

PREVALENCE OF SUB CLINICAL MASTITIS (SCM) IN SHE BUFFALOES  
AT SURAJPUR DISTRICT OF CHHATTISHGARH, INDIA

Deepak Kumar Kashyap, Devesh Kumar Giri and Govina Dewangan\*

ABSTRACT

Present investigation was carried out on randomly selected 120 she buffaloes in dairy farms and local farmers of different places, villages of Surajpur, with the objective to study the prevalence of subclinical mastitis in she buffaloes at adjoining areas of Surajpur. The prevalence of the subclinical mastitis was studied by screening of she buffaloes correlated with age, breed, stage of lactation and quarter wise distribution. The overall prevalence rate was 68.33%. The rate of prevalence of SCM was the highest between the age group of 9 and 11 years (90.32%). Breed wise prevalence of SCM was found maximum in crossbred (72.30%) followed by indigenous (65.62%) and nondescript (47.23%) breed. The prevalence of SCM was found to be the highest in mid lactation (76.47%) followed by early (67.27%) and late (61.29%) lactation. Quarter wise study revealed that the left hind quarters (30.83%) were found to be the most prone for sub clinical infection followed by right fore (19.16%), left fore (10%) and the least affected was right hind quarter (8.33%).

**Keywords:** *Bubalus bubalis*, buffaloes, prevalence, sub clinical mastitis, she buffaloes

INTRODUCTION

India is one of the leading milk producing countries in the world. Dairy animal rearing plays an important role in income generation by providing self-employment. Dairy development by cooperative society brought socioeconomic transformation in innumerable small and marginal dairy farmers. Mastitis is identified worldwide as costlier disease of dairy animals because it causes economic losses due to reduction in milk production, increase culling rate, altered milk quality and cost of treatment (Rodostits *et al.*, 2007). Mastitis is globally acknowledged as one of the most important diseases of dairy industry. The direct losses include treatment cost, mortalities, discarded milk, herdsman's time, cost associated with repeated mastitis. The economic loss due to subclinical mastitis higher than the acute mastitis in buffaloes (Singh and Singh, 1994; Dua, 2001). Clinical and subclinical mastitis (SCM) estimated in buffalo and found most economically important diseases of milking animals.

Due to disease, changes in glandular tissues occurs which affecting quality as well as quantity of the milk Nagahata *et al.* (1992); Sharma and Sindhu, (2007). Bansal *et al.* (2014). Rambabu *et al.* (2011) suggested that the diseases

of the udder and teat are common problems in buffaloes and diseases affect the productivity and the farmers economy. The udder and teats are more prone to external trauma or injury because of their anatomical location which is near to the ground surface and away from the body, increase in size of udder and teats during lactation and last term of pregnancy, inappropriate methods of milking, repeated trauma to the teat mucosa, injury by teeth of calves during sucking, accidentally stepped on teat, paralysis resulting from metabolic disturbances at parturition (Tiwary *et al.*, 2005). In addition, congenital anomalies of the udder and teats may preclude or interfere with milk outflow and may predispose to mastitis (Abdel Hady, 1993).

Sometimes udder and teats showed presence of bacteria and other infectious agents which may be harmful to humans after consumption of infected milk followed by mastitis therapy leads to presence of antibiotic residues in milk rendering it unsuitable for human consumption or further processing (Costa *et al.*, 1997). Moroni *et al.* (2006) found that the animals highly susceptible to infection during the periparturient period, the incidence was high during the 30 days post parturition. The present research work highlighted with objectives of record the prevalence of subclinical mastitis in she buffalo in adjoining areas of Surajpur district of Chhattisgarh.

## **MATERIALS AND METHODS**

The present study was carried out on 120 lactating she buffaloes of nondescript, cross and indigenous breeds of different places under different phases of lactation in Surajpur district of Chhattisgarh. The detailed information was collected regarding age, breed, stage of lactation

and other relevant information for the present study by the way of anamnesis and physical examinations.

### **Selection of cows**

All she buffaloes in the dairy farms were examined physically and clinically during milking for the confirmation of any abnormality other than the sub clinical mastitis. Subsequently, age, breed, stage of lactation etc. recorded before initiation of the study.

### **Anamnesis and general examination**

A descriptive data was obtained from the animal owner regarding age, breed, stage of lactation etc. and all animals were individually examined for variation in temperature, pulse and respiration rate.

### **Physical examination of the mammary region**

Physical examination of udder and teats was done by gross examination followed by palpation to check the udder asymmetry, teat size, shape, milk flow, consistency and other inflammatory signs.

