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Effect of Ciprofloxacin on Recovery and Conception Rate in infectious Repeat Breeder Crossbred Cows

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Abstract

The present study was undertaken to evaluate the therapeutic efficacy of Ciprofloxacinin in 20 infectious repeat breeder crossbred cows brought to the AI centre of Department of Veterinary Gynaecology and Obstetrics, College of Veterinary Science and Animal Husbandry, Mhow and nearby Government AI centers. Animals were divided into two groups ten in each .The animals in first group were treated with Ciprofloxacin Hydrochloride @ 4 mg/kg BW IU. The animals in control group were infused with 30 ml saline IU. Bacterial count, total Cellular count and PMNs values were reduced highly significantly ($P < 0.01$) in Ciprofloxacin treated group than in control group. 90.00 % cows under Ciprofloxacin treatment became negative to White side test. An overall conception rate of 70.00 per cent was found in Ciprofloxacin treated repeat breeder cross bred cows.

Introduction

Repeat breeding alone is a major cause of infertility and economic loss to dairy farming. Reproductive tract infections, has been attributed to be one of the most important factors. The incidence of repeat breeding had been reported to vary from 7.31 to 23.88 per cent among bovines (Singh, 1991). Prasad (2006) recorded higher bacterial load prior to treatment per ml of cervical mucus in cases of endometritis. The most common method of treatment is both intrauterine (Galvao et al., 2009 and Galvao, 2011) or systemic (Chenault et al., 2004) antibiotic administration. The present study was carried out to evaluate the efficacy of ciprofloxacin l/U infusion in repeat breeder cross bred cows.

Materials and Methods

The study was conducted on clinical cases of cross bred cows belonging to farmers brought to the Artificial Insemination (AI) centre of

Department of Veterinary Gynaecology and Obstetrics, College of Veterinary Science and Animal Husbandry, Mhow (India) and nearby Government AI centers during period from December, 2015 to April, 2017. All the cows (>90 days postpartum) were screened as per history, gynecological examination, nature of estrual cervico-vaginal mucus and positive to white side test (WST) by the method of Popov (1969) to categorize them as infectious repeat breeding crossbred cows. These crossbred cows were classified as repeat breeders based on cycling normally without any apparent genital anomaly and repeated estrus even after three or more consecutive services. The infectious repeat breeder cows thus identified were divided into two groups with ten animals in each, T1 group was treatment group and T2 was kept as negative control. T1 group animals were treated with ciprofloxacin Hydrochloride @ 4 mg/kg bw dissolved in saline to make 30 ml, Intra uterine (IU) at 24 hrs interval, for 7 days whereas control group animals were infused with 30 ml saline IU, at 24 hrs interval, for 7 days. The estrual cervico-vaginal mucus in cows was examined for pH before and after treatment at subsequent estrus using pH paper strips. All animals were flushed at 8 -12 hours after they showed first signs of heat and on 24 hours later to last administration of the therapeutic agent. The collection technique involved aspiration of uterine flushing by a two-way Foley catheter as described by Sudarshan Kumar *et al*. (2015). Total Bacterial Count in uterine flushing was done as per Bauer *et al.* (1966). The total Cellular count in the uterine flushing was determined by hemocytometeric technique using neubauer chamber as per standard procedure (Jain,1986). Poly-morphonuclear (PMN%) count in the uterine flushing was made in smears prepared from the cell suspension received by centrifugation (3000 r.p.m. for five minutes), on clean grease free glass slides, air dried and fixed with methanol for 5 minutes and stained with Giemsa stain, 200 cells were counted under oil immersion lens(1000 X magnification) and percentage of PMNs was calculated (Kasimanickam *et al*., 2004). Statistical analysis was carried out by using Completely Randomized Design as per Snedecore and Cochran (1980) .

Results and Discussion

The observation on the nature of the CVM revealed that during infection purulent discharge was observed in 50% cows and Muco purulent discharge in 40 % cows whereas the CVM of 10 % cows was clear. In the present study, following intrauterine infusion of Ciprofloxacin, the discharge was clear in all the cows at subsequent estrus.

Table: Effect of Ciprofloxacin on CVM, pH, Bacterial count, Total cellular count and PMN (%) in infectious Repeat Breeder Crossbred Cows.

Parameters/Observations		Ciprofloxacin (n = 10)		Control (n = 10)	
		Pre-treatment estrus	Post –treatment estrus	Pre-treatment estrus	Post-treatment estrus
CVM appearance	Purulent	50.00 (5)	0.00	60.00 (6)	50.00 (5)
	Muco-Purulent	40.00 (4)	0.00	40.00 (4)	40.00 (4)
	Clear	10.00 (1)	100.00	0.00	10.00 (1)
CVM –pH (Mean ± SE)		8.16 ± 0.01^{A}	7.44 ± 0.01^{B}	8.36± 0.02	8.31 ±0.02
Bacterial Count 10^4/ml		311.74 ± 3.39^{A}	0.89 ± 0.04^{B}	328.62±0.17	296.96±0.22
Total Cellular count (TCC)		0.621 ± 0.01^{A}	0.194 ± 0.01^{B}	0.433 ± 0.02^{A}	0.581 ± 0.01^{B}
PMNs %		26.50 ± 0.11^{A}	18.17 ± 0.21^{B}	27.84±0.12	25.57±0.27

Results of the present study (Table) shows that at subsequent estrus following treatment, pH significantly declined (P< 0.05) in Ciprofloxacin group but not in untreated control group cows. The declined pH of cervical mucus in the treatment group is corroborated with earlier observations following treatment of repeat breeder cows with Ciprofloxacin therapy (Singh, 2016).

In the present study, the higher values of pH in repeat breeder cows are in close proximity to the values reported earlier (Deori *et al.,* 2004; Modi *et al*., 2011 and Sudarshan Kumar *et al*., 2015). In repeat breeding cows with endometritis due to infection, the metabolites of bacteria and inflammatory exudates may alter the pH of estrual cervical mucus to alkaline side resulting in failure of conception due to death of spermatozoa (Ravikumar *et al.,* 2007). Once the infection is eliminated, the pH of cervical mucus returns towards the neutral side.

White side test was performed on the estrual cervico-vaginal mucus of control and treated animals, before and after treatment. Most of the cows became negative to White side test following treatment with Ciprofloxacin (90.00%) as compared to only 10.00 % cows in control group. It indicates that Ciprofloxacin is an effective treatment for endometritis. The present findings are corroborated with Singh (2016).

A significant decline (P < 0.05) in bacterial count (x10^4/ml) was observed from pre-treatment to post-treatment estrus in uterine flushing of Ciprofloxacin group (311.74 ±3.39 to 0.89 ± 0.04) as compared to control group (328.62 ± 0.17 to 296.96 ± 0.22). Xiang (2009) and Singh (2016) reported significant drop in bacterial load in uterine flushings following treatment with Ciprofloxacin. Reduction in bacterial load in control group may be due to natural uterine defense mechanisms. The non-significant increase in cellular count in control group might be due to natural uterine defense mechanism. A significant decline (p<.01) in the total cellular count (10^6/ml) and (PMNs) % values was observed from pre-treatment and post- treatment in uterine flushing of Ciprofloxacin group (0.621± 0.01 to 0.194 ± 0.01) and (26.50 ± 0.11 to 18.17 ± 0.21), respectively.

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Conflict of Interest:

All authors declare no conflict of interest.

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