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Research Article

PREVALENCE OF SUBCLINICAL MASTITIS IN MURRAH BUFFALOES

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ABSTRACT

Prevalence of sub-clinical mastitis was determined in 239 quarter milk samples collected from 60 apparently healthy buffaloes. On the basis of International Dairy Federation criteria, 4.14, 4.60 and 2.09 per cent quarters were having sub-clinical, latent and non-specific mastitis, respectively. While considering the cultural examination and somatic cell count alone, 8.78 per cent and 6.27 per ent quarters were found positive for sub-clinical martitis respectively. Out of 23 isolates, *Staphylococcus epidermidis* (39.13%) and *Staphylococcus aureus* (30.43%) were the predominant organisms followed by *Streptococcus dysgalactiae* (13.04%), *Streptococcus agalactiae* (13.04%) and diphtheroids (4.34%).

Key words: Murrah buffaloes, prevalence, sub-clinical mastitis

Mastitis refers as the inflammation of mammary gland resulting in physical, chemical and bacteriological changes in milk. It can be classified into clinical and sub-clinical forms. Sub-clinical form of mastitis remains unnoticed due to absence of gross abnormalities in milk and udder. Animal with sub-clinical mastitis (SCM) acts as a reservoir for infection to other animals within a herd. For adoption of proper treatment and control measures, an early detection of SCM and knowledge regarding prevalence of different mastitogenic organisms is imperative. Although some reports on prevalence of SCM are available in buffaloes but invariably these are based on a single parameter and do not fulfill International Dairy Federation (IDF) criteria which is based on cultural examination and somatic cell count (SCC).

MATERIALS AND METHODS

Milk samples were collected from 239 quarters of 60 apparently healthy lactating murrah buffaloes of livestock farm located at CCS Haryana Agricultural University, Hisar. After discarding first few streams of milk, the teats apices were thoroughly scrubbed with cotton swab soaked in 70 per cent alcohol and about 20 ml milk from respective quarter was collected in sterilized test tubes. Bacteriological examination and the SCC of milk samples were performed as per the method described by Brown *et al.* (1981) and Schalm *et al.* (1971), respectively.

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RESULTS AND DISCUSSION

Milk samples of 60 apparently healthy buffaloes were screened for SCM, of which 30 per cent were culturally positive. Quarter-wise prevalence rate was found to be 8.78 per cent. Almost similar findings have been observed by Ahmad *et al.* (1991) and Dhakal and Kapur (1992), who reported quarter-wise infection rate ranging from 6.95 to 7.5 per cent. In contrast, Saini *et al.* (1994) reported lower quarter-wise prevalence rate of 2.59 per cent. However, Said and Abd.El-Malek (1968), Kalorey *et al.* (1983), Tuteja (1999) and Saxena (2000) had reported a comparatively high quarter-wise prevalence of SCM ranging from 15.65 per cent to 52.30 per cent. Tijare *et al.* (1999) suggested that the variation in prevalence rate might be due to various factors like climate, breed, managemental and hygienic practices adopted and the stage of lactation. The low prevalence of SCM in present study might be due to improved managemental conditions and adoption of proper control measures at the farm. Schultz *et al.* (1978) have reported 50% prevalence of SCM in herds not

using control measures. Living conditions of animals also contribute prevalence rate as Said and Abd.El-Malek (1968) observed a high quarter-wise infection rate of 52.30 and 42.40% in buffaloes kept in modern establishment and in small groups in rural areas, respectively as compared to those kept individually under village conditions in which infection rate was 25.00% only.

