PREVALENCE OF BOVINE SUBCLINICAL MASTITIS IN MAHENDERGARH AND REWARI DISTRICTS OF SOUTH HARYANA

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ABSTRACT

Modified Whiteside Test (MWT) was applied for detection of subclinical mastitis (SCM) on milk samples from 1960 quarters of 490 apparently healthy lactating dairy animals of Mahendergarh and Rewari districts of Haryana state. Overall prevalence of SCM was observed higher in cow (38.33%) as compared to buffaloes (16.32%). Quarter wise prevalence of the disease was also higher in cow (19.67%) than buffaloes (7.76%). The prevalence of the SCM was highest in 6-8 years of age group of cow and buffaloes (46.24% and 19.35%), 1st to 3rd lactation (40.15% and 18.18%) and during first two months after calving (45.98% and 21.57%), respectively. Maximum number of cows and buffaloes (54.78% and 48.39%) were found positive with one quarter milk sample with higher prevalence in left quarters (55.65% and 54.84%) and hind quarters (52.17% and 51.61%), respectively.

Key words: Buffalo, Cow, MWT, Prevalence, SCM

Mastitis is a global problem in dairy animals that adversely affects animal health, quality of milk and economics of milk production leading to huge financial losses (Sharma *et al.*, 2004). Apart from economic importance, it also carries public health concerns due to drug residue in milk and transmission of pathogenic organisms to human population and subclinically affected animals remain a continuous source of infection to other herd mates too. The subclinical mastitis (SCM) is a more serious problem and responsible for much greater loss to the dairy industry (Kader *et al.*, 2002). In India, economic losses due to subclinical mastitis in buffaloes is estimated to be cost of Rs. 1723.32 crores as compared to Rs. 696.29 crores due to clinical form of the disease (Dua, 2001). Considering the quantum of economic losses and public health importance, early detection and adoption of therapeutic measures by veterinary practitioners and livestock farmers for subclinical mastitis in dairy animals are very essential. Cases of subclinical mastitis are neither readily detectable by manual palpation of glands nor by visual examination of the milk. Because of the large numbers of subclinical cases, the diagnosis of mastitis depends largely on indirect tests that rely on the leukocyte content which increased significantly in the milk of affected glands (Radostits *et al.*, 2000). Therefore, the present study was undertaken to know the prevalence rate of subclinical mastitis (SCM) using Modified Whiteside Test (MWT) in dairy animals of Mahendergarh and Rewari districts of south Haryana (India).

MATERIALS AND METHODS

The study was conducted on 1960 quarter milk

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samples of 490 apparently healthy lactating dairy animals consisting of 300 Holstein Friesian cross bred and Jersey cross bred dairy cows and 190 Murrah and graded Murrah buffaloes. Animals for the study were selected randomly in field conditions from some dairy herds and individual farmers of Mahendergarh and Rewari districts of south Haryana. Milk samples from all the four quarters of these animals were collected aseptically as described by Quinn *et al.* (2004) by washing the teats, drying and sterilized with cotton soaked in 70 percent ethyl alcohol. Mastitic milk samples showed a varying degree of precipitation and clumping reaction during stirring depending upon the severity of mastitis due to presence of leucocytes. Depending on the degree of precipitation and clumping, readings of positive test were categorised as mild (+), moderate (++), high (+++) and very high (++++) positive, respectively. During milk collection, data regarding age, number of lactation and lactation status of such animals were also collected from their owners. The prevalence of SCM was calculated according to animal species, age, number of lactation, lactation stage, number of quarter(s) affected and anatomical position of quarter(s) affected.

RESULTS AND DISCUSSION

Overall prevalence of SCM (Table 1) was higher in cow (38.33%) as compared to buffaloes (16.32%) and also quarter wise prevalence of disease was higher in cow (19.67%) than buffaloes (7.76%). The observations are in agreement with Khan and Muhammad (2005) and Swami *et al.* (2017). This difference may be attributed to the tighter teat sphincter of buffaloes as compared to that of cow (Uppal *et al.*, 1994).

