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Effect of intrauterine antibiotic injection 24 hours after insemination on conception rate in cows with endometritis

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ABSTRACT

The aim of this study was to evaluate the effect of intrauterine cephaprin injection 24 hours after artificial insemination on conception rate in cows with clinical endometritis. The study was conducted on a commercial dairy farm included 700 dairy cows. In present study 150 cows with endometritis were selected. Endometritis was detected according to enlarge uterus, cervix and haze vaginal discharge *in estrus. Cows were randomly divided in to three groups (50 cows each). The first group received cephapirin at the first estrus and they inseminated on the fallowing estrus. The second group received cephaprin 24 hours after insemination and the third group received oxytetracycline 24 hours after insemination.14, 16 and 11 cows, from the 1st, 2nd and3rd groups were diagnosed positively pregnant after insemination respectively. There was no significant differences between the three groups (p=0.413). Considering the insignificant differences between treatment and control groups in the case of conception rate and also decrement in interval between calving and the time of first insemination in treatment group, the application of cephaprin 24 hours after artificial insemination in cows with endometritis was suggested.*

Keywords: cows, intrauterine, cephapirin, endometritis, post insemination

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INTRODUCTION

It is necessary to have high reproductive efficiency for successful dairy proceeds [13]. Several parameters such as milk production, reproductive management practices and reproductive diseases have been shown to affect reproductive efficacy. Endometritis is one of the most common uterine disorders in dairy cows, causing decreased fertility and high economic losses. The most common pathogens that cause endometritis are *Trueperella pyogenes, Escherichia coli, Fusobacterium necrophorum and Prevotella spp* but *Trueperella pyogenes* is the most important [20]. Disrupting several factors such as balance between microbes, host immunity, and other environmental or animal factors may lead to endometritis [21]. For short period of time after parturition, there is a cycle of bacterial contamination but in many animals, this bacterial contamination is gradually resolved by several mechanisms such as uterine involution, passage of lochia out of the uterus and immune defenses. However, failure to resolve the contamination can cause clinical endometritis for at least 3 weeks after parturition [21] and it causes delay in the start of ovarian activity and increases in time to first service of around 30 days even when the cow is treated [5].

Different treatment protocols have been used to treat clinical endometritis such as intrauterine (IU) application of penicillin, tetracycline, cephapirin and systemic administration of ceftiofur or administration of prostaglandin F2α (PGF2α) [17, 19, 7, 4, 11, 18].

Cephapirin is the first generation of cephalosporin that has a wide spectrum of activity against gram-positive and gram-negative organisms [1]. It is resistant to the action of penicillinase and active in non-aerobic environments

such as encountered in an infected uterus. Furthermore, the suspension was well tolerated, enables good diffusion into the endometrium and easily infused. On the other hand, oxitetracycline bwlongs to the group of medicine called tetracycline antibiotics. Some attribute of this antibiotic such as effectiveness of that against a wide variety of bacteria, well absorption, low toxicity and low price led to the wide use of tetracycline antibiotics in the treatment of human and animal bacterial infections [16, 6], but some strains of bacteria have developed resistance to this antibiotic, which has reduced its effectiveness for treating some types of infection [23, 24].

Numerous methods have been used in the treatment of endometritis, in the most of them, animals inseminated in the next estrus; it causes increase in calving to conception interval and calving to first service interval and high economic loss. Therefore, recently some studies administrate intrauterine antibiotics after insemination to solve this problem [14].

Morula enter to the uterus 4 to 5 days after insemination [2] and it is assumed that, at this time antibiotics remove the pathogens and consequently the uterus cleaned for attachment.

The aim of this study was to investigate the effect of intrauterine cephapirin and oxytetracyclin injection 24 hours after artificial insemination (AI) on conception rate in cows with endometritis.

MATERIALS AND METHODS

Study Animals

The present study was conducted between May 2010 and February 2011 on commercial dairy farm in east Azarbaiejan Iran. Herd size was 700 cows in the period of experimental time. Animals were housed in free-stall facilities with cubicles. Calving pens were straw_bedded. In this farm, all cows were fed a total mixed ration based on maize silage, grass silage and concentrates. Artificial insemination had been used in this farm after a voluntary waiting period of approximately 60 days postpartum.

