

Comparison of Three Treatment Procedure of Retained Placenta: Manual Removal, Intrauterine Injection of Oxytetracycline and Concomitant Use of Both Methods in Dairy Cows

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Abstract: Retained placenta is defined as the failure to pass all or part of the placenta from the uterus within 24 h of calving. There are several potential causes for placental retention but the effects on the general health of the cow and her subsequent reproductive performance are costly events to the dairyman. In this study which carried out in Tabriz suburb, we used of 30 Holstein cows allocated in the 3 groups and treated as group 1; handling, group 2; oxytetracycline and group 3; concomitant use of method 1 and 2. Based on data revealed that there is a significant difference among group 2 with two other groups. Thus can be state that Method No. 2 is a good way to treatment of retained placenta. The negative effect of retained placentas on subsequent fertility is commonly due to delayed involution of the uterus and chronic endometritis, one of the more common causes of infertility. Some cows with retention are affected with permanent sterility due to pyometra, perimetritis, salpingitis (inflammation of oviducts), ovaritis or severe damage to the endometrium. In most animals, the major economic loss is due to slight to moderate loss of milk and impaired involution of the uterus, thus a delay in conception. Thus, retained placenta must be treated as soon as possible and based on the data oxytetracycline is appropriate method for treatment of this disorder.

Key words: Retained placenta, oxytetracycline, manual removal, dairy cows, uterus, Iran

INTRODUCTION

Retained placenta is defined as the failure to pass all or part of the placenta from the uterus within 24 h of calving. There are several potential causes for placental retention but the effects on the general health of the cow and her subsequent reproductive performance are costly events to the dairyman. The following data include both obvious cases of retained placenta and those of cows sick with metritis with or without obvious placental retention. Retained placenta or metritis requiring systemic therapy occurs in 11-18% of calvings (Bartlett *et al.*, 1986; Erb *et al.*, 1985; Sandals *et al.*, 1979; Van Werven *et al.*, 1992). Cows with toxic early lactation metritis may die and the case fatality rate was estimated from the records at 1% and reported to be 1.5% in 29 California herds (Gardner *et al.*, 1990). Cows not achieving economical milk production and culled due to RP were estimated to occur in 6% of cases (Bartlett *et al.*, 1986). Researchers estimate that veterinary examination and treatment occurs in 10% of cases. The time required for veterinary effort was estimated at 25 h. Treatment with systemic antibiotics occurs in 75% of cases (the estimate) with a drug cost of \$15. Farmer labor required for daily evaluation and the course of treatments was estimated to be 10 min day⁻¹ for 4 days or 0.67 h. Bartlett *et al.* (1986) reported average milk

discard for 7 days and a total of 102 kg. Milk not made due to RP was estimated to be 265 kg by Deluker *et al.* (1991) and 120 kg by Bartlett *et al.* (1986). The researchers selected 250 kg milk loss due to RP. Delay in conception after RP has been reported to be 12 days by Halpern *et al.* (1985), 7 days by Van Werven *et al.* (1992), 32 days by Borsberry and Dobson (1989), 19 days by Martin *et al.* (1986) and 12 days by Bartlett *et al.* (1986). The researchers estimate that 15 days delay in conception is typical.

Retained placenta occurs after many cases of dystocia with milk fever and with many twin births. In most herds with good management, these causes make up the majority of known risk factors for retained placenta and easily lead to the typical 15% incidence. There are occasional herd problems where the incidence is much >15% without being obviously related to the 3 primary predisposing factors. Some of these herds have a problem with subclinical hypocalcemia and others may have selenium or vitamin E responsive problems. In most circumstances, the nutritional management of mature cows for proper body condition and minimal cases of milk fever will also minimize the occurrence of retained placenta. Proper growth rates resulting in heifers calving at 600 kg and selection of calving ease sires are the most important management considerations for prevention of

retained placenta in heifers. Induction of parturition with either corticosteroids, prostaglandin f-2 α or both is sometimes used for management purposes. The incidence of retained placenta is usually about 75% following induced calving.

