

SHORT COMMUNICATION

Antimicrobial Study of Clinical Mastitic Milk Samples of Cows in and Around Bikaner

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Key Worlds: Antibioqram, Cow, Clinical Mastitis, Milk Samples.

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INTRODUCTION

Mastitis, an inflammatory condition of the mammary gland, is one of the most economically important diseases of dairy herds. This disease is more prevalent in high yielding dairy cattle. It is caused due to colonization of pathogenic bacteria causing series of events that lead to major alteration in the mammary tissues and composition of milk secreted from the tissue cells (Batavani *et al.*, 2007; Goel *et al.*, 2008). Clinical mastitis is recognized by abnormal milk, varying degree of mammary gland inflammation (redness, heat, swelling and pain) with or without illness of the cow. Mastitis in dairy animals leads to heavy economic losses due to reduction in milk production, altered composition, and cost of treatment of affected animals. The clinical mastitis in different cases can be identified by external symptoms such as udder swelling, touch, pain, redness and hardness of the udder. The objective of the present study was to assess the sensitivity of bacterial isolates from mastitic milk samples of cows to some selected antibiotics.

MATERIALS AND METHODS

The milk samples from 30 quarters with clinical mastitis from 24 indigenous and crossbred cows (single or multiple affected quarters) of different age, parity and lactational status were included in this study. Milk samples were collected aseptically in sterile test tubes for identification of causative agent of clinical mastitis.

Isolation and identification of bacteria was carried out as per method of Cowan and Steel (1975). The bacterial isolates were subjected to *in vitro* sensitivity test to six antibiotics on Muller-Hinton agar (Bio mark) using the disc diffusion technique (Bauer *et al.*, 1966). The antimicrobials used singly or in combination included amoxicillin-clavulanic acid, ampicillin-cloxacillin, cefoperazone, cloxacillin, colistin, ceftriaxone-tazobactam. Minimal inhibitory concentration (MIC) value of the bacterial organism was analyzed against common antibiotic discs (M/s Hi Media laboratories Ltd., Mumbai).

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RESULTS AND DISCUSSION

Among total isolates of mastitic milk, *Staphylococci* and *E. coli* isolates were maximum in number, followed by *Streptococcus* spp., *Corynebacterium* spp. and *Bacillus* spp. (Plate 1 to 3). The overall *in vitro* antibiogram study of bacterial isolates revealed



