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Prevalence of Severity of Mastitis in Buffaloes in District Faisalabad (Pakistan)

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ABSTRACT

This study was conducted to determine the quarter-wise and animal-wise prevalence of sub-clinical mastitis in dairy buffaloes in and around Faisalabad. For this purpose, 400 quarter samples from 100 healthy dairy buffaloes were collected randomly from different areas of Faisalabad. Milk samples were analyzed by Surf Field Mastitis Test (SFMT) for the presence of sub-clinical mastitis. Animal-wise prevalence was found 51%, while overall quarter-wise prevalence was 37.75% quarters. Among mastitic quarters maximum prevalence was found in Right Rear (30.45%) followed by left front, right front and left rear with values of 24.50, 23.84 and 21.19%, respectively.

Key Words: Sub-clinical mastitis; Buffaloes; Surf field mastitis test; Prevalence

INTRODUCTION

Mastitis is a serious disease in dairy animals causing great economic losses due to reduction in milk yield as well as lowering its nutritive value. Generally mastitis occurs in two forms i.e., clinical or overt and sub-clinical or hidden (Radostitis *et al.*, 2000). Sub-clinical mastitis is 15 - 40 times more prevalent than clinical mastitis and causes high economic losses in most dairy herds (Schultz *et al*., 1978). In addition to causing colossal economic losses to farmers, the disease is important from consumers and processors' point of view. The milk from the affected animals may harbour the organisms potentially pathogenic for humans (Barbano, 1989). Mastitis affects the milk quality in terms of decrease in protein, fat, milk, sugar (lactose) contents and increase in somatic cell count. The processing of such milk results in substandard and sub-optimal output of finished fermented products like yogurt, cheese etc. The shelf life of processed milk is also reduced (Urech *et al.*, 1999). In United States, sub-clinical mastitis is responsible for 60-70% of total economic losses associated with all mastitic infections (Merill & Galton, 1989). These losses may even be higher in Pakistan, because mastitis prevention practices like teat dipping and dry period antibiotic therapy are not in vogue. Since there is no gross swelling of quarters or abnormality of milk, sub-clinical mastitis is recognized by laboratory examination or by animal side tests. The common farmers are not so much familiar with these techniques. So the present study was conducted to determine the quarter-wise and animal-wise prevalence of sub-clinical mastitis in buffaloes in Faisalabad district of Punjab, Pakistan, using an easy animal side test viz., Surf Field Mastitis Test (SFMT).

MATERIALS AND METHODS

Milk samples form apparently mastitis free 400 quarters of 100 lactating animals belonging to different areas (rural, urban & peri-urban) of district Faisalabad were collected. The samples were subjected to SFMT. The principle of the test is that when detergent is added into milk sample, it causes rupture of somatic cell and release DNA and other cell contents. DNA is acid in nature, while detergent contains alkyl-aryl-sulfonate, which is basic in nature. DNA and detergents unite to form a gel, consistency of gel depends upon the number of somatic cells. More cells more thick gel and *vice versa*. For this purpose, three percent surf solution (pH = 10.3) was prepared by adding three grams of commonly used detergent powder [Surf Excell, Lever Brothers (Pvt) Ltd. Pakistan] in 100 mL of water. Quarter milk samples and surf solution were then mixed in equal quantities in petri-dishes separately for each quarter. The change in consistency of milk indicated mastitis, while no change in consistency of milk indicated healthy samples. The mastitis was graded into further four categories based on the severity of disease from lower to higher intensity as, T (±), P1 (+), P2 (+ +) and P3 (+ + +), respectively (Muhammad *et al.*, 1995). The prevalence was calculated as described by Thrusfield (1986) and percent result was calculated.