The finger-in-glove fit of the placental cotyledons in the maternal caruncles provides the large surface area necessary for nutrient and gas exchange between maternal and fetal circulations. Collagenase secreted by the placenta at parturition leads to a weakening of the mechanical link between uterus and placenta. The mechanical actions of uterine contraction and compression of the placentomes loosen and begin the separation. After parturition, the shrinking of the cotyledons as the blood drains from the placenta normally allows the now smaller fingers of the placenta to slip from the glove of the caruncles. Mechanical events, inflammatory events or bad timing due to delayed delivery can all lead to some edema formation in the caruncle and cotyledon that lock the placenta into the uterus. This grip persists until necrosis (read rotting) of the devitalized placenta allows it to detach. Action of leukocytes migrating from the caruncles into the surface of the placenta hastens the necrosis. Some bacteria hasten the necrosis but may also lead to systemic illness for the cow. Several trials of interventions after calving have attempted to reduce the incidence of retained placenta. Oxytocin has long been advocated to expel the placenta after delivery. There are other advantages to the use of oxytocin after calving but it does not reduce the incidence of retained placenta. Oxytocin is already being secreted by normal cows at parturition and it helps contract the uterus and expel a placenta that is fully detached. The contraction of the uterus helps control bleeding from the various sites that may have been traumatized during delivery. If the placenta is not detached from the caruncles oxytocin will not hasten its passage (Miller and Lodge, 1984). Low rates of retained placenta during an experiment that required induction of calving was reported with the use of 10 mg of dinoprost tromethamine (Lutalyse, Pharmacia and Upjohn Co.) given within a few hours of calving (Tross *et al.*, 1986). Researcher conducted a trial in a client herd with 400 calvings to evaluate this as prevention. There was no difference between the prostaglandin treatment and the placebo. A follow up trial was conducted with induced calvings and either dinoprost or cloprostenol and no reduction in the incidence of retained placenta were observed (Garcia *et al.*, 1992). The use of prostaglandins at parturition has yielded mixed results. The use of Lutalyse (Pharmacia and Upjohn) at calving does not reduce the incidence of retained placenta (Stevens and Dinsmore, 1997). However, the use of a

longer acting prostaglandin, fenprostalene no longer marketed in the USA did result in a shorter duration of placental retention and a reduction in subsequent metritis (Herschler and Lawrence, 1984). An experimental injection of collagenase into the placental end of the umbilical artery has been shown to facilitate separation of the placenta from the uterus (Eiler and Hopkins, 1993). This mode of therapy is specific and appropriate for releasing the placenta from the uterus but has not evolved into a practical treatment. Many medications have been placed into the uterus of cows with retained placenta. Veterinarians have sometimes devised very detailed protocols requiring sequential placement of antibiotics and other chemicals into the uterus on various days after calving. To date there is no data supporting the beneficial effects of intrauterine therapy for retained placenta. Some cows do not become sick, do not stink and require no therapy whatsoever. Most cows do become systemically ill and require antibiotic and adjunctive therapy. The aim of therapy is both to minimize illness at the start of lactation so feed intake and milk production will get off to a good start and to reduce the reproductive inefficiency at the start of the breeding period. Researcher does research with many large dairies where therapy of routine problems is administered by the herd staff under my guidance. To insure consistency in treatment programs, protocols have been developed to cover most common conditions including retained placenta and metritis. Fresh cow monitoring is a part of the daily routine on these dairies. Whether your dairy is large or small, the principles of systematic approaches to health problems will help insure that the right cows are treated and with logical interventions. The following is a portion of a typical herd protocol.

MATERIALS AND METHODS

In this study which carried out in Tabriz suburb, researcher used of 30 Holstein cows allocated in the 3 groups as follow:

Group 1: In this group, 72 h after parturition and ensuring the absence of fever, perineal area was washed by benzalkonium chloride 50% with ration of 1:1000. Then after animal constrain, the placenta was took from suspended portion and then by extending into the uterine, the junctions of cotyledon to the caruncle was dissected. It must be noted that in term of animal straining, we used of caudal epidural anesthesia. If junctions are strong, the operation was postponed to 24 h and was prevented from more handling. After removal of the placenta, uterus washing was done with warm saline solution (45°C).

Group 2: In these animals instead of removing of placenta by hand, we used oxytetracycline 10% at the dose of 22 mg kg⁻¹ as intrauterine method.

Group 3: In these animals, we used concomitant methods of groups 1 and 2. To wit after removal of placenta by hands, oxytetracycline 10% at the dose of 22 mg kg⁻¹ as intrauterine method was administrated.

Animals of 3 groups 21 days after parturition were examined through clean test. The Statistical Package for Social Sciences (SPSS Inc., Chicago, IL, USA), Version 13.0 was used for statistical analysis. All data are presented as mean±SEM. Before statistical analysis, all variables were checked for normality and homogeneity of variance by using the Kolmogorov-Smirnoff and Levene tests, respectively. The data obtained were tested by ANOVA followed by Tukey's post-hoc multiple comparison test. The Kruskal-Wallis test followed by Mann-Whitney U post-test was used for the analysis. $p < 0.05$ was considered statistically significant.

