



Comparative Studies on Therapeutic Efficacy Intrauterine Turmeric Extract and Ceftiofur Sodium Alone and in Combination with Micronutrients Supplementation in Postpartum Metritic Crossbred Cows

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ABSTRACT

Background: The postpartum period is crucial in dairy cows and is marked by major physiological and metabolic changes that affect milk production, immune response and fertility. Nutrition remains the most important lever for limiting the negative energy balance and its consequences on general health status in highly selected dairy cows. Therefore, the present study is design to investigate the Therapeutic efficacy intrauterine turmeric extract and ceftiofur sodium alone and in combination with micronutrients supplementation in postpartum metritic crossbred cows.

Methods: The present study was conducted on 24 crossbred cows with history of postpartum metritis randomly divided into four treatment groups: intrauterine turmeric extract (group I), intramuscular ceftiofur sodium (group II), intrauterine turmeric extract + micronutrient supplementation (group III) and intramuscular ceftiofur sodium + micronutrient supplementation (group IV).

Result: The mean time interval required for resumption of cyclicity was highest in gp II followed by gp I, gp III and gp IV. The group turmeric extract + micronutrients supplementation and ceftiofur sodium + micronutrients supplementation group registered a considerable higher conception rate (66.66) followed by (50%) in turmeric extract and ceftiofur sodium group.

Key words: Ceftiofur sodium, Conception rate, Micronutrient supplementation, Postpartum metritis, Turmeric extract.

INTRODUCTION

Postpartum metritis is one of the most important disorders in cows causing high economic losses due to prolonged open days and inter-calving intervals, resulting in involuntary culling of animal. Postpartum metritis is clinically characterized by incomplete or delayed uterine involution, enlarged uterus on rectal palpation with exhibiting varying amount of purulent mucopurulent discharge through vulva, reduced appetite and milk yield (Bhaumik *et al.*, 1992 and Cairoli *et al.*, 1993). It is more common in early postpartum period as uterus is exposed to high risk of infection (Walia *et al.*, 2010). To reduce these high economic losses effective ameliorative measures are needed.

Presently, treatment of such infertility is mainly achieved using intrauterine antibiotics, antiseptics and less commonly by hormones. The inconsistent results, high cost of treatment, compulsory milk disposal and inhibition of natural uterine defense, emergence of resistant bacterial strains, after antibiotic/antiseptic treatment made it unethical and uneconomical (Hussain and Daniel, 1992, Sarkar *et al.*, 2016). Now a day, the major problem faced by the world is the multiple drug resistance pathogens (MDR) because of the indiscriminate use of commercial antimicrobial drugs. Plants used for traditional medicine contain a wide range of bioactive molecules, making them rich sources of different types of medicine particularly antimicrobial properties (Sarkar *et al.*, 2016, Nair *et al.*, 2005). Antimicrobials of plant

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origin have enormous therapeutic potential (Cunha, 2001) They are effective in the treatment of infectious diseases while simultaneously minimizing many of the side effects that are often associated with synthetic antimicrobials or antibiotics. There are many published reports on the effectiveness of traditional plants against Gram positive and Gram negative microorganisms and as a result, plants are still recognized as the basis for modern medicine to treat infectious diseases (Evans, 2002).

Turmeric (*Curcuma longa*) exhibit immunomodulatory, antiinflammatory, antifungal, antibacterial, antiviral and

antioxidant properties to resolve the problem without facing antibiotic resistance and milk disposal problem (Ghazanfari *et al.*, 2002, Subapriya and Nagini, 2005). Similarly, Minerals and vitamins have direct or indirect relationship with productive and reproductive health of animals. Deficiencies and imbalance of minerals during peri-parturient period are either solely incriminated for or associated with anestrus (Patil and Deshpande, 1979; Agarwal *et al.*, 1985; Singh and Vadnere, 1987), repeat breeding (Prajapati *et al.*, 2005), metabolic disorders, retention of foetal membranes (Gupta *et al.*, 2005), dystocia, abortion (Sharma *et al.*, 2005), weak calf syndrome (Logan *et al.*, 1990), milk fever, vulval discharge (Husband, 2006) and poor conception rate (Khasatiya *et al.*, 2005, Abdullah *et al.*, 2017). Thus have negative impact on the subsequent fertility of the cow. Keeping all those useful effects of turmeric and micronutrients in mind, the current study is designed to investigate the therapeutic efficacy of intrauterine turmeric extract and ceftiofur sodium alone and in combination with micronutrients supplementation in postpartum metritic crossbred cows.

MATERIALS AND METHODS

The study was carried out on clinical cases brought to the Teaching Veterinary Clinical Complex of College of Veterinary Science and A.H., Mhow and in villages in and around Mhow.

Experimental design

The postpartum metritic dairy cows (n=24) were randomly selected on the basis of calving history, gynaeco-clinical findings such as presence of abnormal uterine discharge and other associated findings, and were allocated equally into four groups

Group I: Cows In this group (n=6) were administered intrauterine Curcuma longa extract having concentration @ 20 mg/ml dissolved in saline to make 30 ml, at 24 hrs interval for 3 days.