On the basis of SCC (above 5,00,000 per ml of milk) alone, 16.67 per cent of animals and 6.26 per cent quarters were found positive for SCM. The quarter-wise prevalence of SCM was comparable with the reports of Ahmad *et al.* (1991), who reported the prevalence rate of 6.95%. Contrary to this, Dahiya and Kapur (1984) reported much low prevalence rate of SCM as 3.25%. However, Tuteja (1999), Saxena (2000) and Sharma and Kapur (2000) reported high prevalence (16.56 to 31.33%) of SCM while considering SCC alone. In the present study, while considering IDF criteria, 4.14 per cent of the quarters were diagnosed as having SCM. The prevalence rate of SCM in the same animal population was lower in comparison to that determined by cultural examination and SCC alone. These observations are in close agreement with the findings of Dahiya and Kapur (1984), Tuteja (1999) and Saxena (2000) and Sharma and Kapur (2000). Somatic cell count is one of the measurements used most commonly as an indicator of SCM and found to be reliable and closest to bacteriological examination (Singh *et al.*, 1982). However, Mattila and Sandholm (1985) suggested that bacteriological examination of milk has not been fully reliable because a single bacteriological examination of quarter milk sample does not necessarily identify all the infected quarters. Therefore, the criteria adopted by IDF which is based on isolation of organism and elevated SCC more than 5,00,000 per ml of quarter milk, provides a better picture of prevalence of SCM than the either test alone. In the present study, only 4.60 per cent of the quarters having SCC less than 5,00,000 per ml of milk and culturally positive were found to have latent infections. However, Tuteja (1999), Sharma and Kapur (2000) and Saxena (2000) reported higher prevalence rate of latent infections ranging from 15.58 to 26.67 per cent. Significance of latent infections cannot be underestimated, as these are likely to convert into sub-clinical and clinical mastitis under favorable environmental conditions. Salsberg *et al.* (1984) and Roder and Gedek (1986) concluded that the type of organism and season could influence the SCC in milk. Mild inflammatory reactions accompanied by a low degree infection may go undetected. In the present study, 2.09% quarters having SCC more than 5,00,000 per ml of milk and culturally negative were found to have non-specific mastitis. In contrast, Tuteja (1999), Sharma and Kapur (2000) and Saxena (2000) reported a higher prevalence rate of 7.38, 9.42 and 8.72%, respectively for non-specific mastitis. Failure to detect pathogens in such cases may be due to the intermittent excretion of the organisms or their disappearance because of spontaneous recovery (Tolle, 1975). Schalm and Lasmanis (1968) reported 4 to 10 fold higher SCC in the last stripping of the milk suffering from SCM and chronic mastitis than the SCC of fore milk from healthy bovine quarter.

Physiological stress and seasonal effects were also reported to influence SCC variations. Increase in SCC in first few days of lactation and in late lactation is considered to be physiological. Tolla and Cabeli (1985) observed an increase in SCC with age, stage of lactation and residual milk. Other factors like corticosteroid therapy, intra-mammary infusion, transportation, change in diet and climate can also influence SCC. According to Anonymous (1998), about 30% of the milk samples from quarters with high SCC yielded no microorganisms in some types of infections especially chronic coliform infections. The number of bacteria in a sample may be too low to be detected by routine methods. In other cases, the infection may have been eliminated but an elevated SCC persists because of incomplete healing. It may also indicate the possible presence of an unusual micro-organism (*Mycoplasma* spp.) that does not grow on common culture media.

A total of 23 different microorganisms were isolated from 21 quarters milk samples (Table 1). *Staphylococcus* spp. (69.56%) was

Table 1

Relative frequency of different microorganisms

Organisms isolated from milk samples	Number of isolates (%)
Staphylococcus epidermidis	9 (39.13)
Staphylococcus aureus	7 (30.43)
Streptococcus dysgalactiae	3 (13.04)
Streptococcus agalactiae	3 (13.04)
Diphtheroids	1(04.34)

