

THERAPEUTIC EFFICACY OF VARIOUS INTRAUTERINE DRUGS ON REPEAT BREEDER GIR COWS

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Abstract: The study was planned to investigate the effect of intrauterine antibiotic treatment on conception rate in repeat breeder Gir cows. In all 48 pluriparous Gir cows (36 repeat breeders not conceived even after 3-5 regular quality AIs, and 12 normal cyclic postpartum cows) were assigned into four groups. Repeat breeder cows were treated with either Gentamicin (100 mg) intrauterine (10 ml diluted with 10 ml distilled water) (Group I; n = 12), Enrofloxacin (Enrogyl, 35mg) (Group II; n = 12) or with Cephalexin (Lixen, 4g) (Group III; n = 12) intrauterine while normal cyclic cows served as untreated (non-repeat breeder) Controls (Group IV; n = 12). The cows in oestrus were inseminated with good quality frozen-thawed semen by a single technician at least for three cycles post-treatment if not settled. The pregnancy diagnosis was performed at 60 days post insemination in non-return cases. Conception rates were better with Cephalexin at first, second and third services in repeat breeders. The overall pregnancy rates after three services among four groups were 67, 75, 83 & 58%, respectively in Group I, II, III and IV. In conclusion, the pregnancy rates could be improved by treatment with Cephalexin, Enrofloxacin and Gentamicin in repeat breeder Gir cows.

Keywords: Gir cows, Repeat breeder, Antibiotic therapy, Pregnancy rate.

Introduction

Reproductive performance in dairy cows is a key factor affecting profitability of the dairy industry (Galvao *et al.*, 2013). The repeat breeding cow is one that has clinically normal reproductive tract with normal or nearly normal oestrous cycles and oestrus periods and has been bred two or more times to a fertile bull but failed to conceive (Roberts, 2004). Repeat breeding is one of the most important causes of infertility in cattle that results in delayed conception, increased calving interval, loss of milk production, reduction in calf crop, increased cost of treatment and culling of useful breeding animals leading to heavy economic losses to dairy producers (Lafi and Kaneene, 1992). The incidence of repeat breeding has been reported to be 5-32% in cows (Gupta and Deopurkar, 2005). Potential causes of the

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repeat breeding mainly include nutritional deficiency, age of the dam, improper estrous detection, endocrine dysfunction and subclinical uterine infection (Ahmed and Elsheikh, 2014; Singh *et al.*, 2015). For the repeat breeder cows suspected to have an infectious etiology, many of the treatments used have been in the form of uterine infusions with a variety of antiseptic and antibiotic solutions. The intrauterine (IU) infusions in repeat breeders have proven to be successful (Oxender and Seguin, 1976).

The concentration of the drug at adequate level is essential in every part of the genital tract for the effective treatment of genital tract infection. Different treatment regimes including intrauterine antibiotics have been used to treat postpartum uterine disease (McDougall, 2001). Gentamicin appeared to be a rational antibiotic choice for IU infusion and Enrofloxacin, one of the fluoroquinolones, is active against Gram-positive and Gram-negative organisms (Richez *et al.*, 1994). Cephalexin is a broad-spectrum cephalosporin antibiotic, it also effective against most gram-positive and gram-negative bacteria. The objective of the present study was to evaluate the effect of a single IU infusion of Gentamicin, Enrofloxacin and Cephalexin antibiotics on the reproductive performance of repeat breeder cows.

Materials and Methods

The present study was conducted on 48 Gir cows selected from the herd maintained at the Cattle Breeding Farm, JAU, Junagadh. Of these, 36 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 2nd to 6th 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 under loose housing system.

All these cows were palpated per rectum to make sure that they were not pregnant and genitalia were normal. Cows were assigned into four groups. Group-I, animals were treated intrauterine with Gentamicin (100 mg; 10 ml diluted with 10 ml distilled water; Gentid). Group-II, animals were treated intrauterine with Enrofloxacin (35 mg; 45ml; G. Loucatos & Co.). Group-III, animals were administered intrauterine with cephalexin @ 4 gm diluted with 60ml distilled water (Lixen I.U; Virbac). While, the remaining twelve normal cycling postpartum cows did not receive any treatment and served as control (Group-IV). The repeat breeder cows were inseminated in next heat using frozen thawed semen by a single technician. The cows which returned to estrus were again inseminated (second or third

service) and in non-return cases, pregnancy diagnosis was performed 60 days after the last insemination.

Results and Discussions

The conception rates in repeat breeder Gir cows are presented in Table-I. In Group I, out of 12 animals, 5 (42%) conceived at first service, 2 (29%) conceived at second service and 1 out of 5 conceived at third service. Similarly, first service conception rate in Group II, III and IV were recorded as 50%, 42% and 25%, respectively. The first service conception rate was higher in group II animals (50%) treated with enrofloxacin. The overall conception rates in the present study were recorded as 67%, 75%, 83% and 58% for Group I, II, III and IV, respectively. In the present study, out of 36 repeat breeder cows a total of 27 conceived. The overall pregnancy rate of cephalixin treated cows (83%) was higher than that of gentamicin and enrofloxacin treated cows (67% & 75%). Similar results, 76.92% and 60% were reported by Singh *et al.* (2014) and Resum and Singh (2016) in crossbred cows treated with cephalixin. Cephalixin is 1st generation cephalosporin act by inhibiting synthesis of the peptidoglycan layer of the bacterial cell wall (Fisher *et al.*, 2005) also remains a choice for intrauterine infusion with activity against gram positive as well as gram negative bacteria. Intrauterine administration of cephalixin improved the conception rate in the present study due to its bactericidal effect thus eliminating uterine infection.

Table: I- Conception rates of repeat breeder cows following antibiotic treatment

Reproductive Status	Treatment Group	No. of Cows	Pregnancy rates (%)			
			First Service	Second Service	Third Service	Overall
Repeat Breeders (Gir cows)	Gentamicin (100 mg, i/ut) (Group-I)	12	(5/12) 42	(2/7) 29	(1/5) 20	(8/12) 67
	Enrofloxacin (35 mg, i/ ut) (Group-II)	12	(6/12) 50	(2/6) 33	(1/4) 25	(9/12) 75
	Cephalixin (4 g Cephalixin, i/ut) (Group-III)	12	(5/12) 42	(3/7) 43	(2/4) 50	(10/12) 83
Normal Cyclic (Gir cows)	Untreated Control (Group-IV)	12	(3/12) 25	(2/9) 22	(2/7) 29	(7/12) 58

In group-II, the overall conception rate was 75%. On contrary to the present study, Resum and Singh (2016), Warriach *et al.* (2008) and Singh *et al.* (2015) reported 40%, 33% and 50% conception rate in crossbred cows, respectively. The higher conception rate indicates the

effectiveness of antibiotics against the gram-positive and gram-negative bacteria. The conception rate was similar in both group-I and II (75% & 67%). The results are contrary to Warrich *et al.* (2008) who reported pregnancy rate of Gentamicin was significantly higher compared to Enrofloxacin in repeat breeder dairy crossbred cows (80% vs. 33%). 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). Gentamicin when administered intrauterine attained maximum plasma concentration within 30 minutes (Al-Guedawy *et al.*, 1983).

Summary

The overall pregnancy rates in repeat breeder Gir cows were improved by the treatment of antibiotics like Gentamicin, Enrofloxacin and Cephalexin. The present study proved the success of intrauterine infusions in treating repeat breeders.

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