Group II: Cows In this group (n=6) were administered intramuscular ceftiofur sodium @ 2.50 mg/kg B.W. at 24 hrs interval for 3 days.

Group III: Cows In this group cows (n=6) were administered intrauterine Curcuma longa extract having concentration @ 20 mg/ml dissolved in saline to make 30 ml, at 24 hrs interval for 3 days + 25gm micronutrients orally for 20 days.

Group IV: Cows In this group (n=6) were administered intramuscular ceftiofur sodium @ 2.50 mg/kg B.W. at 24

hrs interval for 3 days + 25gm micronutrients orally for 20 days.

Artificial insemination was performed at the next estrus in all animals.

Therapeutic efficacy

- The efficacy was judged on the basis of time taken for
- Cessation of uterine discharge
- Resumption of cyclicity
- First service conception

RESULTS AND DISCUSSION

Cessation of uterine discharge

The mean time interval required for the clearance of uterine discharge from the commencement of treatment was lowest in group IV (8.16±0.47 days) and highest in group I (10.16±0.47 days) where as in group II and III the intervals were 8.66±0.49 and 8.50±0.42 days, respectively. Statistical analysis revealed that the time required for the clearance of uterine discharge was significantly different between all the groups (Table 1).

The observations indicated that the mean time interval required for cessation of uterine discharge were significantly (p<0.05) different between Groups after treatment. These findings are in agreement with Jain (2006) who recorded clearance of uterine discharge in 8.83±1.10 and 9.83±0.79 days in control and post partum metritic antibiotic along with PGF_{2α} treated buffaloes respectively.

Resumption of cyclicity

Among all the animals treated for metritis irrespective of any therapeutic regimen the first postpartum oestrus was exhibited within 100 days from calving. The mean time interval required for resumption of cyclicity was highest (98.66±4.12) in group II days followed by group I (87.50±1.47) days, group III (73.50±2.04) days and group IV (66.16±1.66) days, respectively.

Statistical analysis revealed that the time interval required after treatment for resumption of cyclicity was significantly different between groups (Table 2). It was observed that the time interval required after treatment for resumption of cyclicity was significantly higher (p<0.05) in group 2 followed by group 1 and found non significant difference in group 3 and group 4.

These findings are in agreement with Jeremejeva (2015) who observed the number of days to first service as 83.6±7.9 days in clinical endometritic cows treated with

Table 1: Time interval required for cessation of uterine discharge (Mean ± SE) in different treatment groups.

Groups (n=6)	Treatment regimen	Uterine discharge Cessation interval (days)
I	Turmeric extract	10.16±0.47 ^a
II	Ceftiofur sodium	8.66±0.49 ^{ab}
III	Turmeric extract + Micronutrients supplementation	8.50±0.42 ^b
IV	Ceftiofur sodium + Micronutrients supplementation	8.16±0.47 ^b

*Mean with different superscript differ significantly from each other (p<0.05).

Table 2: Interval (days) required for resumption of cyclicity (Mean \pm SE) in different treatment groups.

Groups (n=6)	Treatment regimen	Resumption of cyclicity (days)
I	Turmeric extract	87.50 \pm 1.47 ^b
II	Ceftiofur sodium	98.66 \pm 4.12 ^a
III	Turmeric extract + Micronutrients supplementation	73.50 \pm 2.04 ^c
IV	Ceftiofur sodium + Micronutrients supplementation	66.16 \pm 1.66 ^c

*Mean with different superscript differ significantly from each other ($p < 0.05$).

Table 3: Conception rate in different treatment groups (%).

Groups (n=6)	Treatment regimen	Conception rate %
I	Turmeric extract	50(3/6)
II	Ceftiofur sodium	50(3/6)
III	Turmeric extract + Micronutrients supplementation	66.66(4/6)
IV	Ceftiofur sodium + Micronutrients supplementation	66.66(4/6)

*Figures in parenthesis indicate number of cows.

ceftiofur. These findings are also in agreement with Jain (2006) who observed first postpartum oestrus at 89 \pm 165.88 days in group I (PGF2 α) + (antibiotic), and higher result than the present study as 108.50 \pm 2.36 days in postpartum metritic buffaloes treated with antibiotic (Group II), respectively.

First service conception

All the treatment group cows which come in heat allowed for natural service or inseminated with frozen thawed semen at 12 hours interval from the onset of oestrus. All the inseminated or natural serviced cows were examined per rectally after 60 days for confirmation of pregnancy.

Conception rate observed in the present study are presented in Table 3. The conception rates from responded cows were higher 66.66% in III and IV followed by 50.00 percent in Groups, I and II respectively.

In the present study, the conception rate of Group I was 50%. These findings are in agreement with Kumar *et al.* (2018) who recorded 50% conception rate in repeat breeder endometritic crossbred cows treated with intrauterine turmeric extract.

The present findings in Group II are slightly lower than the finding of Jeremejeva (2015) who observed 64% first service conception rate in cows suffered with clinical endometritis, treated with ceftiofur. The present findings in Group III are slightly higher than the finding of Kumar *et al.* (2018) who observed 62.5% conception rate in repeat breeder endometritic crossbred cows treated with intrauterine hydro-alcoholic turmeric.

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