Mixed infections were observed in 2 quarters

the predominant mastitogenic agent followed by *Streptococcus* spp. (26.08%) and diphtheroids (4.34%). Almost similar results have been reported by Sharma and Kapur (2000). However, organisms like *E. coli, Pseudomonas* spp. and *Corynebacterium* spp. were not recorded in the present study. Kalorey *et al.* (1983), Tijare *et al.* (1999), Sharma and Kapur (2000) and Saxena (2000) reported higher prevalence of *Streptococci* than the other mastitogenic organisms. Of the 16 *Staphylococcus* organisms isolated from 21 quarter milk samples in the present study, *S. epidermidis* and *S. aureus* were 39.13 and 30.43%, respectively. These findings were in conjunction with the findings of Dhakal (1988) and Saxena (2000). Contrary to this, Kapur and Singh (1978), Chaudhary *et al.* (1982), Saini *et al.* (1994) and Shrirame *et al.* (1997) reported higher prevalence of *S. aureus* than *S. epidermidis*. Amongst *Streptococci* isolates, *S. agalactiae* and *S. dysgalactiae* were 13.04% each. Wahbay and Hilmy (1946) reported a higher incidence of *S. agalactiae* (45.00%), whereas a higher incidence of S. dysgalactiae (30.70%) has been reported by Kalra and Dhanda (1964) and Dhanda and Sethi (1962). In the present investigation, diphtheroids were isolated in 4.34% SCM samples. Whereas a higher incidence of diphtheroids (8.64%) have been reported by Sharma and Kapur (2000). Several other workers (Paranjape and Das, 1986, Ahmad *et al.*, 1991 and Naiknaware *et al.*, 1998) could not isolate diphtheroid organisms from SCM cases. In the present study, mixed infection of *Staphylococcus* spp. and *Streptococcus* spp. was encountered only in 9.52% quarters which is similar to the finding of Sharma and Kapur (2000) who reported 10.00% prevalence of mixed infection. However, Misra *et al.* (1973) reported a higher incidence (36.10%) of the quarters harboring mixed infections.

REFERENCES

Ahmad, R., Javaid, S. and Lateef, M. (1991). Studies on prevalence, etiology and diagnosis of subclinical mastitis in dairy animals. *Pakistan Vet. J.* **11**: 138-140.

Anonymous, National Mastitis Council (1998). Current concept of bovine mastitis. USA, pp. 37.

Brown, R.W., Barnum, D.A., Mc Donald , J.S. and Schultze, W.B. (1981). Microbiological procedures for use in the diagnosis of bovine mastitis. National Mastitis Council. Inc. Arting Ton V.D pp. 10-16.

Chaudhary, Z.I. Khan, J.M. and Basra, M.A. (1982). Studies on the staphylococcus mastitis in buffaloes. *Pakistan J. Sci. Res.* **34**: 79-84.

Dahiya, B.S. and Kapur, M.P. (1984). Bacteriological examination and therapeutic trials with the cloxacillin sodium in clinical cases of mastitis. *Indian J. Vet. Med.* **4**: 1-4.

Dhakal, I.P. (1988). Studies on some aspect of diagnosis of subclinical mastitis in buffaloes. M.V.Sc. thesis, CCS Haryana Agricultural University, Hisar.

Dhakal, I.P. and Kapur, M.P. (1992). Prevalence of subclinical and latent mastitis in buffaloes as detected by somatic cell count, California mastitis test and cultural examination using fractioned milk. *Indian Vet. Med.* **13**: 70-71.

Dhanda, M.R. and Sethi, M.S. (1962). Investigations of mastitis in India. Indian Council Agric. Res. Ser. No. 35.

Kalorey, D.R., Purohit, J.H and Dholakia, P.M. (1983). Studies on the incidence of sub-clinical, mastitis, its etiology and *In- vitro* sensitivity of isolates. *Indian J. Anim. Sci.* **53**: 961-963.

Kalra, D.S. and Dhanda, M.R. (1964). Incidence of mastitis in cows and buffaloes in north west India. *Vet. Rec.* **76**: 219-222.

Kapur, M.P. and Singh, R.P. (1978). Studies on clinical cases of mastitis in cows, buffaloes and goats in Haryana state. *Indian Vet. J.* **55**: 803-806.

Mattila, T. and Sandholm, M. (1985). Antitrypsin and N-acetyl-β-D-glucosaminidase as markers of mastitis in a herd of Ayshire cows. *Am. J. Vet. Res.* **46**: 2453-2456.