### **Control of animal**

Most of the animals were cooperative and controlled by animal owner but some animals were aggressive in behaviour. Hence those type of animals was controlled by physical restraint by using cotton rope (Milkers knot), travis, casting over the well padded bedding etc.

### **Prevalence of subclinical mastitis**

The number of affected animals regarding subclinical mastitis was calculated on the basis of age, breed, quarter involvement and stage of lactation.

**Age**

The prevalence of subclinical mastitis in different age groups of lactating she buffaloes ranging from 3 to 14 years was included in this study.

**Breed**

The prevalence of subclinical mastitis was also studied in different breeds (nondescript, crossbred and indigenous) of lactating she buffaloes reared in different farms and houses.

**Stage of lactation**

The lactating she buffaloes were also grouped into three categories for study of lactation stage wise prevalence *viz.* early lactation *i.e.* first 3 months of lactation, mid lactation (4<sup>th</sup> to 6<sup>th</sup> months of lactation) and late lactation (last 3 months of lactation).

**Quarter-wise prevalence**

Quarter wise prevalence of subclinical mastitis was also recorded of all quarters (Left fore, Left hind, Right fore and Right hind) in lactating she buffaloes.

**Statistical analysis**

The mean and standard error of the recorded value was calculated. The data was analyzed statistically by using ANOVA using one way analysis of variance followed by DMRT (Duncan's multiple range test) after suitable transformation as per the procedure outlined by Snedecor and Cochran (1994) using SPSS 20 version.

**RESULTS AND DISCUSSION**

Prevalence of sub clinical mastitis and its relation with age, breed, stage of lactation and quarter wise distribution in she buffaloes.

**Overall prevalence**

Prevalence of sub clinical mastitis in she buffaloes in organized dairy farms was made on the basis of history, physical and clinical examination of the teat and udder. A total of 120 she buffaloes from animal house, dairy farms of different breeds were screened for the study of sub clinical mastitis, out of which 82 she buffaloes were found to be positive for sub clinical mastitis indicating an overall prevalence of 68.33% in the area (Table 1).

Similar findings were made by the work of Omer (1973); Rambabhu *et al.* (2011); Dhakal (2006); Shrinivasan *et al.* (2013) who calculated that the 54 (26.21%) out of 206 buffaloes was affected with sub clinical mastitis (SCM). However, Lisie *et al.* (2008) suggested that different types of deficiencies predispose to udder oedema, teat and udder injury and mastitis. During present study, observed that most of the animal place was not suitable for milking and also the milkers not followed the proper methods and way of clean milk production. This was the most important cause of increase prevalence rate in the study. El-Naker *et al.* (2015) also postulated that the prevalence of intramammary infection in buffalo was 66% which was more than present study.

**Age wise prevalence**

It was calculated that during the course of study that 90.32% she buffaloes of age group 9 to 11 years, 77.27% in 12 to 14 years, 65.78% in 6 to 8 years and 41.37% in 3 to 5 years were positive for sub clinical mastitis (Table 2).

During the present study prevalence rate of sub clinical mastitis (SCM) was found to be the highest between the age group of 9 to 11 years. This trend of advancing of age and increased susceptibility to sub clinical mastitis might be due to increased milk production, the udder becomes pendulous which are susceptible to injuries and the immunity of the animal gradually decreases with the older age. Damaged protective barrier of the teat sphincter or orifice leads to entry of bacteria. The findings of our study was similar with the findings of Radostits *et al.* (2007) and Matei (2011) who have also mentioned that the prevalence of mastitis increased with the advancement of age.

#### **Breed wise prevalence**

During the present study the susceptibility of sub clinical mastitis was also correlated to the breeds of she buffaloes. Crossbred she buffaloes (72.30%) were more susceptible to mastitis due to their high milk production followed by indigenous (65.62%) and nondescript she buffaloes (47.23%) found relatively more resistant to infection (Table 3).

The present study showed that the crossbred she buffaloes were more susceptible than other breeds of she buffaloes which might be due of reduced immunity due to milking stress. The present result supported by the work of Shrinivasan *et al.* (2013) who isolated that the 54 (26.21%) out of 206 buffaloes was affected with sub clinical mastitis where different breeds of grades murrhah, graded surati and nondescript showed 15.33%, 5.83% and 4.85 positivity to subclinical mastitis, respectively.

