

THE INCIDENCE OF CLINICAL AND SUBCLINICAL MASTITIS
IN DIARY COWS AT THE DRY PERIOD IN BAGHDAD

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SUMMARY

The present study was conducted on one hundred twenty non-lactating cows located in two different regions in Baghdad. The overall incidence of clinical and subclinical mastitis was found to be 10.0% (5.26% on quarter basis) and 30.47% (11.43% on quarter basis) respectively. Bacteriological examination of 401 milk samples revealed that Staphylococcus aureus was the chief etiological agent (36.15%), both in clinical and subclinical mastitis followed by Streptococcus agalactiae (21.69%), Escherichia coli (13.25%), Streptococcus dysgalactiae (9.64%), Streptococcus uberis (6.02%), Corynebacterium pyogenes (6.02%), Klebsiella pneumoniae (2.41%), Staphylococcus epidermidis (2.41%) and Pseudomonas aeruginosa (2.41%). It was noticed that the udder infection was high during the first and last two weeks of the dry period (14.16% and 24.16% respectively).

INTRODUCTION

Mastitis is known to be widely prevalent in all countries of the world. This disease is posing a serious problem to the dairy industry. It is considered to be the most important disease problem encountered by the dairyman at the present time. Mastitis is responsible for causing heavy losses due to the reduced milk production, degrading of milk quality and additional cost in the care and treatment of mastitis animal⁽¹⁾. In addition, the disease renders the animal non productive and of no economical value. Apart from its

economic losses, the disease is also of significance from public health point of view⁽²⁾.

In most countries, surveys of the incidence of mastitis irrespective of cause, show comparable figures of about 40% morbidity amongst dairy cows and a quarter infections rate of about 25%. Experimental infection of quarters during the dry period causes 35% reduction in yield in these quarters during the next lactation. Quarters found to be infected in late lactation had a 48% reduction in yield but if the infection occurred in the dry period, the depression of yield after calving was only 11%⁽³⁾.

Clinical mastitis occurs during lactation in at least 40% of the glands contracting new dry period infection. In addition, about 80% of glands contracting new dry period coliform infection develops acute mastitis within the first six weeks of lactation⁽⁴⁾.

Cows are commonly dried off at the end of a lactation by abrupt cessation of milking or by milking them at gradually increasing intervals⁽⁵⁾. Many new infections occur during this period due to the flare-ups of infections not apparent during lactation or to the fall in bactericidal and bacteriostatic quantities of the milk which are at their lowest ebb during the dry period.

The present study was designated to determine the prevalence of different types of udder infection in two herds in dairy cows at the dry period and to isolate and identify the bacteria associated with this infection.

MATERIALS AND METHODS

Two herds in White Gold village (63 cows) and other in Al-Futhalia village (57 cows) at the dry period near Baghdad were examined clinically for the presence of mastitis. All information concerning breed, age, number and stage of lactation were recorded. Milk samples were

collected aseptically in sterile test tube from each quarter. The samples were transferred immediately to the laboratory. California mastitis test (CMT) was conducted on 25 and 376 milk samples obtained from clinical and subclinical cases of mastitis respectively. A loopful from each sample was inoculated on 5% sheep blood agar and MacConkey agar. Cultures were incubated at 37°C for 48-72 hours. The growth was examined macroscopically and microscopically. The isolates were identified according to their cultural morphological and biochemical characteristics as suggested by Carter⁽⁶⁾.

RESULTS

Milk samples obtained from cases affected with clinical mastitis (25 samples) and that affected with subclinical mastitis (376 samples) gave positive reaction to CMT ranged from (1+) to (4+). The overall incidence of clinical and subclinical mastitis was found to be 10.0% (5.26% on quarter basis) and 30.47% (11.43% on quarter basis) respectively. (Tables 1 and 2).