RESULTS AND DISCUSSION

Animal wise prevalence of sub-clinical mastitis in buffaloes is depicted in Table I. The results showed that out of 100 healthy dairy buffaloes, 51 were found positive with sub-clinical mastitis. Our result is in close agreement of previous study of Anwar and Chaudhary (1983) who reported a prevalence of 47.5% in buffaloes using Strip Cup test, pH test and Whiteside test. Hashmi and Munir (1981) reported prevalence of 44.9% in buffaloes based on cultural examination. Rahman *et al.* (1983) reported on the basis of direct, indirect and cultural examination, a prevalence of 36.8% of sub-clinical mastitis in buffaloes. Said and Abd-el-

Malik (1968) reported a prevalence of 38.07% in buffaloes on the basis of Whiteside test and California Mastitis Test. Fazal-ur-Rehman (1995) in his study observed the animal wise prevalence of sub-clinical mastitis as 30.5% in buffaloes. Dhakal (2006) reported the prevalence of 21.7% sub-clinical mastitis in Murrah buffaloes. Costa *et al.* (2000) reported 18.77% prevalence of sub-clinical mastitis in lactating Murrah buffaloes in the state Sao Paulo. While Bachaya *et al.* (2005a) determined very high prevalence (77.98%) of sub-clinical mastitis in buffaloes based on SFMT in Attock district of Punjab (Pakistan).

Infection rate (No. of quarters affected per animal) of sub-clinically mastitic animals (n = 51) is given in Table II. Out of affected animals, single quarter infection, two quarter infection, three quarter infection and all quarter infection per animal, was 13.72, 25.49, 11.76 and 49.01%, respectively. So four (all) quarter infection is observed in maximum (49.01%) no. of animals, followed by two quarter infection (25.49%) among mastitic animals, it indicates that chances of infection among quarters is high when any single quarter is infected.

Out of 400 quarter samples 37.75% were mastitic, while 62.25% quarters were healthy (Table III). Previous studies conducted by Bachaya *et al.* (2005a) determined the quarter wise prevalence of 58.75% sub-clinical mastitis in buffalo based on SFMT. Fazal-ur-Rehman (1995) reported the quarter wise prevalence of sub-clinical mastitis as 64% in buffaloes. Khan and Muhammad (2005) found 27% of quarters affected with sub-clinical mastitis in buffaloes. Pal *et al.* (1989) determined 23.08% quarter wise prevalence of sub-clinical mastitis on the basis of bacteriological examination. Costa *et al.* (2000) reported 10% prevalence rate of sub-clinical mastitis on quarter basis in Murrah buffaloes in the state Sao Paulo. Rahman *et al.* (1983) reported quarter prevalence of 11.7% in Iraq. Dhakal (2006) found that out of 200 normal buffaloes 9% buffaloes had CMT positive scores, while defining normal SCC in buffaloes.

Out of total 151 (37.75%) quarters percentage of quarters in T, P1, P2 and P3 with respect to severity of mastitis was 20.25, 45.69, 25.16 and 8.61%, respectively (Table IV). Dhakal (2006) subjected 200 quarter milk samples of clinically normal buffalo to CMT and found that quarter milk samples at CMT score T, 1+, 2+ and 3+ were 6, 5, 2.5 and 1.5%, respectively. Bachaya *et al.* (2005b) observed that out of 100 (33.33%) sub-clinically affected quarters in cows, P1 (one positive quarter) and P2 (two positive quarter) with respect to severity based on SFMT score were 70 (23.33%) and 30 (10%), respectively.

The prevalence of mastitis in LF, LR, RF and RR quarters was 24.51, 21.19, 23.84 and 30.46% respectively (Table V), so there was high prevalence of mastitis in RR quarters. Khan and Muhammad (2005) reported high prevalence of mastitis in LR quarters (37%) and values found for LF, RF and RR quarters were 18.5, 14.8 and 29.6%, respectively in buffaloes. Dhakal (2006) reported non-significant ($P > 0.05$) comparison of sub-clinical mastitis in clinically normal quarters of buffaloes and found values of 8, 6, 10 and 8% in LF, LR, RF and RR quarters.