#### **Prevalence with respect to stage of lactation**

Data pertaining to rate of prevalence of sub clinical mastitis with respect to stage of

lactation are presented in Table 4. The prevalence of sub clinical mastitis was the highest in mid stage of lactation (76.47%) followed by early lactation (67.27%) and late lactation (61.29%).

The findings of present study emphasised that high prevalence of sub clinical mastitis in mid stage of lactation which might be due to physiological stress of high milk yield and alteration in the homeostatic mechanism. Furthermore, it could also be attributed to the production stress on udder which may increase the pressure within the mammary gland which causes broadening of teat canal and teat sphincter (Lakshmirani *et al.*, 2008). However, the present observation is in contrary to the findings of El-Naker *et al.* (2015) who found the prevalence of subclinical mastitis was 17.44%, 19.29% and 44.44% in early, mid and late stages of lactation respectively whereas Palanivel *et al.* (2005) found the higher incidence of subclinical mastitis during early (70.80%) and low in late (36.8%). Some researchers like Moroni *et al.* (2006); Kavitha *et al.* (2009) also concluded that, She buffaloes in the first stage of lactation (1 to 4 months) and the last part of dry period (10 to 12 months) are found more favourable to mastitis.

#### **Quarter wise prevalence**

Table 5 and Figure 1 depicts the quarter wise prevalence of SCM in she buffaloes which was 68.33%. Among the quarters tested and found positive the left hind (LH) quarter was found to be the most susceptible giving prevalence of 30.83% followed by RF (19.16%), LF (10%) and RH (8.33%).

The findings of present study also revealed that SCM was more prevalent on the hind quarters as compared to the fore quarters and SCM was higher in left quarters in comparison to right quarters. This might be due to anatomical location of hind quarters are relatively more in direct contact with

excreta i.e. dung and urine, large capacity in mass and more pendulous as compare to fore quarters, close contact with floor of milking area or barn which predispose the high risk to teat injury of hind quarters than fore quarters. These present finding was appreciated with findings of Shrinivasan *et al.* (2013) who reported that prevalence of subclinical mastitis in LF, LH, RF and RH quarters were 12 (11.11%), 50 (46.30%), 6 (5.5%) and 40 (37.04%) respectively. There was higher prevalence in hind quarters and among which left one (46.30) was found to be more susceptible. Naiknaware *et al.* (1998) and Chisty *et al.* (2007) explained that hind quarters are more prone to subclinical mastitis. The higher prevalence in hind quarters may be due to their frequent exposure to dung and urine. Sometimes during milking the quarters are pulled forward and sideways which may lead to unusual stress over them Shrinivasan *et al.* (2013).

The present study indicated that among the total infected animals, the percentage of single quarter infection was 51.21% while double, triple and quadruple quarter infection was recorded to be 15.85%, 14.63% and 18.29% respectively (Table 6) and Figure 2 and Figure 3. The findings of present study are in agreement with the findings of Saini *et al.* (1994) who recorded a single quarter involvement with sub clinical mastitis in she buffaloes.

The reason for difference in quarter wise prevalence might be due to lack of proper hygiene in the milking premises, milking methods, common milkers or having cuts on their hands, use of common cloths for wiping the udder which could be source for spread of mastitis.

The prevalence study on subclinical mastitis in districts of Chhattisgarh in specially in buffaloes are very less including some states of India, where needs these type of study. Shrinivasan

*et al.* (2013) also stated that limited information regarding the prevalence and etiology of subclinical mastitis in clinically normal buffaloes in Nammakal distirct of Tamilnadu.

## CONCLUSION

It was concluded that a higher overall prevalence (68.33%) of subclinical mastitis was recorded on different animal house and dairy farms in and around Surajpur district. The prevalence of subclinical mastitis was found higher in crossbred as compare to indigenous and nondescript breeds. The condition increased with the advancement of age and was found to be highest between the age group of 9 to 11 years and afterwards it showed a declining trend and the prevalence of subclinical mastitis was the highest in mid stage of lactation followed by early and late lactation. Left hind quarters were more prone to subclinical mastitis and the least affected was right hind quarters.

## REFERENCES

- Abdel Hady, A.A.A. 1993. *Studies on the surgical udder and teat affections in dairy farms*. M.V. Sc. Thesis, Cairo University, Egypt.
- Bansal, B.K., D.K. Gupta, T.A. Shafi and S. Sharma. 2014. Comparative antibiogram of coagulase-negative Staphylococci associated with subclinical and clinical mastitis in dairy she buffaloes. *Veterinary World*, **8**: 421-426.
- Chisty, M.A., M. Arsad, M. Avais, S. Hameed and M. Ijay. 2007. Cross-sectional and epidemiological studies on mastitis in cattle and buffaloes at Tehsil Gojra, Pakistan.



