

Treatment of Retained Placentas in Dairy Cattle with Prostaglandin

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Introduction

Prostaglandins have been shown to be efficacious for treating a variety of reproductive disorders in cattle.¹⁻⁸ The luteolytic effect of prostaglandins on the corpus luteum can be used to advantage for treating pyometra, endometritis, luteal cysts, induction and synchronization of estrus, and pregnancy termination. Recently, it was reported that a synthetic prostaglandin (fenprostalene⁹) was of benefit in the treatment of retained placenta.⁸⁻⁹ However, the efficacy of this treatment has been questioned by some workers. This study was undertaken to a) determine whether the use of fenprostalene for the treatment of retained placenta, was beneficial, and b) to determine if there is a difference in the progesterone level of cows with and without retained placentas. Greater progesterone levels in cows that retain compared to cows without retention could explain fenprostalene's mode of action, since the primary action of prostaglandins is luteolysis of the corpus luteum.

Materials and Methods

Part I

Purebred Holstein cows from a large dairy herd were used for this study. As cows approached parturition, they were put into disinfected and bedded box stalls where they were more closely observed. A record card was placed by each maternity pen to record cow identification, calf identification, sex of calf, time of birth and approximate time of expulsion of the placenta. Alternately, every cow with a placenta retained for eight hours or more was injected subcutaneously with two mls of fenprostalene 8 to 14 hours postpartum.

Except for treatment with fenprostalene, cows with retained placentas were treated similarly after parturition for the retained placenta, metritis and chronic endometritis. Temperatures were obtained daily and if they exceeded 103° F, 18 million units of procaine penicillin was administered subcutaneously once a day until the placenta was expelled. Eighteen to 25 days after calving, all cows that had had retained placentas were treated with a prostaglandin drug and/or infused with oxytetracycline solution. Thereafter, this treatment was given weekly until

involution was complete, and there were no abnormal vaginal discharges. The following were collected in 36 cows treated with fenprostalene and 42 cows not treated with fenprostalene (control):

- A. Number of hours placenta was retained
- B. Number of days treated for metritis (retention of placenta with temperature above 103° F)
- C. Number of treatments for metritis and endometritis required following the expulsion of the placenta
- D. A systematic evaluation of the reproductive tract 30 days after parturition
- E. Number of days to first estrus
- F. Number of days to conception
- G. Number of services for conception
- H. Number of services if the cow did not become pregnant or was sold prior to becoming pregnant

The 30-day postpartum evaluation was based on a numerical grading system previously described.¹⁰ Evaluations were made without knowing the treatment status.

Part II

Progesterone was assayed in 36 cows with and 26 cows without retained placentas for the purpose of elucidating fenprostalene's mode of action.

Results

Part I

Treatment with fenprostalene of cows with retained placentas resulted in a more favorable outcome than in cows not treated. The number of days cows were treated for metritis and the number of additional treatments required was significantly ($P < .05$) fewer in cows treated with fenprostalene (Table 1). The number of hours the placenta was retained, the number of days to first estrus, the number of days to conception, and the number of services for conception were considerably less in cows treated with fenprostalene (Table 2). However, the differences were not statistically significant ($P > 0.05$). The proportion of cows not conceiving, about 20%, was similar in treated and untreated cows. The postpartum evaluation, performed 30 days after parturition, revealed similar findings in both groups.

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TABLE 1. Medical treatment required in dairy cows with retained placentas following treatment with PGF2a-Fenprostalene.

Treatment for Metritis:		Days Treated	
		≤3	>3
Bovilene Treatment	Yes	23(64%)	13(36%)*
	No	16(38%)	26(62%)

Further Treatments Required:		Additional Treatment	
		Yes	No
Bovilene Treatment	Yes	10(29%)*	25(71%)
	No	22(65%)	12(35%)

*Difference between groups statistically significant (p < 0.05).

TABLE 2. Response of dairy cows with retained placentas to treatment with PGF2a-Fenprostalene.

Variable	Bovilene Treatment		No Treatment	
	N	Mean ± SD	N	Mean ± SD
Hours placenta retained	36	96.5 ± 83.3	42	127.0 ± 84.1
Days to first estrus	32	56.3 ± 22.0	38	60.6 ± 33.0
Days to conception	25	100.8 ± 34.6	29	118.1 ± 58.8
Services for conception	25	2.0 ± 1.1	29	2.2 ± 1.4

TABLE 3. Progesterone levels at calving in cows with or without retained placentas.

	Retained Placenta		No Retained Placenta	
	N	Mean ± SD	N	Mean ± SD
No. of Cows	36		26	
High		0.8 ng/ml		0.7 ng/ml
Low		0.0 ng/ml		0.0 ng/ml
Mean		0.0 231 ng/ml		0.227 ng/ml

Part II

The progesterone levels in cows with and without retained placentas were identical (Table III).

All values were low (0.0 ng/ml to 0.8 ng/ml), indicating an absence of luteal tissue in cows at parturition, regardless of whether the placenta is retained or not.

Discussion

It was anticipated that this study would demonstrate whether the PgF2a analogue fenprostalene was beneficial for treatment of retained placenta. However, accumulating adequate numbers in a trial requiring around-the-clock observation and intensive record keeping is burdensome, hence it was decided to terminate the trial after accumulating approximately 40 cows in each group of Part I of the study. Both the number of treatments required for metritis and follow up treatments were significantly reduced in cows treated with fenprostalene. Most of the other measurements also favored the fenprostalene-treated group, although there was no difference in the 30-day postpartum evaluation. If the trial had been continued, additional numbers could likely have provided significant differences in several of the measurements. In a previous study,⁹ animals with retained fetal membranes, treated with fenprostalene, had significantly shorter intervals from calving to placental expulsion, compared to cows not treated (54 hours vs. 96 hours). Also, the incidence of postparturient metritis was less for treated cows (41% compared to 75% for control cows). In light of these findings, fenprostalene is now administered routinely to all cows immediately after parturition.

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