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Effect of GnRH on Ovarian Activity in Postpartum Anestrus Sahiwal Cows

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Abstract

A total of 14 Sahiwal cows were selected from bull mother experimental farm, Anjora, Durg with more than 65 days postpartum anestrus were randomly divided into two groups. Animals (n = 7) of treatment group were given injection GnRH @ 10 µg intramuscularly on day 0, while those (n=7) of control group were given 2.5 ml normal saline intramuscularly. The animals in both the groups were monitored at three days interval for 24 days, *i.e.,* on day 0, 3, 6, 9, 12, 15, 18, 21 and 24 using trans-rectal ultrasonography (5-7.5 MHz) for development of ovarian follicles, ovulation and corpus luteum formation. Significantly larger follicles were observed on day 3, 12 ($p<0.05$) and 24 ($p<0.01$) in GnRH treatment group than control group, suggesting folliculogenic and ovulatory effect of GnRH over 3-12 days period, with establishment of cyclicity in anestrus cattle.

Introduction

Fertility and breeding efficiency of dairy animals play a pivotal role in dairy economics (Peter *et al.,* 2009). Any deviation in the breeding rhythm results in a progressive economic loss due to widening of dry period during the life span of animal (Dudhatra *et al.,* 2012). If animal having short inter-calving period better will be its productive life and more number of lactation. Anestrus is a period of sexual quietude in which the animal fails to exhibit normal estrous cycles and manifestation of heat and it is one of the major causes of economic loss in dairy industries. Cows are regarded as physiologically anestrus for up to 60 days following parturition, but if it is beyond that then it becomes a pathological condition. Postpartum fertility is affected by several factors such as breed, plane of nutrition, milk yield, suckling, uterine involution, season of calving etc (Baruselli *et al*., 1997; Pipaon *et al.,* 2002).

In general clinical practice at commercial dairy farms, ovarian activity in animals can be assessed by observing behavioural signs of estrus, per

rectal examination for presence of corpus luteum, blood plasma progesterone level (0.1-2.2 ng/ml) in non-pregnant cows, (Muhammad *et al.,* 2000) and ultrasound examination. Ultrasound scanning has been reported to be a reliable method of observing ovarian dynamic (Rajamahendran *et al*., 1994) and determining the patterns of postpartum resumption of ovarian activity (Rajamahendran and Taylor, 1990), and diagnosing silent estrus, anestrus and cystic ovarian conditions (Islam *et al*., 2013), thus useful in reducing the calving interval. This study was aimed at observing follicular dynamics over first 24 days following GnRH single injection in postpartum anestrus cows.

Materials and Methods

A total 14 Sahiwal cows from bull mother experimental farm, Anjora, Durg with more than 65 days postpartum anestrus were selected for present study. The cows were randomly divided into treatment (n=7) and control (n=7) groups. The cows in treatment group were administered intramuscularly with 10 µg Buserline acetate (Inj. Gynarich @ 2.5 ml, Intas Pharma, Ahmedabad), while the animals in control group were administered with 2.5 ml normal saline intramuscularly as a placebo. The animals in both the groups were monitored at three days interval up to 24 days, *i.e.,* on day 0, 3, 6, 9, 12, 15, 18, 21 and 24 using trans-rectal ultrasonography (5-7.5 MHz, Aloka) for development of follicles, ovulation and corpus luteum development in the ovaries. The data on ovarian activity (follicle size) in control and treatment groups was compared by students paired't' test (Snedecor and Cochran, 1994).

Table 1: Mean (±SE) diameter of largest follicles in control and treatment groups of postpartum anestrus Sahiwal cows

Days	Follicular diameter (mm)	
	Control group (n=7)	Treatment group (n=7)
0	4.88±0.80	4.81±0.71
3	4.52±0.44	6.14±0.66*
6	6.15±0.49	6.94±0.55
9	6.56±1.05	7.46±0.45
12	5.28±0.87	6.75±0.81*
15	6.41±0.79	6.72±0.83
18	6.16±0.57	6.12±0.63
21	7.48±0.15	7.55±0.45
24	5.12±1.87	8.06±0.43**

*/**Significant difference at p<0.05/ p<0.01) between control and treatment groups.

Results and Discussion

In the present study, significantly higher (p<0.05) number of animals came in estrus in treatment group (57.14%) than control group (28.57%) within study period of 24 days between March-April. The mean follicular diameters of largest follicles studied in control and treatment groups on day 0 3, 6, 9, 12, 15, 18, 21 and 24 revealed significantly larger follicles on day 3, 12 (p<0.05) and 24 (p<0.01) in GnRH treatment group than control group (Table 1). This can be attributed to effect of GnRH through pituitary on ovarian follicles creating initiation of follicular wave in three days followed by lutenization and/ or ovulation of dominant follicle around day 12 and again establishment of cyclicity and dominant follicle around day 12 post-treatment. Similar findings were also reported by Lucy *et al.* (1992) in multiparous Holstein cows, Ruiz-Cortés and Olivera-Angel (1999) in suckled zebu (*Bos indicus*) cows and Noseir (2003) in native postpartum dairy cows.

Conclusion

Significant numbers of larger follicles were observed on days 3, 12 and 24 in GnRH treatment group as compared to control groups of anestrus Sahiwal cows suggesting beneficial folliculogenic effect of drug with initiation of follicular wave pattern with ovulation of dominant follicle and establishment of normal cyclicity in most of the animals.

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Conflict of Interest:

All authors declare no conflict of interest.

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