

EFFECT OF SYSTEMIC AND INTRAUTERINE ADMINISTRATION OF DRUG ON ENDOMETRITIS IN COW

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ABSTRACT

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A total of 18 selected cows with endometritis were randomly allocated to 3 groups, comprising of 6 animals in each group. Ceftriaxone sodium at a dose rate of 10 mg/kg body weight was administered only once through I.V., I.M. and I.U. routes to each of 6 animals in different groups. Efficacy of the treatment of endometritis with Ceftriaxone was judged on the basis of bacteriological record. The average bacterial colonies count recorded was 247.66×10^6 /ml of uterine fluid before treatment in all groups. The mean bacterial colony counts per ml of uterine fluid decreased to the minimum ($4.00 \pm 0.36 \times 10^6$ /ml) 3 hours after I.V, 1 hour ($5.33 \pm 0.55 \times 10^6$ /ml) after I.U and 6 hours ($5.33 \pm 0.66 \times 10^6$ /ml) after I.M. administration of drug and again increased gradually reaching to $56.66 \pm 1.80 \times 10^6$ /ml, $85.33 \pm 2.78 \times 10^6$ /ml and $81.16 \pm 1.24 \times 10^6$ /ml of uterine fluid, respectively at 72 hours. The estrual discharge was mucopurulent before treatment & became clear after treatment. Before treatment all the endometritic cows were positive to white side test which became negative post treatment.

KEY WORDS: Endometritis, Cow, Drug and Microbial loads

Endometritis is one of the serious and common problems in dairy animals that may ultimately lead to infertility in cattle and thus, heavy economical losses may occur in dairy industry. Uterine infections particularly endometritis is one of the important reasons for infertility in bovines. The incidence of bovine endometritis varies from 15 to 57 %, (Sahadev, 2005) and the variability mainly depends on sanitation practiced during peripartum and immediate postpartum period. The other important reasons are unhygienic A.I., service by an infected bull and systemic infections. The bacterial contamination of the uterus during and immediate to parturition virtually occurs in all the cows and if the contamination worsen due to bacterial colonization it leads to endometritic (Sheldon, *et al.*, 2002). The uterus of cow also frequently becomes

contaminated with specific and non – specific bacteria during pre and post partum period, which may result in mucopurulent vaginal discharge. The uterine infection often resolved spontaneously. However, in some cows discharge persists or become foul smelling and produces metritis or endometritic with a consequential effect on fertility. The indiscriminate and prolonged use of antimicrobials in the absence of in-vitro sensitivity has contributed to the emergence of resistant strains of bacteria. Thus isolation, preliminary identification and determination of drug sensitivity of the causative organisms have become very important for effective therapy of Gynaecological infections and to limit the development of drug time to time by various workers against bacterial isolates from cases of endometritic (Gupte and Deopurkar, 1993).

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The present study was conducted on 18 endometritic cows which were screened based on the history, nature of estrual discharge, gynaecological examination, bacterial count Diliello (1979) in uterine fluid and white side test, Popov, (1969).

The animals were allocated to 3 groups, comprising of 6 animals in each group. Ceftriaxone sodium at a dose rate of 10 mg/kg body weight was administered only once through I.V., I.M. & I.U. routes to each of 6 animals in different groups. The cows in estrus were properly restrained and uterine discharge was collected at pre-treatment and post-treatment subsequent estrus following procedure of Zemjanis (1970) with slight modification by Sharma *et al.*, (1981). The bacterial load in uterine discharge was then estimated by plate count, (Dilliello, 1979). Average numbers of bacterial colonies were counted and bacterial load per ml of uterine discharge was calculated by multiplying with the dilution factor. *In-vitro* antibiotic susceptibility test of the isolates against Ceftriaxone sodium was also done at different levels of drug concentration by tube dilution and plate test (Agar disk diffusion) method as described by Ericsson and Sherris (1971) to calculate MIC of drug. The uterine fluid from each cows suffering from endometritis was collected at 0 hour, 15, 30 minutes, 1, 2, 6, 8, 12, 24, 36, 48 and 72 hours following drug administration through different routes under strict sterile condition.

The nature of uterine discharge of endometritic cows was observed at estrus before treatment & post-treatment subsequent estrus. Prior to treatment the discharge was mucopurulent in most of the animals. After treatment during subsequent estrus, the discharge became clear in 100 per cent cases. The uterine discharge collected from all the endometritic cows were subjected to white side test before and after the treatment.

During the present study the average bacterial count was recorded to be 247.66×10^6 /ml which ranged from 190×10^6 to 301×10^6 /ml in the uterine discharge of endometritic cows. The values were in accordance with the finding of Deori *et al.* (2004) The mean bacterial counts decreased to the minimum ($4.00 \pm 0.36 \times 10^6$ / ml uterine fluid) 3 hours after I.V, 1 hour ($5.33 \pm 0.55 \times 10^6$ / ml) after I.U, and 6 hours ($5.33 \pm 0.66 \times 10^6$ / ml) after I.M. administration of drug and again increased gradually reaching to $56.66 \pm 1.80 \times 10^6$ / ml of uterine

fluid after I.V., $85.33 \pm 2.78 \times 10^6$ / ml of uterine fluid after I.U. and $81.16 \pm 1.24 \times 10^6$ / ml of uterine fluid after I.M. of drug administration at 72 hours. The difference in bacterial activity might be due to the action of ceftriaxone which inhibited the bacterial organism in the uterus. The above observation of the study was in agreement with finding of Black *et al.* (1954) and Hawk *et al.* (1957). The estrual discharge of all the endometritic cows was mucopurulent in nature which became clear in all the cases after treatment with Ceftriaxone. The result was in agreement with the finding of Saini *et al.* (1999) & Deori *et al.* (2004). Shaktaval *et al.* (2006) also stated that most of the cows with endometritis had purulent discharge before treatment. Before treatment the uterine discharges of all the endometritic cows were positive to white side test which turned to be negative after treatment. The uterine discharges of endometritic cows remain rich in leucocytes & cellular debris to give colour reaction to the white site test (Popov, 1969).

The minimal therapeutic concentration (MIC) of Ceftriaxone effective against the microorganism isolated from the cases of endometritis during the present study was calculated to be 0.38 µg/ml. Perry & Schentag (2001) have reported the MIC of Ceftriaxone as 1.0 µg/ml which has been shown to be most effective against the majority of sensitive Gram- positive and Gram-negative pathogens have reported it in the range of 0.02 to 0.1 µg/ml in mare Soback and Ziv (1987) also determined the MIC of Ceftriaxone using the two fold agar dilution method and reported the value as 0.03 µg/ml for *E. coli*, 0.06 µg/ml for *Salmonella* & 0.2 µg/ml for *Pasteurella*. During the present study, Ceftriaxone appeared to have good antimicrobial activity *in-vitro* against the tested bacterial strain isolated from endometritic cases. The serum concentration of Ceftriaxone also remained clearly greater than the MIC values during 12-24 hours sampling period after the drug was administered through I.V., I.M. & I.U. at a low dosage (10 mg/kg body weight). Ceftriaxone may therefore prove to be a useful drug in the treatment of endometritis.

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