

## THERAPEUTIC MANAGEMENT OF SUBCLINICAL MASTITIS IN BUFFALOES

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**ABSTRACT**

The present investigation was carried out to study the therapeutic efficacy of marbofloxacin along with vitamin E, selenium and trisodium citrate against subclinical mastitis in buffaloes. The study was carried out on lactating buffaloes maintained at different organized dairy farms in and around Bidar, Karnataka. Screening of subclinical mastitis was done by California Mastitis Test (CMT) and Electrical Conductivity (EC). Milk samples positive for subclinical mastitis were considered for isolation and identification of bacteria pathogens by cultural examination and biochemical tests. 18 out of 81 lactating buffaloes were found positive for subclinical mastitis affecting one or two quarters giving a quarter wise prevalence of 11.33% and animal wise prevalence of 22.22%. Out of 27 positive milk samples 14 (51.85%) were found positive for *Staphylococcus* spp. followed by *Streptococcus* spp. (33.33%) and *E. coli* (14.81%). The antibiogram of the bacterial isolates to standard antibiotic discs determined by disc diffusion method revealed highest sensitivity to gentamicin and enrofloxacin followed by ceftiofloxime, moxifloxacin, cefoperazone, tetracycline and least sensitive to amoxicillin with clavulanic acid. Positive quarters treated with single dose of marbofloxacin at the rate of

8 mg/kg body weight intramuscularly recorded the efficacy of 58.33%. Positive quarters treated with marbofloxacin single dose along with vit E, selenium and trisodium citrate recorded the efficacy of 80%. Hence, marbofloxacin along with vit E, selenium and trisodium citrate may be used effectively to treat subclinical mastitis in buffaloes.

**Keywords:** *Bubalus bubalis*, buffaloes, marbofloxacin, vitamin E, selenium, trisodium citrate, subclinical mastitis

**INTRODUCTION**

Mastitis is one of the important disease in dairy animals which adversely affects animal health, quality of milk and economics of milk production. In contrast to visible changes in clinical form of mastitis, there is absence of gross abnormalities in the milk or udder in subclinical mastitis. In India economical losses due to Subclinical Mastitis (SCM) in buffaloes has been estimated to be Rs. 1723.32 crore (Dua, 2001).

Mastitis is often caused by bacteria. In sufficient contact between antibiotic and causative bacteria at the site of infection is important cause for failure of mastitis treatment (Sandholm *et al.*, 1990). Single Injection Short Acting Antibiotic (SISAAB)

protocols have been developed for the treatment of mastitis with marbofloxacin in cattle (Pillet *et al.*, 2013; Grandemange *et al.*, 2017; Mahapatra *et al.*, 2018). Subclinical mastitis is associated with release of free radicals and decreased total antioxidants capacity in milk (Atakisi *et al.*, 2010). Beneficial effects of antioxidant vitamin E along with antibiotics was proved in mastitis (Mikherjee, 2007; Mahapatra *et al.*, 2018). Trisodium citrate has buffering and antimicrobial properties which can maintain pH of milk and beneficial effect has been recorded in subclinical mastitis in buffaloes (yousaf *et al.*, 2010) and in bovine clinical mastitis (Rai *et al.*, 2013); Mahapatra *et al.*, 2018). Hence, the present study was undertaken to evaluate the therapeutic efficacy of single dose of morbofloxacin along with vitamin E and trisodium citrate against subclinical mastitis in buffaloes.

## MATERIALS AND METHODS

The present study was conducted on 81 lactating buffaloes under different stages of lactation maintained at different organized dairy farms in and around Bidar, Karnataka. These buffaloes were screened for detection of subclinical mastitis by California Mastitis Test (CMT) as per Schalam and Noorlander (1957) and also by Electrical conductivity of milk sample by using hand held Ecotester (oakion). EC value more than 5ms/cm is considered as positive for subclinical mastitis (Patil *et al.*, 1996).

A total of 27 quarters from 18 buffaloes positive for both CMT and EC test were subjected to isolation and identification of bacteria based on morphological, cultural, and biochemical characteristics as per the method of Buchnan and Gibbons (1984). Further, the sensitivity of each

bacterial isolates to standard antibiotic discs was determined by disc diffusion method (Bauer *et al.*, 1996).

18 buffaloes found positive on CMT and EC tests were divided into two groups of 9 each. Buffaloes of Group I were treated with Marbofloxacin through intramuscular route as single dose at the rate of 8 mg/kg body weight. Buffaloes of Group II were treated with Marbofloxacin through intramuscular rate as single dose at the rate of 8 mg/kg body weight along with vitamin E and selenium (E Selenium zydus AH) intramuscularly as single dose at the rate of 1 ml/50 kg body weight and Trisodium citrate at the rate of 30 g/animal/day for 5 days.

The response to treatment was evaluated based on examination of milk samples by CMT and EC tests before and after 5<sup>th</sup> day of treatment.

## RESULTS AND DISCUSSION

Out of 81 lactating buffaloes, 27 quarters of 18 buffaloes were found positive for subclinical mastitis recorded quarter wise prevalence of 11.33% and animal wise prevalence of 22.22%. These prevalence rates are in accordance with earlier reports of Patil *et al.* (1995); Joshi and Gokhale (2006). However, comparatively higher prevalence rates of subclinical mastitis in buffaloes were recorded by Sharma *et al.*, (2007); Ali *et al.*, (2015). Higher prevalence rates may be associated with many factors such as herd size and variation in management practices.

Out of 27 milk samples of subclinical mastitis 14 (51.85%) were found positive for *Staphylococcus* spp. which was found to be the major etiological agent causing subclinical mastitis *Streptococcus* spp. were second largest pathogens

accounting for 33.33% followed by *Escherichia coli* (14.81%). These findings agree with earlier reports of Khan and Muhammad (2005); Sharma *et al.* (2007); Ali *et al.* (2015).

The antibiogram of bacterial isolates revealed highest sensitivity to gentamicin (77.77%) and enrofloxacin (70.37%) followed by ceftriaxone (55.55%), moxifloxacin (51.85%), cefoperzone (40.74%), tetracycline (33.33%) in decreasing order and least sensitive to amoxicillin and clavulanic acid (18.51%). Similarly, higher sensitivity with gentamicin was recorded by Sharma *et al.* (2007) and enrofloxacin by Ali *et al.* (2015). Poor sensitivity to amoxicillin and clavulanic acid may be attributed to production of  $\beta$  - lactamase enzyme by resistant strains of isolates due to their frequent use.

Out of 12 quarters of nine buffaloes treated with single dose of marbofloxacin, 7 quarters were cured giving an efficacy of 58.33%. This agrees with earlier reports of Pillet *et al.* (2013); Grandmange *et al.* (2017); Mahapatra *et al.* (2018) in clinical mastitis in cows.

Out of 15 quarters of nine buffaloes treated with single dose of marbofloxacin along with vitamin E, selenium and trisodium citrate, 12 quarters were cured giving an efficacy of 80%. Similarly, higher efficacy rates were observed by Mahapatra *et al.* (2018) with single dose of marbofloxacin along with vitamin E and Selenium in mastitis in cows. This could be attributed to increased phagocytic activity of vitamin E when provided with antibiotic (Mukerjee, 2007).

Beneficial effect of trisodium citrate along with vitamin E and Selenium could be attributed to decreased Somatic Cell Count and electrical conductivity (Santoshi *et al.*, 2018).

## CONCLUSION

From the present study it may be concluded that single dose of marbofloxacin 8 mg/kg body weight, I/M along with Vitamin E, Selenium and trisodium citrate was proved as an effective therapy against subclinical mastitis in buffaloes.

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