RESULTS AND DISCUSSION

Results of the calving interval to fertility in all three groups were collected and showed in Table 1 and Fig. 1. Based on data revealed that there is a significant difference among group 2 with two other groups. Thus can be state that Method No. 2 is a good way to treatment of retained placenta. The basic goal in any treatment of retained placentas is to return the cow's reproductive tract to a normal state as quickly as possible. Partial retention may go unnoticed until complications such as metritis (inflammation of the uterus, Fact Sheet IRM-22) or pyometra (pus in uterus) develop. When noticed, affected

cows may have increased temperature, be off feed, be depressed, have lowered milk production and have a foul smelling vaginal discharge. These animals should be examined and treated both systemically with antibiotics (and possibly with intravenous electrolytes and dextrose fluids) and locally with intrauterine medication by or under the direction of a veterinarian.

There are generally two methods of managing retained placenta when no systemic involvements are present-manual removal and natural separation. Manual removal has long been a common practice but should not be used because of possible injury to the delicate lining of the uterus (endometrium). Some type of antibiotic or antiseptic solution may be placed in the uterus as prescribed by a veterinarian. If the membranes are not released due to poor uterine contractions, the afterbirth may detach without damage by applying slight tension externally to the fetal membranes. Based on recent research on retained placenta, the most common recommendation is to allow the placenta to separate naturally with or without the use of medication. Hormones such as prostaglandins, estrogens and oxytocin may be used to evacuate fluid and debris from the uterus (Miller and Lodge, 1984; Stevens and Dinsmore, 1997). Prostaglandins also may be used in the treatment of pyometra. If evacuation is not successful with hormonal therapy, uterine palpation and irrigation may be recommended using warm water followed by treatment with an antibiotic solution. A series of intrauterine infusions is usually more effective than a single treatment. The length and number of treatments considered should be determined on an individual basis as recommended by a veterinarian. Non-treated cows with placental retention have longer open intervals, fewer first service conceptions and more breedings per conception than cows with retained placentas that were treated with antibiotic solutions. It is extremely important to remember when retained placentas are treated with antibiotics that milk and meat withdrawal requirements must be followed. The selection of one or more antibiotics should be made by a veterinarian (Erb *et al.*, 1985; Thurmond *et al.*, 1993). Prevention of retained placentas, of course is the key. It may be rather difficult to pinpoint an exact cause with so many direct or indirect factors that can be incriminated. The optimum is to maintain a healthy, contented and active cow prior to during and after parturition.

A balanced, limited ration during the 6-8 weeks dry period; sufficient daily exercise; sufficiently large, clean and comfortable calving areas (preferably on pasture) and proper sanitary procedures during the calving period minimize the chances of retention and infections of the reproductive tract. There are several specific preventive measures to follow:

Table 1: Statistical analysis of data obtained from SPSS

Groups	Mean value of calving interval to fertility	SD	p-value
1	103.6	11.37	0.776
2	84.6	13.54	0.004
3	100.0	10.25	0.019

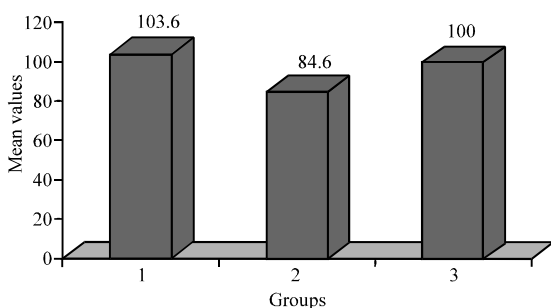


Fig. 1: Comparison of mean value of calving interval to fertility

- In selenium deficiency or borderline areas, the administration of a dietary level of selenium (0.1 ppm) tended to minimize the incidence of retained placentas. Selenium supplementation by injection may also be used
- Vitamin A and D deficient cows have high retention rates. Intramuscular injections of Vitamins A and D may be given 4-8 weeks prior to calving if a deficiency is suspected
- The calcium and phosphorus ratio for the dry cow is extremely important in the prevention of milk fever and in turn, retained placentas. Maintenance of calcium:phosphorus ratio of 1.5:1.0 and 2.5:1.0 is absolutely necessary. Above 2.5:1.0, the incidence of milk fever and retained placenta increase. Supplementary phosphorus may have to be fed to dry cows to maintain the proper ratio as recommended by a veterinarian or nutritionist

CONCLUSION

The negative effect of retained placentas on subsequent fertility is commonly due to delayed involution of the uterus and chronic endometritis, one of the more common causes of infertility. Some cows with retention are affected with permanent sterility due to pyometra, perimetritis, salpingitis (inflammation of oviducts), ovaritis or severe damage to the endometrium. In most animals, the major economic loss is due to slight to moderate loss of milk and impaired involution of the uterus, thus a delay in conception. Thus, retained placenta must be treated as soon as possible and based on the data oxytetracycline is appropriate method for treatment of this disorder.

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