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Comparison of PRID+$PGF_{2\alpha}$+GnRH and GnRH+$PGF_{2\alpha}$+GnRH Protocols in the Treatment of Postpartum Anestrus Cows

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Abstract: The objective of this study was to determine the effects of two protocols on fertility parameters of postpartum anestrus cows. Fifty postpartum anestrus cows were used as material of the study. In group 1 (n:25), postpartum anestrus cows received PRID on day 0 with ostradiol benzoate (10 mg, vaginal capsule) and $PGF_{2\alpha}$ injection on day 8th and GnRH injection on the day 9th. The PRID was removed on day 9th and cows were inseminated after the detection of estrus. In group 2 (n:25), postpartum anestrus cows received GnRH on day 0, $PGF_{2\alpha}$ on day 7th and GnRH on day 9th. Cows were inseminated after the detection of estrus. The 2.15±0.98 and 1.05±0.56 days were found between the end of the treatment and time of behavioral estrus in group 1 and 2, respectively. The percentages of estrus detection were 83.3% (20/24) in group 1 and 68% (17/25) in group 2 ($p>0.05$). The pregnancy rates after artificial insemination were 60% (12/20) and 47.05% (8/17) in group 1 and 2, respectively ($p>0.05$). There was not a statistical significant difference between estrus rates and pregnancy rates in group 1 and 2. As a result, the effects of two protocols in postpartum anestrus cows increased the reproductive performance; furthermore, it was effective in regulation of cycle and observation of estrus.

Key words: PRID, GnRH, $PGF_{2\alpha}$, postpartum anestrus, cow, Cyprus

INTRODUCTION

The postpartum period plays a pivotal role in cattle reproduction. The duration of postpartum anestrus has an important influence on reproductive performance (Peter *et al*., 2009). The early resumption of normal ovarian activity accompanied by visible estrus symptoms is essential for the optimal calving interval of 365 days (Zdunczyk *et al*., 2002; McLeod and Williams, 1991; Schmidt, 1989). Postpartum anestrus defined as a lack of estrus until 60 days postpartum is the major factor causing elongation of this interval and in consequence, substantial economic losses (Lamming, 1980; Mwaanga and Janowski, 2000; Senger, 1994). Incidences of postpartum anestrus may vary among herds from 10-40% (Zdunczyk *et al*., 2002; Martinez and Thibier, 1984; Mwaanga and Janowski, 2000). It has been suggested that in high-yielding dairy herds, there is increased incidence of anestrus (Berger *et al*., 1981; Etherington *et al*., 1991; Opsomer *et al*., 1996). Perhaps increased partitioning of energy to milk production can result in anestrus by delaying resumption of ovarian activity. However, factors such as limited energy intake, lower body reserves and postpartum diseases can also delay the return to cyclicity (Peter *et al*., 2009).

There are four clinical forms of anestrus: Silent heat; cystic ovarian disease; ovarian afunction and corpus luteum pseudograviditatis (Zdunczyk *et al*., 2002; Mwaanga and Janowski, 2000). Rectal palpation is a main method used for clinical evaluation of ovarian activity in dairy herds but it may cause high proportion of misdiagnosed and incorrectly treated animals (Zdunczyk *et al*., 2002; McLeod and Williams, 1991). False diagnoses can be avoided by ultrasound scanning or progesterone determination in milk or blood (Kalis and Van De Wiel, 1980; Pieterse *et al*., 1990).

Researchers have treated postpartum anestrus cows with progesterone (Hatler *et al*., 2006) or with concurrent GnRH followed by $PGF_{2\alpha}$ (Ambrose *et al*., 2004). In the treatment of postpartum anestrus, combination of GnRH and $PGF_{2\alpha}$ can also be used (day 0, GnRH; day 7, $PGF_{2\alpha}$; and day 9, GnRH) with or without timed-insemination (Ambrose *et al*., 2004; Crane *et al*., 2006). The objective of this study was to determine the effects PRID+$PGF_{2\alpha}$+GnRH and GnRH+$PGF_{2\alpha}$+GnRH protocols on fertility parameters of postpartum anestrus cows.

MATERIALS AND METHODS

This study was conducted on 50 Holstein cow in five commercial dairy herds, located in Ankara province in Turkey from January-July, 2009. About 50 Holstein cows which did not show estrus cycle until the 60th day of postpartum were controlled by rectal palpation and included this study as postpartum anestrus cows. About 50 Holstein cows which did not show estrus until the

60th day of postpartum are divided into 2 groups. In group 1, postpartum anestrus cows received PRID® (1.55 g Pogesterone; Sanofi Doou Ilac, Ankara, Turkey) on day 0 with ostradiol benzoate (10 mg, vaginal capsule) and $PGF_{2\alpha}$ (Yliren, Farma Intervet) injection on day 8th and GnRH (Receptal® inj., 0.0042 mg buserelin asetat mL^{-1}, Intervet Ltd., Istanbul, Turkey) injection on day 9th. The PRID was removed on day 9th and cows were inseminated after the detection of estrus. In group 2 (n:25), postpartum anestrus cows received GnRH on day 0, $PGF_{2\alpha}$ on day 7th and GnRH on day 9th.