Numbers / Species	Cow	Buffalo
No. of animals examined	300	190
No. of animals found positive	115	31
Percentage	38.33%	16.32%
No. of quarters examined	1200	760
No. of quarters found positive	236	59
Percentage	19.67%	7.76%

Cow

Prevalence of SCM in cow was 38.33%, and 19.67% out of 1200 quarter milk samples reacted positive by MWT (Table 1). Wide variation (27.50- 70.37%) in prevalence of SCM in crossbred cows in different geographical and climatic areas has been observed by various workers (Maiti *et al.*, 2003; Islam *et al.*, 2011; Sri Balaji and Saravanan, 2017). Similarly, quarter wise prevalence ranging from 22.50% to 47.50% has been reported by Supriya *et al.* (2010) and Sri Balaji and Saravanan (2017), respectively. Certain conditions like areas under shade trees, poorly drained ground surfaces, pond and muddy areas might result in a high rate of exposure of udder to the pathogens (Radostits *et al.*, 2000). Lower prevalence of SCM in our study may be due to extreme arid to semi-arid climatic conditions of the study area. Age wise prevalence of the SCM (Table 2) was higher in the age group of 6-8 years (46.24%) and 8-10 years (45.35%) followed by 10-12 years (28.81%) and 4-6 years (25.81%) which is in agreement with the findings of Islam *et al.* (2011). Lactation wise,

higher prevalence was observed in 1st to 3rd lactation (40.15%) followed by 4th to 6th lactation (39.20%) and 7th to 9th lactation (30.23%), respectively (Table 2). Similar observations were reported by Islam et al. (2011) with 28.57%, 36.84% and 47.05% prevalence inparity numbers 1st, 2nd and 3rd, respectively. Lactation stage wise, prevalence of the disease (Table 2) was higher (45.98% and 44.09%) during first two months and 2-4 months after calving, and followed by 41.38% at >8 months, 25.64% at 6-8 months and 23.07% at 4-6 months, respectively. Our findings were similar to that of Islam *et al.* (2011) who recorded 45.83%, 31.58% and 33.33% prevalence during early, mid and late stages of lactation, respectively. Sixty three (54.78%) of 115 cows had SCM in one quarter (Table 3) followed by two quarters (24/115; 20.87%), three quarters (18/115; 15.65%) and all the four quarters (10/115; 8.69%). Occurrence of SCM was also influenced by the anatomical position of quarters as presented in table 3, where prevalence was higher in left quarters (55.65%) as compared to right one (44.35%) and hind quarters (52.17%) were more affected than fore quarters (47.83%). Similar results have also been reported by Mustafa *et al.* (2013) and Sharma *et al.* (2016).This may be due to hand milking carried out mostly by knuckling method using thumb pressure and sitting on the left side of animal, therefore, there are chances of application of more pressure during milking on left quarters.

Buffalo

A total of 31 (16.32%) out of 190 buffaloes and 59 (7.76%) in 760 quarter milk samples reacted positive for

Table 2
Age, No. of lactation and lactation stage wise prevalence of subclinical mastitis.

Parameters		Cow			Buffalo		
		No. of animals examined	No. of positive animals	Percentage	No. of animals examined	No. of positive animals	Percentage
Age group (Years)	4 – 6	62	16	25.81	38	06	15.79
	6 – 8	93	43	46.24	62	12	19.35
	8 – 10	86	39	45.35	59	09	15.25
	10 – 12	59	17	28.81	31	04	12.90
	Total	300	115	38.33	190	31	16.32
No. of lactation	1 – 3	132	53	40.15	88	16	18.18
	4 – 6	125	49	39.20	80	12	15.00
	7 – 9	43	13	30.23	22	03	13.64
	Total	300	115	38.33	190	31	16.32
Lactation stage (Months)	0 – 2	87	40	45.98	51	11	21.57
	2 – 4	93	41	44.09	57	12	21.05
	4 – 6	52	12	23.07	38	03	7.89
	6 – 8	39	10	25.64	26	02	7.69
	>8	29	12	41.38	18	03	16.67
	Total	300	115	38.33	190	31	16.32

Table 3
Quarter(s) wise prevalence of subclinical mastitis.