Figure 1. The affected left hind quarter.



Figure 2. Showing double quarters involvement.

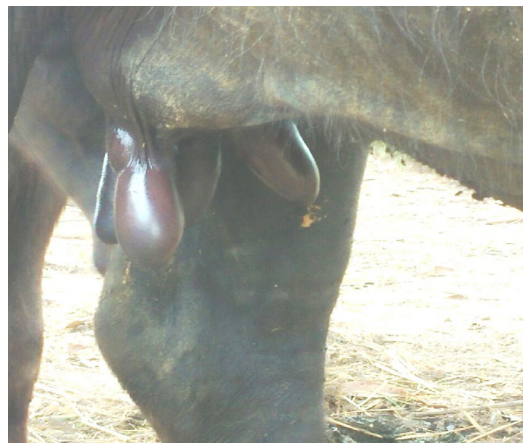


Figure 3. Showing affected multiple quarters.

Table 1. Overall prevalence of sub clinical mastitis in she buffaloes.

| District total | no. of cow | Total no. of positive | Prevalence examined for SCM (%) |
|----------------|------------|-----------------------|---------------------------------|
| Surajpur       | 120        | 82                    | 68.33                           |

Table 2. Age wise prevalence of sub clinical mastitis in she buffaloes.

| Age group | No. of she buffaloes | No. of positive cases | Prevalence (%) (in year examined) |
|-----------|----------------------|-----------------------|-----------------------------------|
| 3-5       | 29                   | 12                    | 41.37                             |
| 6-8       | 38                   | 25                    | 65.78                             |
| 9-11      | 31                   | 28                    | 90.32                             |
| 12-14     | 22                   | 17                    | 77.27                             |
| total     | 120                  | 82                    | -                                 |

Table 3. Breed wise prevalence of sub clinical mastitis in she buffaloes.

| Breed       | No. of she buffaloes | Positive for SCM | Prevalence (%) |
|-------------|----------------------|------------------|----------------|
| Nondescript | 23                   | 11               | 47.23          |
| Crossbred   | 65                   | 47               | 72.30          |
| Indigenous  | 32                   | 21               | 65.62          |
| Total       | 120                  | 82               | -              |

Table 4. Prevalence of subclinical mastitis in different stages of lactation in she buffaloes.

| Stage of lactation | No. of she buffaloes examined | No. of positive for SCM | Prevalence (%) |
|--------------------|-------------------------------|-------------------------|----------------|
| Early              | 55                            | 37                      | 67.27          |
| Mid                | 34                            | 26                      | 76.47          |
| Late               | 31                            | 19                      | 61.29          |
| Total              | 120                           | 82                      | -              |

Table 5. Quarter wise prevalence of sub clinical mastitis in she buffaloes.

| Parameters                            | No. of animals | Quarter wise distribution |       |       |      |
|---------------------------------------|----------------|---------------------------|-------|-------|------|
|                                       |                | LF                        | LH    | RF    | RH   |
| No. of she buffaloes Examined         | 120            | 120                       | 120   | 120   | 120  |
| No. of she buffaloes Positive for SCM | 82             | 12                        | 37    | 23    | 10   |
| Prevalence (%)                        | 68.33          | 10                        | 30.83 | 19.16 | 8.33 |

Table 6. Distribution of single and multiple quarter involvement in subclinical mastitis in she buffaloes.

| Infected quarters | No. of infected animals | Prevalence (%) |
|-------------------|-------------------------|----------------|
| Single quarter    | 42                      | 51.21          |
| Double quarter    | 13                      | 15.85          |
| Triple quarter    | 12                      | 14.63          |
| Quadruple quarter | 15                      | 18.29          |
| Total             | 82                      | -              |