Cows were inseminated after the detection of estrus. In both groups, cows which did not show estrus after the treatment were not included to the statistical analysis. The uterus of cows that could not be observed in estrus was palpated per rectum 45-50 days after insemination to determine pregnancy status. The differences in estrus rates and pregnancy rates between two protocol were analyzed by using Chi-square (χ^2) test and SPSS 14,01.

RESULTS AND DISCUSSION

Consummately, 50 cows were used in the study. About 25 of them were allocated in group 1 and 25 in group 2. In group 1, one PRID got lost in the study and group 1 was evaluated from 24 cows. Estrus rate and timing of estrus in group 1 and 2 are shown in Table 1.

In group 1, 20 cows were detected in estrus and these cows were inseminated artificially. About 12 cows were palpated as pregnant by rectal palpation 45-50 days after the artificial insemination in group 1. In group 2, 17 cows were detected in estrus and these cows also were inseminated artificially and 8 cows were palpated as pregnant by rectal palpation in group 1, 45-50 days after artificial insemination (Table 2).

The main objective of this study was to compare the effectiveness of the PRID+$PGF_{2\alpha}$+GnRH and GnRH+$PGF_{2\alpha}$+GnRH protocols in the treatment of postpartum anestrus. The treatments of postpartum anestrus cows have been evaluated for estrus rates, timing of estrus and pregnancy rates and no statistically significant difference were found between estrus rates and pregnancy rates of groups in the study.

Timing of estrus was detected after 2.15±0.98 days in group 1 and 1.05±0.56 day in group 2 in this study.

Table 1: Estrus rate and timing of estrus in group 1 and 2

Groups	Estrus rate	Timing of estrus (days)
1 (PRID+$PGF_{2\alpha}$+GnRH)	83.3% (20/24)	2.15±0.98
2 (GnRH+$PGF_{2\alpha}$+GnRH)	68.0% (17/25)	1.05±0.56

Table 2: Pregnancy rates at day 45-50 in group 1 and 2

Groups	Pregnancy rates at day 45-50
1 (PRID+$PGF_{2\alpha}$+GnRH)	60.0% (12/20)
2 (GnRH+$PGF_{2\alpha}$+GnRH)	47.05% (8/17)

($p>0.05$)

Xue reported 52.0±5.8 h as a time of estrus after removal PRID and Ozyurtlu reported 3.22±0.97 days as a time of estrus in their study. In group 1, same results were observed after removal of PRID in postpartum anestrus cows. Aral and Colak reported 62.6 h after $PGF_{2\alpha}$ injection as time of estrus in GnRH+$PGF_{2\alpha}$+GnRH protocol. Besides similar results were obtained in group 2.

Many researchers reported estrus rates between 66.7-93.3% in the studies of PRID. Ozyurtlu reported 75% estrus rates after PRID removal. Also, Zonturlu reported 100% estrus rates in anestrus cows. In this study, estrus rates were forund 83.3% in PRID groups and results were similar to the other study groups. After GnRH+$PGF_{2\alpha}$+GnRH protocols estrus rates reported 15.4% by Aral and Colak, 20% by De Jarnette *et al.* (2001) and 78% by LeBlanc *et al.* (1998). The estrus rates of this study in GnRH+$PGF_{2\alpha}$+GnRH group were found higher than the result of De Jarnette *et al.* (2001) and they were found lower than the results of Le Blanc *et al.* (1998). Estrus rates were found 68% in this study.

Pregnancy rates were found 60% in this study. Zonturlu and Ozyurtlu reported lower pregnancy rates than the results, 14.28 and 33.33%, respectively. In the studies of PRID, pregnancy rates reported between 14.28 and 73% after first inseminations (Lopez-Gatius *et al.*, 2001; Penny *et al.*, 2000).

In the group of GnRH+$PGF_{2\alpha}$+GnRH, 37.83% pregnancy rates were reported by Yilmaz *et al.* (2011). Also, pregnancy rates were observed in difeerent rates between 32 and 76.92% in many studies (Pursley *et al.*, 1997; Cevik *et al.*, 2010; Yilmaz *et al.*, 2011). In this study, pregnancy rates were found 47.05% and it was similar to many results of GnRH+$PGF_{2\alpha}$+GnRH studies.

CONCLUSION

This study showed the effect of PRID+$PGF_{2\alpha}$+GnRH and GnRH+$PGF_{2\alpha}$+GnRH protocols on estrus rates, timing of estrus and pregnancy rates. It is suggested that both protocols are important approaches in the treatment of postpartum anestrus cows. However, in the comparison of the results of two protocols in the treatment of postpartum anestrus cows, no statistically significant results were found.

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