

Cephapirin Intervention for Improved Fertility in Repeat Breeder Buffaloes with Subclinical Endometritis

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ABSTRACT

This pilot study was conducted to check the intervention of cephapirin on the reproductive performance of repeat breeder buffaloes with subclinical endometritis. Endometrial cytology by cytobrush technique was used to diagnose the subclinical endometritis and selected animals (n=12) were randomly divided in two equal groups. Group-I buffaloes were not given any treatment, whereas Group-II buffaloes were administered with benzathine cephapirin once intrauterine. The recovered animals were inseminated at subsequent estrus and pregnancy diagnosis was performed 60 days later. The recovery rate and conception rate were significantly higher ($p \leq 0.05$) in Group II (83.33 and 80.00 %) as compared to Group I (0 % each). Based on the results, it can be concluded that Cephapirin (Metricef[®]) was effective in repeat breeder buffaloes with subclinical endometritis.

Key word: Cephapirin, Cytobrush, Repeat breeder buffaloes, Subclinical endometritis.

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INTRODUCTION

Breeding buffaloes were linked to a high prevalence of infertility issues (Modi *et al.*, 2011). On clinical evaluation, repeat breeding and anestrus are the two major causes of infertility in buffaloes (Saraswat and Purohit, 2016), however compared to cattle the incidence of repeat breeding is low (8.68% vs. 18.79%) in the buffalo (Patel *et al.*, 2007). The rate of occurrence of SCE in buffaloes was much more common than cows (Moghaddam and Mamoei, 2004), which might be due to improper closure of vulval lips, poor hygienic environment, vaginal stimulation for milk letdown and wallowing habit (Azawi, 2006). Buffaloes not conceiving after 3 or more services have been considered as repeat breeders (Sah and Nakao, 2006). The etiology of repeat breeding appears to be multifactorial, one among them is subclinical endometritis. Early detection of subclinical endometritis may lower the expenses associated with raising buffaloes for dairy farms or individual farmers.

Swabs, lavage, and uterine biopsies are common tests for diagnosing endometritis; however, they may irritate and distort cells. The cytobrush technique is a unique way for uterine cytological testing and is thought to be a consistent and reliable method in dairy animals (Barlund *et al.*, 2008; Honparkhe *et al.*, 2014). Uterine infections have been treated with a variety of approaches, including intrauterine or parenteral antibiotics and various immunomodulators such as *E. Coli* lipopolysaccharide, oyster glycogen, or proteolytic enzymes (McDougall, 2001; Singh *et al.*, 2016). Cephapirin, a first-generation cephalosporin antibiotic, is active against Gram-positive organisms and anaerobic bacteria, and less active against Gram-negative organisms and therefore a

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rational antibiotic choice for intrauterine infusion (McDougall, 2001; LeBlanc *et al.*, 2002). Hence, this pilot study was conducted to evaluate the effect of single intrauterine infusion of benzathine cephapirin on the reproductive performance of repeat breeder buffaloes with subclinical endometritis.

MATERIALS AND METHODS

The repeat breeding buffaloes (DIM \geq 100 days) at spontaneous estrus presented to the Veterinary Clinical Complex of the College in Bidar (Karnataka, India) were examined for the status of genitalia (through rectal palpation) and cervico-vaginal mucus (CVM). The cytobrush technique was used to know the endometrial cytology in buffaloes with clear

cervico-vaginal discharge for confirmation of subclinical endometritis. The subclinical endometritis was diagnosed on the basis of clear cervico-vaginal mucus and more than 4% polymorphnuclear cells (PMN; Fig. 1) as suggested by Singh *et al.* (2016).

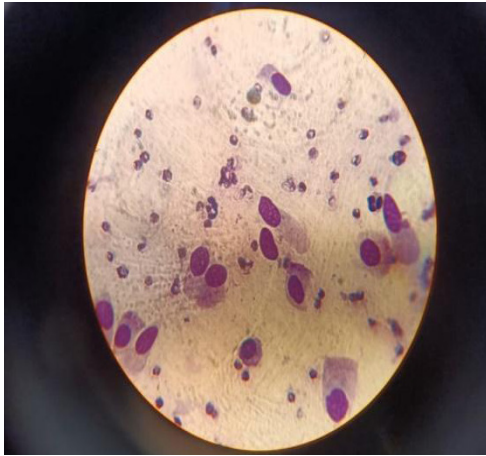


Fig. 1: Endometrial cells with PMN cells

Buffaloes diagnosed as positive for SCE (n=12) were randomly divided into two equal groups (Group I and II) of six animals each. The Group-I buffaloes served as control without any treatment and the Group-II buffaloes received single dose syringe administration of Cephapirin 500 mg (Metricef[®], MSD Animal Health) by intrauterine route on the day of diagnosis. The clinical recovery in buffaloes was assessed at subsequent estrus following treatments by determining the reduction of PMN cells in endometrial cytology by cytobrush technique and the animals without infection were inseminated with 0.25 mL of good quality frozen-thawed semen. Pregnancy was confirmed by per rectal examination 60 days following AI. Data obtained were analyzed by paired t-test and Chi-square test using SPSS software.

RESULTS AND DISCUSSION

Cephapirin administration resulted in a significant ($p < 0.05$) decrease in PMN cell count, which in turn caused a significant recovery from subclinical endometritis at the following estrus. In contrast, while untreated buffaloes showed a non-significant ($p > 0.05$) decrease in PMN cell count (Table 1). Rate of cytological recovery was 83.33% in cephapirin treated SCE buffaloes as compared to no recovery observed in untreated buffaloes. Further, conception rate was nil in control group, whereas 80.00 % conception was noted in Group-II. The rate of recovery and conception was significantly higher ($p < 0.05$) in Group-II as compared to Group-I.

Table 1: PMN cells count (Mean \pm SE) before and after treatment in SCE repeat breeder buffaloes

Group (n=6)	PMN cells value before treatment	PMN cells value after treatment	Significance (p value)
Group I (Control)	5.33 \pm 0.21 ^a	4.83 \pm 0.75 ^a	0.542
Group II (Cephapirin)	7.00 \pm 0.44 ^a	0.67 \pm 0.67 ^b	0.001

Values with different superscript (a,b) within the rows differ significantly ($p < 0.05$)

Similarly, Kasimanickam *et al.* (2005) and Nehru *et al.* (2018) concluded that intrauterine antibiotic group had significant impact on recovery, clearance of pathogenic bacteria and improvement of reproductive performance in subclinical endometritic buffaloes than the untreated group, whereas Kumar *et al.* (2013) reported 50 % conception in cephapirin group as compared to other groups.

From the outcome of this experiment, it can be concluded that single administration of Cephapirin (Metricef[®]) is effective in repeat breeder buffaloes with subclinical endometritis. However, the numbers of animals in the study were less, hence it needs validation using larger sample size.

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