



SHORT COMMUNICATION

Therapeutic Efficacy of Levofloxacin along with Vitamin E for the Management of Repeat Breeding Syndrome in Cow under Field Condition

Manoj Kumar*, Shiv Saran Pant, Ramsharan Ram, Salendra Kumar and PK Gupta

Department of Animal Husbandry, Saharsa-852201 (Bihar) India

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ABSTRACT

In present study, thirty four cross breed cow with history of Normal cycle without any clinical abnormalities and returned to heat after three or more consecutive services was included and divided in to two group A & B. Group A was treated with ciprofloxacin where as Group B was treated with levofloxacin along with alpha tocopherol (vitamin E). All recovered animal was artificially inseminated at next estrus. Recovery and conception rate (CR) was recorded as 87.50% and 62.50% for Ciprofloxacin combination treated group and 83.34% and 77.78% for levofloxacin combination treated group respectively. Finally, it is concluded that Levofloxacin, combination is more effective to control incidence of repeat breeding caused due to uterine infection in field condition.

*Corresponding Author

Manoj Kumar

manojvet332@gmail.com

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INTRODUCTION

Repeat breeder syndrome (RBS) is a major economic loss in the dairy industry due to greater insemination costs and increased calving interval. Repeat breeder animals exhibit normal cycle without any clinical abnormalities, but fail to conceive even after at least three successive artificial inseminations. RBS is a multifactorial disease like subclinical endometritis is a major contributor to the repeat breeder syndrome of bovines (Noakes *et al.*, 2001). Sub clinical endometritis causes an abnormal uterine environment and disrupted embryo survival. Therefore, an improvement of the intrauterine environment to enhance embryo survival represents a different therapeutic method for repeat breeding. Aerobic as well as anaerobic infection needs to be considered before selecting antibiotics for treatment of endometritis and hence combination therapies are necessary to combat both type of infections. Fluoroquinolones are the most efficacious antibacterial include enrofloxacin, norfloxacin, ciprofloxacin, orbifloxacin, ofloxacin, danofloxacin, flumequine, difloxacin, marbofloxacin and other newer drugs. The quinolones inhibit the bacterial enzyme DNA-gyrase (topoisomerase), which is responsible for the supercoiling of DNA so that the DNA can twist in a number of chromosomal domains and seal around an RNA core. The

quinolones are usually bactericidal therefore, susceptible organisms lose viability within 20 min of exposure to optimal concentrations of the newer fluoroquinolones. Newer quinolones also have significant activity against *Mycoplasma* and *Chlamydia spp.* Levofloxacin, a third generation fluoroquinolones has tremendous potential of use for the treatment of uterine infections because of its broad spectrum of coverage over aerobes and anerobes. Addition of anti-protozoal with fluoroquinolones increases efficacy of therapy. Vitamin E (Alpha Tocopherol) appears to enhance host defenses against infections by improving phagocytic cell function and fertility. Uterine endometrial treatment with alpha tocopherol might have improves oxygen utilization, health of superficial layer of endometrium and provide assistance for metabolism as a cellular antioxidant for effective innate defense that may enhances fertility. In view of the above, the present study was designed to ascertain the beneficial effects of combination of intra uterine antibacterial Levofloxacin and Ornidazole along with alpha tocopherol for the treatment of repeat breeder cows of infectious origin.

MATERIALS AND METHODS

Total thirty four cross breed cows were presented with history of normal cycle without any clinical

abnormalities and returned to heat after three or more consecutive services. All the animals were managed by the farmers individually in dairy farm with almost similar managerial conditions. The animals had history of normal estrus cycles with thick vaginal discharge at the time of estrus. Per rectal examination was carried out to detect any ovarian cyst and to check for enlarged uterus and presence of fluid in the uterus. Owners were advised to consult at next estrus. Vaginal discharge was assessed for its colour, consistency and pH before treatment and after treatment at subsequent estrus. Repeat breeding due to uterine infection was considered on the basis of observing thick and turbid vaginal discharge along with increased pH of the discharge. Repeat breeder cows were divided into group A (n=16) and group B (n=18). Group A animals were treated with ciprofloxacin and tinidazole combination (Cflox-TZ IU^a) @ 60 ml intra uterine on alternate day for three times where as group B animals were treated with levofloxacin and ornidazole combination along with alpha tocopherol (Levoda IU^b) @ 60ml intrauterine at alternate day for three times. Before each intrauterine treatment external genitalia of cows were washed with distilled water diluted potassium permanganate solution. At estrus subsequent to treatment, the recovered cows were subjected to artificial insemination. Pregnancy was confirmed on basis of non return of the animal to heat and by trans-rectal palpation at 2-3 months post insemination to evaluate efficacy of levofloxacin long with alpha tocopherol in terms of conception rate.