Out of total 37 (24.51%) LF mastitic quarters percentage of quarters in T, P1 and P2 with respect to severity of mastitis was 21.62, 43.24, and 35.13%, respectively (Table VI), while no LF quarter was affected with third degree severity. Out of total 32 (21.19%) LR mastitic percentage of quarters in T, P1, P2 and P3 with

Table I. Animal wise prevalence of mastitis in buffaloes (N = 100)

Mastitic		Healthy	
No.	%	No	%
51	51	49	49

Table II. Type of infection in mastitic animals (N = 51)

Type of infection	Animals Affected	Percent (%)
Single quarter infection	7	13.72
Two quarter infection	13	25.49
Three quarter infection	6	11.76
Four (All) quarter infection	25	49.01
Total	51	100

Table III. Quarterwise prevalence of mastitis in buffaloes (n = 400)

Mastitic		Healthy	
No	%	No	%
151	37.75	249	62.25

Table IV. Prevalence of severity of mastitis in mastitic quarters (n = 151)

Severity of mastitis	Quarters affected	Percent (%)
T	31	20.52
P1	69	45.69
P2	38	25.16
P3	13	8.61
Total	151	100

Table V. Interquarter comparison of prevalence of sub-clinical mastitis

Quarter examined	Mastitic		Healthy	
(n = 400)	No	%	No	%
L F (n=100).	37	24.51	63	25.30
L R (n=100).	32	21.19	68	27.30
R F (n=100).	36	23.84	64	25.70
R R (n=100).	46	30.46	54	21.68
Total (n=400).	151	100	249	100

Table VI. Interquarter comparison of severity of mastitis in mastitic quarters

Quarter	T		P1		P2		P3	
(n = 151)	No	%	No	%	No	%	No	%
LF	8	21.62	16	43.24	13	35.13	0	00.00
LR	5	15.62	17	53.12	7	21.87	3	09.37
RF	6	16.66	21	58.33	7	19.44	2	05.55
RR	12	26.08	15	32.61	11	23.91	8	17.39

respect to severity of mastitis was 15.62, 53.12, 21.87 and 9.37%, respectively. Out of total 36 (23.84%) RF mastitic quarters percentage of quarters in T, P1, P2 and P3 with respect to severity of mastitis was 16.66, 58.33, 19.44 and 5.55%, respectively. Out of total 46 (30.46%) RR mastitic quarters percentage of quarters in T, P1, P2 and P3 with respect to severity of mastitis was 26.08, 32.61, 23.91 and 17.39%, respectively.

There is high prevalence of mastitis in dairy buffaloes in our field conditions, which ultimately reflects the bad quality of milk available to the consumers. This is due to the following reasons. Regular screening tests for sub-clinical mastitis are not practiced in the field by the farmers. As mastitis is managemental problem and mastitis prevention practices like dry cow therapy, pre and post-milking teat dip are not practiced at most of the milking sheds. Most common pathogens of mastitis are contagious, at the time of milking these pathogens are exposed to non-mastitic animals from milkers' hand, because no preference of milking non-mastitic animals first is done. Milking procedure in our conditions is accompanied with unhygienic conditions and the teats are exposed to injury with inverted thumb method of milking. The buffaloes are predilected for water and muddy places and consistently sit in dry and un-hygienic milking places, sheds etc., and there is close contact between healthy and diseased animals in common grazing and wallowing places. As weaning is not practiced so un-weaned calves often cause injury to the udder and create a focus for infection, the calves cause injury, because of biting, pulling and hitting the udder. While open grazing in the field the large, pendulus and hanging udders are often exposed to injury and infection develops.

CONCLUSIONS

Teats should be clean and washed with an effective germicidal chemical to avid the spread of Mastitis. All the quarters of buffalo should be treated at drying off with antibiotics. Proper milking procedure should be practiced. Mastitic animals should be kept and milked separately. After milking the animal should not be allowed to sit immediately, because after milking the teat sphincter remain open for some time and if animal sits at that time there are maximum chances of infection due to contact of teat with un-hygienic places. Regular screening of mastitis should be done. Chronically infected animals, who do not respond to the treatments, should be culled out from the herds.

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