- Buffalo Bull.*, **26**: 50-55.
- Costa, E.O., F. Garino., Jr.E.T. Ribeiro, V.P. Watanabe, P.S. Baruselli and A. Paske. 1997. Study of mastitis among ten dairy buffaloes herds (*Bubalus bubalis*) in the Vale do Ribeira (Ribeira River Valley) Sao Paulo. Brazil, p. 635-638. *In The Proceedings 5<sup>th</sup> World Buffalo Congress*, Caserta, Italy.
- Dhakal, I.P. 2006. Normal somatic cell count and subclinical mastitis in Murrah buffaloes. *J. Vet. Med. Ser. B.*, **53**: 81-86.
- Dua, K. 2001. Incidence, etiology and estimated economic losses due to mastitis in Punjab and in India - An update. *Indian Dairyman*, **53**: 329-333.
- EL-Naker, Y.F., M. Sayed-Ahmed, Z. Saad, E. Reiad and E.E. Younis. 2015. Prevalence of buffalo mastitis in Dakahlia governorate. *Assiut Vet. Med. J.*, **61**(145): 32-39.
- Kavitha, K.L., K. Rajesh, K. Suresh, K. Satheesh and N.S. Sundar. 2009. Buffalo mastitis - Risk factors. *Buffalo Bull.*, **28**: 135-137.
- Lakshmirani, N., M. Shrinivas, K. Suresh and M. Sreenu. 2008. An epidemiological study of mastitis in buffaloes. *Indian Vet. J.*, **85**: 1350-1351.
- George, L.W., T.J. Divers, N. Ducharme and F.L. Welcome. 2008. Diseases of the teats and udder, p. 335. *In Divers, T.J., S.F. Peek (eds.)* *Rebhuns Disease of Dairy Cattle*, 2<sup>nd</sup> ed., Saunders-Elsevier Publishers, St. Louis, USA.
- Matei, S.T. 2011. *Laboratory methods used for subclinical mastitis diagnosis in cattle*. Ph.D. Thesis, University of Agricultural Science and Veterinary Medicine, Cluj-Napoca, Paris, France.
- Moroni, P., C.S. Rossi, G. Pisoni, V. Bronzo, B. Castiglioni and P.J. Boettcher. 2006. Relationships between somatic cell count and intramammary infection in buffaloes. *J. Dairy Sci.*, **89**(3): 998-1003.
- Nagahata, H., A. Ogawa, Y. Sanada, H. Noda and S. Yamamoto. 1992. Peripartum changes in antibody producing capability of lymphocytes from dairy cows. *Vet. Quart.*, **14**: 39-40.
- Naiknaware, H.S., D.D. Shelte, D.P. Bhalerao, D.V. Koskaetr, S. Jagades and L.K. Sharma. 1998. Prevalence of subclinical mastitis in buffaloes in and around Mumbai. *Indian Vet. J.*, **75**: 291-292.
- Omar, M.S.A. 1973. *Surgical affections of the buffalo udder*. M.V.Sc. Thesis, Faculty of Veterinary Medicine, Cairo University, Egypt.
- Palanivel, K.M., R. Thangathurai and P.I. Ganesan. 2005. Prevalence of subclinical mastitis in



- buffaloes in and around Chennai (Madras). *Buffalo. J.*, **21**: 127-133.
- Radostits, O.M., C.C. Gay, K.W. Hinchcliff and P.P. Constable. 2007. *Veterinary Medicine. A textbook of the Diseases of Cattle, Horses, Sheep, Pigs and Goats*, 10<sup>th</sup> ed. W.B. Saunders Publication, China.
- Rambabu, K., M. Sreenu, R.V. Suresh Kumar and T.S.C. Rao. 2011. Incidence of udder and teat affections in buffaloes. *Tamilnadu Journal Veterinary and Animal Sciences*, **7**(6): 309-311.
- Sharma, A. and N. Sindhu. 2007. Occurrence of clinical and subclinical mastitis in buffaloes in the State of Haryana (India). *Ital. J. Anim. Sci.*, **6**(2): 965-967.
- Snedecor, G.W. and W.G. Cochran. 1994. *Statistical methods*. Iowa State University Press, Ames, Iowa, USA.
- Saini, S.S., J.K. Sharma and M.S. Kwatra. 1994. Prevalence of etiology of subclinical mastitis among cows and buffaloes in Punjab. *Indian J. Dairy Sci.*, **47**: 103-106.
- Singh, P.J. and P.B. Singh. 1994. Study of economic losses due to mastitis in India. *Indian J. Dairy Sci.*, **47**: 265-272.
- Srinivasan, P., D. Jagadeswaran, R. Manoharan, T. Giri, G.A. Balasubramaniam and P. Balachandran. 2013. Prevalence and etiology of subclinical mastitis among buffaloes (*Bubalus bubalus*) in Namakkal, India. *Pakistan Journal of Biological Sciences*, **16**(23): 1176-1780.
- Tiwarly, R., M. Hoque, B. Kumar and P. Kumar. 2005. Surgical condition of udder and teats in cows. *The Indian Cow*, 25-27.