RESULTS AND DISCUSSION

Vaginal discharge observed in all animals of present study was turbid, thick and mucopurulent which could be due to uterine and cervical infection (Saini *et al.*, 1995 and Singh *et al.*, 2001). Uterine and cervical infection suggests that during parturition, the physical barrier of the cervix, vagina and vulva are compromised, providing the opportunity for bacteria to ascend in the genital tract. Normally these infections are cured naturally by rapid involution of the uterus, discharge of the uterine contents and mobilization of the host defense including mucus, antibodies and phagocytes. Post parturient complication like retained placenta, dystokia, twins, dead foetus, milk fever etc. increases the risk of uterine infection because they delay the involution and reduces the bovines ability to control uterine infections. Rearing in unhygienic condition and insemination in non sterile condition also cause uterine infection. Increase of pH (7.5-8.0) of vaginal discharge was in agreement with previous studies in cattle with endometritis (Saini *et al.*, 1995 and Singh *et al.*, 2001). This could be due to bacterial contamination of uterine fluids and the increased pH is not suitable for survival of spermatozoa and embryo in the uterus

(Roberts 1986, Sheldon *et al.*, 2006). The uterine infection also appears to disrupt the endocrine function of the endometrium and luteolysis of the ovarian corpus luteum. Luteolysis is induced by the release of PGF₂ alpha from the uterine endometrium, which passes to the ovary from the uterus *via* localized vascular pathways, to initiate the regression of the corpus luteum. However during infection, bacterial toxin binds directly to uterine epithelial and stromal cell to stimulate the release of prostaglandin E₂ which is luteotropic and may prevent luteolysis (Bogan *et al.*, 2008). After treatment with both Ciprofloxacin as well as Levofloxacin combination, vaginal discharge was observed clear and transparent and pH of discharge was also observed within normal range (7.0-7.2) at next estrus, similar finding with ciprofloxacin combination was also reported by Singh *et al.* (2009). Overall recovery rate (RR) and conception rate (CR) was recorded as 87.50% and 62.50% for Ciprofloxacin combination treated group and 83.34% and 77.78% for levofloxacin along with alpha tocopherol combination treated group respectively (Table-1). RR was always higher in ciprofloxacin then levofloxacin treated group, it might be due to ciprofloxacin can acts in presence of organic debris. CR was higher in levofloxacin treated group in present study it may be due to presence of alpha tocopherol (Vitamin E) which appears to enhance host defenses against infections by improving phagocytic cell function and also improves fertility. Uterine endometrial treatment with alpha tocopherol might have improves oxygen utilization, health of superficial layer of endometrium and provide assistance for metabolism as an antioxidant for effective innate defense. Bhattacharyya *et al.* (2011) and Markandeya *et al.* (2010) have found higher CR with levofloxacin than ciprofloxacin treated group but lesser than present study as CR recorded in present study with ciprofloxacin treatment was also higher than earlier report of Singla *et al.* (2004) and Purohit and Sharma (2007). However 80-85% CR was recorded with ciprofloxacin treatment by Purohit *et al.* (2003) and Das (2004). Singla *et al.* (2004) have shown that ciprofloxacin treatment @ 1320 mg by intrauterine route for 3 days was useful in 85% cases to clear the oestral mucus and 47.05% cows conceived. Dhillon *et al.* (2005) noted that bacteriological cure rate following Ciprofloxacin-Tinidazole combination was found to be significantly better against obligate anaerobes (90%) than aerobes (73.30%). However, results for conception rate (40%) were not encouraging.

Conclusion

Based on the present study, it is concluded that Levofloxacin, Ornidazole and Vitamin E combination is more effective to control incidence of repeat breeding problems in field condition.

Table 1: Recovery rate and conception rate of treated animal

Treatment Group	No. of animal treated	No. of animal recovered (Based on pH & colour of vaginal discharge)	No. of animal conceived after A.I	Recovery rate	Conception rate
A	16	14	10	87.50	62.50
B	18	15	14	83.33	77.77

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