Parameters		Cow(115)*		Buffalo (31)*	
		No. of positive quarter(s)	Percentage	No. of positive quarter(s)	Percentage
No. of quarter(s) involved	One quarter	63	54.78	15	48.39
	Two quarters	24	20.87	06	19.35
	Three quarters	18	15.65	05	16.13
	Four quarters	10	8.69	05	16.13
Anatomical position of quarter(s) involved	Left quarter(s)	64	55.65	17	54.84
	Right quarter(s)	51	44.35	14	45.16
	Fore quarter(s)	55	47.83	15	48.39
	Hind quarter(s)	60	52.17	16	51.61

*Figure in parenthesis represents number of animals reacting positive for subclinical mastitis.

SCM by MWT (Table 1). Comparatively higher prevalence of SCM (28.33% to 70.32%) in buffaloes has been reported by earlier workers (Sharma *et al.*, 2004, Swami *et al.*, 2017). Quarterwise prevalence in the tune of 38.99% was recorded by Sharma *et al.* (2007). Such differences in findings may be due to varying degree of susceptibility in different breeds of animals, types of animal husbandry practices followed by farmers, geographical and climatic conditions in different areas and different indirect tests adopted for detection of SCM. Highest prevalence (19.35%) was recorded in 6-8 years of age group (Table 2), when the animals are in stage of their peak milk production, followed by 4-6 years (15.79%), 8-10 years (15.25%) and lowest in 10-12 years (12.90%). The results corroborate with Sharma *et al.* (2007) who found highest prevalence of SCM in 3 to 9 years of age group. Highest prevalence was reported in animals (Table 2) which were in their 1st to 3rd lactation (18.18%) followed by 4th to 6th (15%) and 7th to 9th (13.64%) lactation, respectively. This is in agreement with Kumar and Sharma (2002), who recorded majority of cases during 3rd lactation. As far as the stage of lactation (Table 2) is concerned, prevalence was more (21.57%) during first two months post partum (early lactation) followed by 2-4 months (21.05%), 4-6 months (7.89%) and 6-8 months (7.69%), but it was again recorded on higher side (16.67%) in the animals in late lactation i.e. >8 months after calving. Sharma *et al.* (2007) found higher prevalence rate during the late lactation followed by early and mid stage of lactation. Higher prevalence of SCM in early stage of lactation can be correlated with stress of transition period and high level of milk production while late lactation period is more vulnerable to infections. Out of 31 cases of SCM (Table 3), maximum number of animals were found positive with one quarter milk sample (48.39%) followed by two quarters (19.35%) and equally positive with three and four quarters (16.13% each). Other workers have also reported maximum involvement of single quarter (Sharma *et al.*, 2007) in SCM. Similar to cow, prevalence was also found more in left quarters (54.84%) than right (45.16%) and in hind quarters (51.61%) than fore quarters (48.39%). Similar finding was also reported by Sharma *et al.* (2007). The higher prevalence of SCM in hind quarters might be due to higher chances of contamination of hind quarters with faeces, urine and uterine discharges.

CONCLUSION

The result of the present study indicated a fair prevalence of SCM in dairy cows and buffaloes of the Mahendergarh and Rewari districts of south Haryana. Based on the findings, it can be concluded that the prevalence of SCM is higher in cows as compared to buffaloes. In both the species, maximum number of positive cases found in the animals of 6-8 years of age, 1st to 3rd lactation and during first two months of calving with more involvement of left and hind quarters.

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