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Administration of PGF2α and Antibiotic in Dairy Cows during Early Postpartum Period and Their Effect on Various Fertility Parameters

Akshay Sharma*, Madhumeet Singh, Amit Sharma and Pravesh Kumar

Department of Veterinary Gynecology and Obstetrics, College of Veterinary and Animal Sciences, Himachal Pradesh Agricultural University, Palampur – 176062, India
**Corresponding author*

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A B S T R A C T

The objective of this study was to investigate the effect of $PGF_2\alpha$ and antibiotic treatment on fertility parameters in dairy cows. After parturition, 24 cows were assigned into four treatment groups which were $PGF_2\alpha$ administration on day 8 and 25 postpartum (n=6 each), antibiotic administration on day 1 to 5 postpartum (n=6) and untreated control group (n=6). Monitoring of various fertility parameters was done until next conception in all the groups. Dairy cows treated with $PGF_2\alpha$ on day 8 after calving were having numerical difference but there was no statistical difference (P>0.05) in fertility parameters recorded.

Introduction

Reproductive performance in dairy cows is a key factor affecting profitability of the dairy industry (Galvao *et al.*, 2013). Postpartum administration of $PGF_2\alpha$ enhances the uterine contractility and lochial clearing from the uterus after calving (Nanda *et al.*, 2003). Also, antibiotic administration helps in improving the uterine defense and consequently reducing persistent inflammation in the postpartum uterus (LeBlanc, 2008).

Therefore, the main objective of this study was to find the effectiveness of $PGF_2\alpha$ and antibiotic administration during early postpartum period on fertility parameters in dairy cows.

Materials and Methods

The study was carried out on 24 post-parturient dairy cows (Jersey and Jersey crossbred) of Livestock farm, CSKHPKV, Palampur. Dairy cows of first two treatment groups were administered with 500 µg $PGF_2\alpha$ analogue (Cloprostenol; Zydus Animal Health Ltd.) intramuscularly either on day 8 (PG8) or 25 (PG25) postpartum. In third group, cows were administered with antibiotic Ciprofloxacin intramuscularly for first 5 days after calving (C-Flox Power; Intas Pharmaceuticals Ltd.). The fourth group served as untreated control (n=6 in each group). Postpartum reproductive performance was assessed by evaluation of days to first artificial insemination (AI), number of inseminations per conception and calving to

conception interval (days open), which was followed by pregnancy diagnosis (60 days after successful AI) in different treatment and control groups. The data was statistically analyzed using one way ANOVA with SAS (Statistical Analysis Software), SAS® 9.2 TS Level version 2M2 for windows.

Results and Discussion

The present study revealed that the time required for mean time required for days to first A.I. was numerically shorter (86.00±4.21 days pp) in the PG8 group while in PG25, antibiotic and control group, it was 97.67±7.58, 94.33±6.96 and 97.00±8.99 days, respectively. However, there was no significant difference (P>0.05) between different treatment and control groups. Sharawy *et al.,* (2015) also reported a shorter interval from calving to first A.I. (i.e. 60.94 ± 2.9 days pp) without significant effect of $PGF_2\alpha$ administration during early postpartum period. During early postpartum period, exogenous $PGF_2\alpha$ administration can increase the rate of uterine involution which results in evacuation of bacterial contamination from the uterus and subsequently improve conception rate (Nanda *et al.,* 2003). Contrarily, administration of $PGF_2\alpha$ during the early postpartum phase was associated with improvement in fertility (Pankowski *et al.,* 1995; Melendez *et al.,* 2004). However, the mean number of inseminations required for conception were less (1.33±0.21) in antibiotic group while in PG8, PG25 and control group, these were 1.50±0.22, 1.50±0.22 and 1.66±0.21, respectively.

Mean time required for calving to conception interval was comparatively shorter (96.50±6.42 days postpartum) in PG8 group while in PG25, antibiotic and control group, it was 106.50±10.85, 101.33±9.46 and 111.00±11.45 days postpartum, respectively without any significant difference (P>0.05) between different treatment and control groups. Our observations support the findings of $PGF_2\alpha$ in the early postpartum period (between 7 and 28 days) reduced the postpartum interval to conception (Sharawy *et al.,* 2015; Sani *et al.,* 2016) and had a positive effect on reproductive performance (Nakao *et al.,* 1997). On the other hand, administration of $PGF_2\alpha$ did not result in any beneficial effect in terms of days open (Sharawy *et al.,* 2015).

The main objective of antibiotic administration was to eliminate the pathogens from the uterus, the induction of the uterine immune system, elimination of the adverse effects of inflammation products on fertility and improvement in future reproductive performance (LeBlanc, 2008). However, antibiotic administration produced no significant difference (P>0.05) from other treatment and control groups in this study.

In conclusion, the administration of $PGF_2\alpha$ and antibiotic in the immediate postpartum period does not improve the reproductive performance significantly, in dairy cows. So, given treatment is not effective after parturition, in order to improve the subsequent reproductive performance.

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