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EMPLOYING THE EFFECT OF GENTAMYCIN AND ENROFLOXACIN TREATMENT ON PREGNANCY RATE OF REPEAT BREEDER DAIRY CROSS BRED COWS

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ABSTRACT

The experiment was to investigate the effect of gentamycin and enrofloxacin treatment on pregnancy rate in repeat breeder dairy crossbred cows. Based upon culture and sensitivity test, cows were assigned into two groups. Genta (n = 8) cows were treated with gentamycin (100 mg/ml) and ENRO (n = 10) cows were treated with enrofloxacin (100 mg/ml) intramuscularly 4 ml/100 kg body weight and intra-uterine 2-8 ml diluted with 20 ml of physiological salt solution with 24 hours interval for seven days in both groups (four infusions per animal on every other day basis). Control (n = 12) cows were untreated control (non-repeat breeder). After treatment, cows were inseminated approximately 12 h after the standing heat. Pregnancy diagnosis was performed by per rectal examination between days 80 and 90 post insemination. The overall pregnancy rates after three services among three groups were significantly different ($P<0.05$). The overall pregnancy rates after three services of Genta cows (87.5%) did not differ significantly ($P>0.05$) from Control cows (91.7%). However, overall pregnancy rates of Enro cows (50%) were significantly lower ($P<0.05$) than Genta and Control cows. In conclusion, the pregnancy rates could be improved by treatment with gentamycin compared to enrofloxacin in repeat breeder dairy crossbred cows with sub-clinical uterine infection.

KEYWORDS: Repeat breeder, enrofloxacin, crossbred cows, gentamycin, and pregnancy rate.

INTRODUCTION

Repeat breeding is one of the most frustrating reproductive problems in field condition. 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, 1971). The incidence of repeat breeding has 5-32% in cows 6-30% in buffaloes (Gupta *et al.*, 2005). It causes of repeat breeding include sub-clinical infection of reproductive tract (Rao, 1982), 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 (Francos *et al.*, 1977). They are more prone to parasitic infestation (Afzal *et al.*, 1986). Similarly, pure or crossbred cows maintained in subtropical environment have more reproductive disorders. In Pakistan, very high incidence (47.5%) of repeat breeding due to uterine infections has been reported in crossbred dairy cows (Kakar *et al.*, 1997). This could be due to the natural service by infected bull, as a sequel of post-partum prolapse, retained fetal membranes, dystokia, abortion, handling of prolonged parturition by the unskilled person, inappropriate insemination and/or improper sterilization of insemination equipment, inflation of air and insertion of tail into vagina and other unexplained reasons. The objective of the present study was to determine the effect of selective treatment of either gentamicin or enrofloxacin on pregnancy rate in repeat breeder dairy crossbred cows.

MATERIAL AND METHODS

The present study was conducted on 30 Dairy crossbred cows maintained at the different villages of block Jasra Allahabad India. Of these, 18 cows had the history of repeat breeding (availed six to eight services but failed to conceive), whereas other 12 were control. The cows had moderate body condition with body weight ranged from 380 to 470 kg. Parity was from 2 to 6 and the average milk production ranged from 2000 to 2500 liters per lactation. Throughout the experimental period, the cows were maintained as a group and were housed in semi covered sheds under similar conditions of feeding and management. Each day, cows were fed 10-20 kg of green fodder, 2-5 kg dry fodder and 1-2 kg of concentrate mixture containing 15% crude protein and 65% total digestible nutrients. All the experimental cows were palpated per rectum to make sure that the cows were not pregnant and genitalia were normal. Uterine swabs were collected from the cows having the history of repeat breeding (n = 18) for culture and antibiotic sensitivity test under sterile conditions. The antibiotics used in the test were gentamycin, kanamycin, oxytetracycline, penicillin, chloramphenicol,

