Short Communication

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

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A B S T R A C T

The objective of this study was to investigate the effect of PGF2α and antibiotic treatment on fertility parameters in dairy cows. After parturition, 24 cows were assigned into four treatment groups which were PGF2α 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 PGF2α on day 8 after calving were having numerical difference but there was no statistical difference (P>0.05) in fertility parameters recorded.

Keywords: Dairy cows, PGF2α, Antibiotic, Fertility parameters

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Introduction

Reproductive performance in dairy cows is a key factor affecting profitability of the dairy industry (Galvao et al., 2013). Postpartum administration of PGF2α 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 PGF2α and antibiotic administration during early postpartum period on fertility parameters in dairy cows.

Materials and Methods

The study was carried out on 24 postparturient dairy cows (Jersey and Jersey crossbred) of Livestock farm, CSKHPKV, Palampur. Dairy cows of first two treatment groups were administered with 500 µg PGF2α 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$_2$α administration during early postpartum period. During early postpartum period, exogenous PGF$_2$α 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$_2$α 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$_2$α 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$_2$α 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$_2$α 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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References

Galvao, K.N., Federico P, De Vries A, Schuenemann GM, 2013. Economic comparison of reproductive programs
for dairy herds using estrus detection, timed artificial insemination, or a combination. J Dairy Sci 96: 2681-2693.

LeBlanc, S., 2008. Postpartum uterine disease and dairy herd reproductive performance- A review. The Vet J 176: 102-114.

Melendez, P., McHale J, Bartolome J, Archbald LF, Donovan GA, 2004. Uterine involution and fertility of Holstein cows subsequent to early postpartum PGF2α treatment for acute puerperal metritis. J Dairy Sci 87(10): 3238–3246.

Nakao, T., Gamal A, Osawa T, Nakada K, Moriyoshi M, Kawata K, 1997. Postpartum plasma PGF metabolite profile in cows with dystocia and/or retained placenta, and effect of fenprostalene on uterine involution and reproductive performance. J Vet Med Sci 59(9): 791-794.

Nanda, A.S., Brar PS, Prabhakar S, 2003. Enhancing the reproductive performance in dairy buffaloes: major constrains and achievement. Reprod Suppl 61: 27–36.

Pankowski, J.W., Galton DM, Erb HN, Guard CL, Grohn YT, 1995. Use of PGF2α as a postpartum reproductive management tool for lactating dairy cows. J Dairy Sci 78(7): 1477-1488.

Sani, R.N., Mohammadi HR, Mahdavi A, Dadashpour H, 2016. Effects of different regimens of PGF2α treatment during postpartum on reproductive performance in dairy cows. Braz J Vet Res a Sci 53(4): 1-9.

Sharawy, S., Saleh N, Ghanem M, and Hassan S, 2015. Effect of different treatments at early postpartum period on uterine involution and subsequent reproductive performance in dairy cows. Glob Anim Sci J 3: 155-161.