Study design

The farm owner and the veterinarian of the farm were informed about all relevant characteristics of the study and agreed with the study design. Artificial insemination technicians were involved in the study; however, they were not informed about the treatment groups. Cows were examined for the presence of abnormal uterine discharge (grade 1) externally on the tail, perineum and vulva or extract abnormal discharge at rectal palpation and then examined the entire reproductive tract by using transrectal ultrasonography (BCF). Increased size in uterine were identified and three separate cross-sectional images were used to determine mean endometrial thickness and mean uterine luminal diameter. The luminal fluid was measured by ultrasound examination in the greatest area of the fluid accumulation. Animals were systematically allocated to the one of three groups according to their ear tag numbers. Finally 150 Holstein dairy cows were selected that were affected by postpartum endometritis. Fifty of these cows were randomly assigned to receive 500 mg cephapirin in 19.6 g ointment base IU (METRIKIM-IRAN) 24 hours after insemination and another 50 cows received cephapirin (IU) and inseminated in the next estrus, while the remaining 50 cows received 2 mg of oxytetracycline 5% (IU) (ERFAMYCIN-IRAN) 24 hours after insemination. Pregnancy was diagnosed using ultrasonography between 30 and 35 days post insemination.

Statistical analysis:

Parameters were expressed as percent. The differences between treatment groups were calculated by Independent chi-square. The *calais vl* calis test was used to compare the conception rate between the three groups. The P-values of less than 0.05 were considered statistically significant.

RESULTS

Table 1 describes the effect of oxytetracycline and cephapirin on relative pregnancy rate in all cows. As shown, the conception rate of cows received cephapirin and oxytetracycline 24 hours after insemination was 32% and 22% respectively and 28% in the cows received cephapirin and inseminated in the next estrus.

Table1: Effect of oxytetracycline and cephapirin on relative pregnancy rate in cows.

group	Pregnant		Non pregnant		Total	
	N	%	N	%	N	%
Cephapirin after insemination	16	32%	34	68%	50	100%
insemination after cephapirin	14	28%	36	72%	50	100%
oxytetracyclin after insemination	11	22%	39	78%	50	100%

DISCUSSION

Because of the importance of endometritis on pregnancy rate, there has become an increased awareness of the need to treat endometritis in recent years [12, 22, 3, 19, 4]. Different drugs like penicillin, ceftiofur, oxytetracycline and especially cephapirin have been used to treat endometritis, but the results on the effect of antibiotic treatment on reproductive performance were inconsistent [17, 7, 18].

A variety of antibiotics have been infused into the uterus of cows in attempts to treat postpartum infections. Some authors have found intrauterine treatment to be beneficial, while others have found it to have no effect on clinical and subclinical endometritis [10, 17]. Leblanc et al. (2002) reported that treatment of cows with specifically diagnosed clinical endometritis after 4 weeks postpartum with 500 mg cephapirin IU resulted in a significantly shorter time to pregnancy than in untreated cows [19] and Kasimanickam et al. (2005) demonstrated that a single treatment with cephapirin had significantly improved the reproductive performance of cows with subclinical endometritis [17]. However there is no evidence of improved reproductive performance among cows with endometritis treated with IU penicillin or tetracycline, relative to treatment with PGF or to no treatment (8, 9, 18).

Although administration of intrauterine antibiotic after insemination is current in the field, only a few manuscripts have evaluated the effect of that on clinical and subclinical endometritis [1, 15, 25, 14].

Gupta et al, (1983) administrated post-insemination intrauterine infusion of Streptopenicillin, Lugol's solution, one and two vials of Mastalone-U and distilled water. These treatments were compared on the basis of conception rate with that of control in repeat breeder cows. He demonstrated that there was no significant difference between the treated groups and the control, in that study, the conception rate was significantly low except that with two vials of Mastalone-U, it was in consistent with Gumen et al. (2012) who concluded that cephapirin administration did not enhance conception rate in repeat breeder cows [1]. Sahms-Esfandabadi et al. (2004) adminestreated penicillin and oxytetracycline 24 hours post insemination in cows with clinical endometritis and compared it with non-treated animals. They concluded that there was no advantage relative to the control on the first service conception rate [14]. Other than we administrated cephapirin and oxytetracyclin 24 hours after insemination and compared it with animals that received cephapirin at the first estrus and inseminated on the fallowing estrus. We concluded that there is no significant difference between administrate cephapirin and oxytetracyclin 24 hours after insemination and insemination in the next estrus in cows with clinical endometritis.

CONCLUSION

There were no significant differences between administration of antibiotic 24 hours after insemination and insemination in the next estrus in cows with endometritis but it causes decreasing in calving to conception interval and calving to the first service interval.

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