norfloxacin and enrofloxacin. Cows were assigned into two groups. Genta (n = 8) cows were treated with gentamycin (100 mg/ml; Farvet, Italy) intramuscularly at the dose of 4 ml/100 kg body weight and intra-uterine 2-4 ml diluted with 16 ml of physiological saline solution. Enro (n = 10) cows were treated with enrofloxacin (100 mg/ml; Vetycare,) intramuscularly at the dose of 4 ml/100 kg body weight and 2-8 ml diluted with 20 ml of physiological salt solution with 24 hours interval for seven days in both groups (four infusions per animal on every other day basis). Control (n = 12) cows did not receive any treatment and served as control (non-repeat breeder). After the end of antibiotic therapy, both the groups were given sexual rest of at least one month. At the end of sexual rest, cows were synchronized with two injections of 0.150 mg/2 ml of PGF2α i.m; 12 h apart after the detection of corpus luteum by palpated per rectal. Cows were observed for oestrus, two times a day using a teaser bull. Cows in estrus were inseminated approximately 12 h after the standing heat using frozen thawed semen. The cows were inseminated by a single technician. Pregnancy diagnosis was performed by palpated per rectal between days 80 and 90 post insemination. The cows which returned to estrus were again inseminated (second service), and checked for pregnancy. Similarly cows that returned to estrus twice were inseminated (third service) and checked for pregnancy accordingly. The differences in pregnancy rates among cows of three groups were compared for the first, second, third service and overall pregnancy rate using Pearson $\chi 2$-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

In the present study pregnancy rate in repeat breeder dairy crossbred cow are presented in table 1. In 1st service the pregnancy rates among the three groups tended to be different ($P< 0.05$). 1st service the pregnancy rates of Genta cow did not differ significant with control cow. However, 1st service pregnancy rates for Enrow cow were lower significantly than control and Genta cow. In 2nd service the pregnancy rate of control groups lower than Enro and Genta cows but did not differ significantly. In third service the pregnancy rate of repeat breeder Enro cow lower than control and Genta cow but did not differ significantly.

Table 1. Effect of gentamycin and enrofloxacin treatment on pregnancy rate of repeat breeder dairy crossbred cows.

Groups	No. of cow	Pregnancy rates (%)			
		1st service	2nd service	3rd service	Over all
Genta	8	(3/8) 37.5[a]	(3/8) 37.5	(1/8) 12.5	(7/8) 87.5[a]
Enro	10	(1/10) 10[b]	(3/10) 30	(1/10) 10	(5/10) 50[b]
Control	12	(5/12) 41.7[a]	(3/12) 25	(3/12) 25	(11/12) 91.7[a]

The over all pregnancy rate of repeat breeder Genta cow did not differ significantly with control cow. However overall pregnancy rates of Enro cow significantly lower than Genta and control cow. The over all pregnancy rate of both the treated groups 66 per cent. 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, gentamycin sulphate administered by intrauterine infusion at the rate of 200 mg, 10 minutes following first service insemination in dairy cows did not enhance fertility (Daniels *et al.*, 1976). In the present study, higher overall pregnancy rates in Genta compared to Enro cows might be due to differences in the pharmacokinetic characteristics of two antibiotics. For example, half-life (t½) and bioavailability have been reported to be higher in gentamycin and were 45 hours and 92% (Haddad *et al.*, 1987) versus 6 hours and 82% respectively for enrofloxacin (Kaartinen *et al.*, 1995). Gentamycin when administered intrauterine attained maximum plasma concentration within 30 minutes (al- Guedawy *et al.*, 1983). These findings indicate that physiochemical characteristics of gentamycin are better compared to enrofloxacin in these repeat breeder cows. In conclusion, overall pregnancy rates in repeat breeder dairy crossbred cows with sub-clinical uterine infection were improved by the treatment of antibiotics along with sexual rest up to 66% after three services. Furthermore, pregnancy rate of gentamycin was significantly higher compared to enrofloxacin in repeat breeder dairy crossbred cows.

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