Plate 1: Antibiotic sensitivity pattern of clinical mastitogenic milk

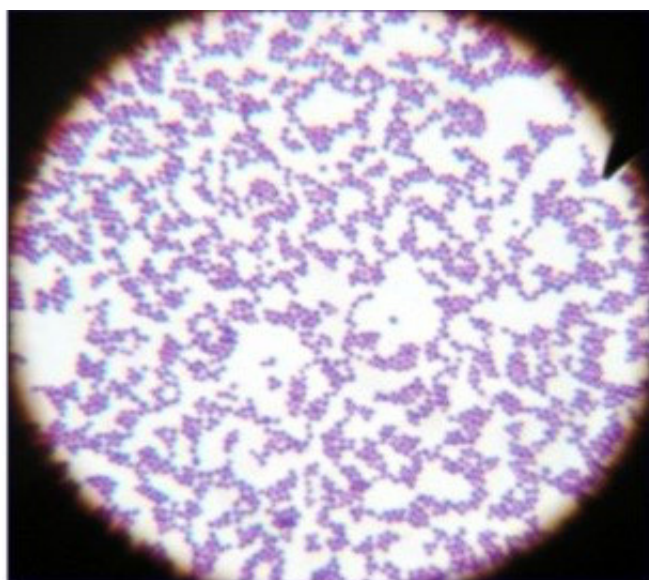


Plate 2: *Staphylococci* from mastitic milk

the highest sensitivity for ceftriaxone-tazobactam, followed by cefaparazone, amoxicillin-clavulanic acid, cloxacilin and ampicillin-cloxacillin, and the least for colistin (Table 1). All the isolates of *Staphylococci* were highly susceptible (100%) to ceftriaxone, cefaparazone and amoxicillin-clavulanic acid, whereas 88.88% isolates showed sensitivity to cloxacillin, 74.07% to ampicillin-cloxacillin and 62.96% were sensitive to colistin. Similarly, all the isolates of *Streptococci* were found highly susceptible to amoxicillin-sulbactam, ceftriaxone and cefaparazone (95.65, 95.45 and 95.23%, respectively), whereas 80.95% were sensitive to cloxacillin, 66.66% to ampicillin-cloxacillin and 57.14% to colistin.

The 100 % isolates of *E. coli* were sensitive to ceftriaxone, amoxicillin-sulbactam and cefaparazone, followed by cloxacillin (91.66%), ampicillin-cloxacillin (83.33%) and colistin (66.66%). The 100 % isolates of *Bacillus* spp. were sensitive to cefaparazone and ceftriaxone followed by amoxicillin-sulbactam (85.71%), ampicillin-cloxacillin (83.33%), colistin (66.66%) and cloxacillin (40.00%). Single isolate of *Corynebacterium* spp. found in a single sample was 100 % sensitive to ceftriaxone, cefaparazone and amoxicillin-sulbactam followed by cloxacillin (66.66%), ampicillin-cloxacillin (80.00%) and colistin (33.33%). Almost similar results have been reported earlier by Ramprabhu *et*

Table 1: Overall sensitivity of various antibiotics against bacterial isolate from clinical mastitis

S.No.	Antibiotic	Sensitivity (%)
1.	Ceftriaxone-tazobactam	98.59
2.	Cefaparazone	98.57
3.	Amoxicillin-clavulanic acid	97.26
4.	Cloxacillin	80.28
5.	Ampicillin-cloxacillin	73.28
6.	Colistin	60.56



Plate 2: *E. coli* Bacteria Colonies on Macconkey Agar Culture

al. (2004); Ghose and Sharda (2004) and Bhikane *et al.* (2009).

The present study evaluated the efficiency of different parenteral antimicrobials for treatment of clinical mastitis in 24 cows based on isolation of *Staphylococcus* spp., *E. coli*, *Streptococcus* spp., *Corynebacterium* spp. and *Bacillus* spp. and their antibiotic sensitivity test. Among six antibiotics, ceftriaxone-tazobactam was found most sensitive drug, followed by cefaparazone, amoxicillin-clavulanic acid, cloxacillin, ampicillin-cloxacillin and the least effective antibiotic was colistin.

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REFERENCES

- Batavani, R.A., Asri, S. and Naebzadeh, H. (2007). The effect of subclinical mastitis on milk composition in dairy cows. *Iranian J. Vet. Res.*, 8(3): 247-249.
- Bauer, A.W., Kirby, W.M.M., Sherris, J.C. and Turek, M. (1966). Antibiotics susceptibility testing by a standardized single disc method. *Am. J. Clin. Pathol.*, 45: 493-496.
- Bhikane, A.U., Gapat, S.M., Sakhare, M.P., Hase, P.B. and Syed, A.M. (2009). Efficacy of Ceftriaxone-tazobactam combination in treatment of clinical mastitis in bovines. *Intas polivet*, 10(1): 62-63.
- Cowan, S.T. and Steel, K.J. (1975). *Manual for the Identification of Medical Bacteria*. Cambridge University Press, Cambridge.
- Ghose, B. and Sharda, R. (2004). Streptococcal mastitis in dairy cows. *Indian Vet. Med. J.*, 28: 163-164.
- Goel, P., Kumar, A. and Sharma, A. (2008). Role of micronutrients as immunoregulator in farm animals with special reference to mastitis – A review. *Intas polivet*, 9(1): 13-19.
- Ramprabhu, R., Johnson, J., and Jayaram, R.N. (2004). Comparative antibiogram and clinical efficacy of ceftriaxone in bovine mastitis. *Indian Vet. J.*, 81(8): 863-864.