant between treatment and highly significant between days within treatment. In this study, the improved conception rate in normal cyclic cow when Buserelin was administered at the time of insemination observed could be due to the beneficial effect of GnRH on the aberrations of ovulation (Dekriuf, 1978) and may not be related to progesterone levels (Lusy and Stevenson 1986).

## Summary

Normal cyclic cows divided into three treatment groups (I to III) were treated with 10 µg Buserelin at the time of insemination, on day 5 and on day 11 post insemination respectively. The conception rate was 38.46, 23.07, 30.76 and 23.07 per cent in groups I, II, III and IV (control) group respectively. It is inferred that at the time of artificial insemination improve the conception rates in normal cyclic cows.

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