

Comparative Study of after Insemination Use of CIDR and GnRH in Fertility Rate Improvement in Repeat Breeder Cows

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Abstract: The aim of current study is to compare fertility rate improvement by using Controlled Internal Drug Release (CIDR) or GnRH (Gonadorelin) in repeat breeder cows. A total of 150 repeat breeder cows with healthy genital tract in clinical examinations were selected and divided into 3 groups of 50 cows group⁻¹. In group 1, CIDR is used in day 5 until 12 after insemination. In group 2, an injection of Gonadorelin was done in day 11 after insemination for each cow and group 3 (control), received no treatment. The results showed fertility rate of 28, 16 and 12% in group 1, 2 and 3, respectively. There were significant differences in fertility rate between group 1 and 3 ($p = 0.0092$) and group 1 and 2 ($p = 0.04$). In conclusion, the use of CIDR is more efficient than single dose of Gonadorelin in treatment of repeat breeder cows.

Key words: Repeat breeder, cow, GnRH, progesteron, infertility, CIDR, Iran

INTRODUCTION

Infertility is one of the reasons for culling in dairy farms. Selection for high milk production has had adverse effect on fertility. In a period of time 10% of all cows were encountered a reproductive problems (Asdell, 2008). In a survey in United States, 22% of cows were culled for reproductive problems. Bage *et al.* (2002) showed 3.7% of cows were culling for subfertility. Causes of infertility and anestrus in cows are various such as anatomical, hormonal and genital dysfunctions.

There are many different techniques for fertility improvement. Hormonal therapy had been more effective in some researches. Daily injection of progesterone is used for ovulation and heat control for the first time in 1948 (Casid *et al.*, 1984). Alldrich (1994) found that 50% of infertile ovulated cows had lower plasma progesterone concentrations in comparison with pregnant cows in 6 days after ovulation.

GnRH is luteotropic and its injection after ovulation stimulates corpus luteum activity or leads to formation of accessory corpus lutea. Asdell (2008) showed higher pregnancy rate after injection of GnRH in day 11 after 3rd insemination in comparison with first (11.5%) and 2nd (15.6%) insemination without any GnRH injection. Shelton *et al.* (1990) improved pregnancy rate from 50.6-60% by an injection of GnRH in day 11 after

insemination. The aim of current study is to compare fertility rate improvement by using CIDR or GnRH (Gonadorelin) in repeat breeder cows.

MATERIALS AND METHODS

This study was done in a big Holstein dairy farm in East Azerbaijan province, Northwest Iran that have moderate climate. Cows were bred in open shield system and fed Total Mixed Ration (TMR) by feeder. Alfalfa hay, corn silage, barley, soybean meal, mineral and vitamin supplements, etc., were the major components of the TMR. Milking was done 3 times a day and mean milk record was 30 ± 1 kg/cow/day. Per parturient cows were transferred to parturition boxes and monitored for 30 days after parturition.

A total of 150 repeat breeder cows (at least 3 times inseminated and with regular heat cycle) that had intact reproductive tract in rectal and sonographical examination were selected and divided into 3 groups of 50 cows. Group 1 cows received CIDR (Pfizer pharmaceutical co.) intra vaginally from day 5-12 after insemination. Group 2 cows were injected (3 mL case^{-1}) in day 11 of pregnancy with a single dose of GnRH analogue (Vetaroline®, Luliberin-A, Aburaihan, Iran IM). Group 3 (control group) did not receive any treatment. Pregnancy diagnosis was done in day 35 after insemination by ultrasonography.

Chi-square test is used to detect any significant differences in fertility rate improvement between groups in instat statistical software.

RESULTS AND DISCUSSION

According to the Table 1, the best result was in CIDR treated group. Differences in pregnancy rate between group 1 and 3, 1 and 2 were significant ($p = 0.009$ and $p = 0.04$, respectively) but no significant difference was seen between control and GnRH treated groups ($p = 0.68$). In most farm animals, progesterone is essential for pregnancy. Detecting normal corpus luteal function by rectal examination is impossible. Milk or plasma progesterone concentration can demonstrate corpus luteal function. Long low progesterone concentration after ovulation is reported to 15% of all cows in some dairy farms.

Fetuses encountered low progesterone concentrations between days 5-12 of pregnancy do not develop normally and may abort. Both GnRH and progesterone are used to improve luteal function. Ryan *et al.* (1995) in a similar survey showed fertility rate improvement in group of cows that received twice injection of GnRH ($10 \mu\text{g case}^{-1}$) at insemination and 12 h after insemination in comparison with another group that received a single dose of GnRH at insemination only. He concluded GnRH increases ovulation rate and luteal

function. GnRH compounds also cause better maternal diagnosis of pregnancy indirectly by improving luteal function and more fetal growth that leads to more synthesis of bovine trophoblastic protein-1. Significant increase of pregnancy in CIDR group in comparison to GnRH group may be due to direct effect of progesterone on fetal development than indirect effect of GnRH.

CONCLUSION

The results showed progesterone treatment is an effective method to improve fertility in repeat breeder cows.

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Table 1: Comparative pregnancy rate in different groups

Treatments	Pregnancy diagnosis					
	Positive		Negative		Total	
	No.	%	No.	%	No.	%
CIDR (1)	14 ^b	28	36	72	50	100
GnRH (2)	8 ^a	16	42	84	50	100
Control (3)	6 ^b	12	44	88	50	100

^{a, b}Differences between similar words are significant ($p < 0.05$)