Misra, P.K., Panda, S.N. and Misra, S.K. (1973). Incidence and etiology of sub-clinical bovine mastitis in Orissa. *Indian J. Anim. Hlth.* **12** : 175-180.

Naiknaware, H.S., Shelke, D.D. Bhalerao, D.P, Keshkar, D.V., Jagdish, S. and Sharma, L.K. (1998). Prevalence of subclinical mastitis in buffaloes in Mumbai. *Indian Vet. J.* **75** :291-292.

Paranjape, V.L. and Das, A.M. (1986). Mastitis among buffalo population of Bombay-a bacteriological report. *Indian Vet. J.* **63** : 438-441.

Roder, R. and Gedek, W. (1986). Milk cell count associated with diffenent mastitic pathogens. *Berl. Much. tierztl.*

wochr. **99**: 73-76 (abstr. *Vet. Bull.* 56:8).

Said, A.H. and Abd. El-Malek, A.S. (1968). Diagnosis, incidence and treatment of sub-clinical mastitis in dairy buffaloes. *J. Vet. Sci.* UAR **5**: 171-181.

Saini, S.S., Sharma, J.K. and Kwatra, M.S. (1994). Prevalence and etiology of sub-clinical mastitis among cross bred cows and buffaloes in Punjab. *Indian J. Dairy Sci.* **47**: 103-106.

Salsberg, E., Meek, A.H. and Marlin, S.W. (1984). Somatic cell counts associated factors and relationship to production. *Can. J. Comp. Med.* **48**: 251-257.

Saxena, V. (2000). Studies on prevalence, detection and control of subclinical mastitis in buffaloes. M.V.Sc. thesis, CCSHAU, Hisar.

Schalm, O.W. and Lasmanis, J. (1968). The leucocytes: origin and function in mastitis. *J. Am. Vet. Med. Assoc.* **153**: 1688-1694.

Schalm, O.W., Carroll, E.J. and Jain, N.C. (1971). Bovine mastitis. Lea and Febiger, Philadelphia.

Schultz, L.H., Brown, R.W., Jasper, D.E. Mellenberger, R.W., Natzke, R.P., Philpot, W.N., Smith, J.W. and Thompson, P.D. (1978). Current concept of bovine mastitis. (2nd. Edn). National Mastitis Counc. Inc. Arlington, V.A.

Sharma, Anshu and Kapur, M.P. (2000). Prevalence of subclinical mastitis in buffaloes. VIth Annual Conference, IAAVR, 2000, Izatnagar India, pp. 8-11.

Shrirame, K.R., Kalorey, D.R. and Harne, S.D. (1997).Studies on subclinical mastitis in buffaloes: prevalence, etiology and antibiogram of the isolates. *Indian J. Comp. Microbiol. Immunol. Infect. Dis.* **18**: 87-89.

Singh, N., Sharma, V.K., Rajani, H.B. and Sinha, Y.R. (1982). Incidence, economy and test efficacy of sub-clinical mastitis in dairy animals. *Indian Vet. J.* **59**: 693-696.

Tijare, D.B. Singh, A.K., Chaturvedi, V.K. and Dhanesar, N.S. (1999). Sensitivity of indirect tests in detection of subclinical mastitis in buffaloes. *Indian Vet. J.* **76**: 912-915.

Tolla, V. and Cabeli, P. (1985). Somatic cell count in milk of cows. *Buletini ishkencave, zooteknikee Veterinare* **1**: 93-104 (abstr. *Vet. Bull.* 55:6105).

Tolle, A. (1975). Mastitis the disease in relation to control methods. Proc. IDF Seminar on mastitis control. Reading Univ., April 7-11, pp. 4.

Tuteja, F.C. (1999). Studies on mastitis in buffaloes with special reference to serum selenium status and control by treating teat canal infections. Ph.D. thesis, CCSHAU, Hisar

Wahby, A.M. and Hilmy, N. (1946). *J. Comp. Path.* **56**:246-253. (Cited by Mohan, R.N., 1988, Disease and parasites of buffaloes. *Vet. Bull.* **38**: 647-659.