

**EFFECT OF ANTIBIOTIC TREATMENT ON PREGNANCY
RATE IN REPEAT BREEDER GIR COWS**

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ABSTRACT

The study was aimed to evaluate the effect of intrauterine and parenteral antibiotic treatment on conception rate in repeat breeder Gir cows. In all 36 pluriparous Gir cows (24 repeat breeders not conceived even after 3-5 regular quality AIs, and 12 normal cyclic postpartum cows) were assigned into three groups. Repeat breeder cows were treated once with either Gentamicin (100 mg) intrauterine (10 ml diluted with 10 ml distilled water) 1 hour before insemination (Group I; n = 12) or with Ceftiofur (Bovicef, 1 g) intramuscularly @ 2.2 mg/kg body weight at the time of insemination (Group II; n = 12), while normal cyclic cows served as untreated (non-repeat breeder) Controls (Group III: n = 12). The cows in oestrus were inseminated with good quality frozen-thawed semen at least for two cycles post-treatment if not settled. Conception rates were better with Gentamicin at first and second service in repeat breeders. The overall pregnancy rates after three services among three groups (83, 67 and 58 %, respectively) also differed significantly ($P < 0.05$). In conclusion, the pregnancy rates could be improved by treatment with Gentamicin and Ceftiofur in repeat breeder Gir cows.

KEY WORDS : Gir cows, Repeat breeder, Antibiotic therapy, Pregnancy rate.

INTRODUCTION

Reproductive performance is a key component of dairy production management. High reproductive efficiency is necessary for a successful dairy operation and requires a calving interval that maximizes milk production within the herd (Plazier *et al.*, 1997; Ferguson and Galligan, 2000). Good oestrus detection, good insemination technique, quality semen and a healthy uterine environment are critical components of high reproductive efficiency (Nebel, 1999). Repeat breeding is a substantial problem in cattle breeding leading to large economic loss for the dairy producer due to more inseminations, increased calving interval and increased culling rates (Simenew *et al.*, 2011). Potential causes of repeat breeding include sub-clinical infection of reproductive tract, age of the animal (Bartlett *et al.*, 1986), errors in detection of oestrus (DeKriuf, 1978), endocrine dysfunction (Gustafsson *et al.*, 1986), nutritional deficiencies and others. The intrauterine infusions in repeat breeders have proven to be successful (Oxender and Seguin, 1976). Different treatment regimes including intrauterine or parenteral antibiotics have been used to treat postpartum uterine disease (McDougall, 2001). Gentamicin appeared to be a rational antibiotic choice for iu infusion and Ceftiofur, a third-generation cephalosporin, is active against a wide range of Gram-positive and Gram-negative organisms. The objective of the present study was to evaluate the effect of a single iu infusion of Gentamicin or im administration of Ceftiofur on the reproductive performance of repeat breeder cows.

MATERIALS AND METHODS

The present study was conducted on 36 Gir cows selected from the herd maintained at the Cattle Breeding Farm, JAU, Junagadh. Of these, 24 cows had the history of repeat breeding (availed 3-5 services but failed to conceive), whereas other 12 normal cyclic cows served as control. The cows had moderate body condition with body weight ranging from 350 to 450 kg and were of 2 to 6 parity with the average milk production of 2500 to 3000 liters per lactation. Throughout the study

period, the cows were maintained under similar feeding and management practices in a semi-covered shed.

All these cows were palpated per rectum to make sure that they were not pregnant and genitalia were normal. Cows were assigned into three groups. Twelve repeat breeding cows were treated with Gentamicin (100 mg) intrauterine (10 ml diluted with 10 ml distilled water) 1 hour before insemination (Pre-AI treatment, Group-I). Another twelve repeat breeding cows were treated with Ceftiofur sodium (Bovicef, 1 g) intramuscularly (@ 2.2 mg/kg body weight) at the time of insemination (Group-II), while 12 normal cycling postpartum cows did not receive any treatment and served as control (Group-III).

Cows in oestrus were inseminated approximately 12 h after the standing heat using frozen thawed semen by a single technician. The cows which returned to oestrus were again inseminated (second or third service) and in non-return cases, pregnancy diagnosis was performed 60 days after the last insemination.

The differences in conception rates among cows of three groups were compared for the first, second, third service and overall pregnancy rate using Pearson χ^2 -test (SPSS version 10.0). The difference between two proportions (each of two groups) was compared using Z-test (PH Stat 2, Microsoft Excel 2002).

RESULTS AND DISCUSSION

The conception rates in repeat breeder Gir cows are presented in Table 1. The conception rates of first and second service for Gentamicin treated cows (42% and 33%) did not differ significantly ($P < 0.01$) from Ceftiofur treated (33% and 25%) and Control cows (25% and 17%). Conception rates for third service among three groups tended to be different ($P < 0.01$). The conception rate of third service for control cows (17%) was greater than that of Gentamicin and Ceftiofur treated cows. The overall pregnancy rates among three groups also differed significantly ($P < 0.01$). The overall pregnancy rate of Gentamicin treated cows (83%) was higher than that of Ceftiofur treated and Control cows. The overall average pregnancy rate of both the treated repeat breeders groups was 75% as against 58% in non-repeat breeder control group.

Table 1. Conception rates of repeat breeder Gir cows following antibiotic treatment

Reproductive Status	Treatment Group	No. of Cows	Pregnancy rates (%)			
			First Service	Second Service	Third Service	Overall
Repeat Breeders	Gentamicin (100 mg, i/ut)	12	(5/12) 42 ^a	(4/12) 33 ^a	(1/12) 8 ^a	(10/12) 83 ^a
	Ceftiofur (1 g, i/m)	12	(4/12) 33 ^a	(3/12) 25 ^a	(1/12) 8 ^a	(8/12) 67 ^{ab}
Normal Cyclic	Untreated Control	12	(3/12) 25 ^a	(2/12) 17 ^a	(2/12) 17 ^b	(7/12) 58 ^b

Values within the column with different superscripts differ significantly ($P < 0.01$).

LeBlanc *et al.* (2002) administered Cephapirin benzathine by intrauterine route, and obtained improved fertility ($P < 0.05$) over controls in endometritic cows. On the other hand, Gentamicin

sulphate administered by intrauterine infusion @ 200 mg, 10 minutes following insemination in dairy cows did not enhance fertility (Daniels *et al.*, 1976). In the present study, overall higher pregnancy rates in Gentamicin treated compared to Ceftiofur treated cows might be due to difference in the pharmacokinetic characteristics of two antibiotics. Gentamicin when administered intrauterine attained maximum plasma concentration within 30 minutes (Al- Guedawy *et al.*, 1983). Bademkiran *et al.* (2009) stated that cows with endometritis treated with Ceftiofur 1 mg/kg intramuscularly on three consecutive days gave 40% first service conception rate and 80% cows became pregnant within 250 days in milk (DIM). On the contrary, Gulvao *et al.* (2009) did not find any beneficial effect of intrauterine infusion of Ceftiofur hydrochloride on uterine health and fertility in dairy cows.

In conclusion, the overall pregnancy rates in repeat breeder Gir cows were improved by the treatment of antibiotics Gentamicin and Ceftiofur, and the results even excelled the values in normal healthy/cyclic control group, proving that these antibiotics are still the treatment of choice for repeat breeder dairy cows.

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