Bacteriological examination of 401 milk samples revealed that Staphylococcus aureus (36.15%) was the chief etiological agents, both in clinical and subclinical mastitis followed by Streptococcus agalactiae (21.69%), Escherichia coli (13.25%), Streptococcus dysgalactiae (9.64%), Streptococcus uberis (6.02%), Corynebacterium pyogenes (6.02%), Klebsiella pneumoniae (2.41%), Staphylococcus epidermidis (2.41%) and Pseudomonas aeruginosa (2.41%). (Table 3).

The udder infection was high during the first two weeks (14.16%) and the last two weeks (24.16%) of the dry period (Table 4).

DISCUSSION

The incidence of clinical mastitis (10.0%) was considered low in comparison with those reported

Table 1: Incidence of clinical mastitis in dairy cows at the dry period

Herd	No. of cows examined	No. of quarters examined	No. showing		Prevalence rate(%)	
			Clinical Animals	Mastitis Quarters	Animal basis	Quarter basis
White-Gold village	63	250	5	11	7.93	4.4
Al-Futhalia villag	57	228	7	14	12.28	5.70
Total	120	478	12	25	10.00	5.26

Table 2: Incidence of subclinical mastitis in dairy cows at the dry period

Herd	No. of cows examined	No. of quarters examined	No. showing		Prevalence rate	
			subclinical Animals	Mastitis Quarters	Animal basis	Quarter basis
White-Gold village	56	201	15	21	26.78	10.4
Al-Futhalia villag	49	175	17	22	34.69	12.5
Total	105	376	32	43	30.47	11.4

Table 3. Relative frequency of different types of mastitis pathogens in clinical and subclinical infections at the dry period.

Type of infection	No. of quarters examined	No. of quarters found infected	No. of mixed infection	Total isolation	Type of infection detected (number of quarters with percentage)								
					Staph. aureus	Staph. epidermidis	Str.agalactiae	Str. dysgalactiae	Str. uberis	Str. C.pyo- genes	E. coli	Kleb- siella	Pseudo- monas
Clinical	25	23	7	30	10 (33.33)	2 (6.67)	6 (20.0)	2 (6.67)	2 (6.67)	2 (6.67)	4 (13.33)	1 (3.33)	1 (3.33)
Sub- Clinical	376	43	10	53	20 (37.33)	0 (0.0)	12 (22.64)	6 (11.32)	3 (5.66)	3 (5.66)	7 (13.21)	1 (1.89)	1 (1.89)

Table 4: Relative frequency of different types of mastitis pathogens in udder infections at different stages of the non-lactating period.

Non-lactating period (weeks)	Type of infection detected (number with percentage)						Total	
	staphylococci	Str-aga lactatise	Str-dys-galactatise	Other Streptococci	C. Pyogenes	E. Coli		Other gram-negative bacteria
1-2	9 (28.13)	4 (22.22)	1 (12.5)	0 (0.0)	0 (0.0)	2 (18.18)	1 (25.00)	17 (14.16)
2-4	4 (12.5)	2 (11.11)	0 (0.0)	1 (20.00)	0 (0.0)	1 (9.09)	0 (0.0)	8 (6.56)
4-6	3 (9.37)	0 (0.0)	1 (12.5)	1 (20.00)	1 (20.00)	1 (9.09)	0 (0.0)	6 (5.00)
6-8	1 (3.12)	1 (5.56)	1 (12.5)	2 (40.00)	1 (20.00)	0 (0.0)	1 (25.00)	7 (5.83)
8-10	4 (12.5)	5 (27.78)	2 (25.00)	0 (0.0)	2 (40.00)	2 (18.18)	0 (0.0)	13 (10.83)
10-12	11 (34.38)	6 (33.33)	3 (37.5)	1 (20.00)	1 (20.00)	5 (45.46)	2 (50.00)	29 (24.16)

previously (7.8 and 9), but higher than those reported by Eberhart and John⁽¹⁰⁾ and Egan⁽¹¹⁾.

The incidence rate of subclinical udder infections was found to be 30.47% (11.43% on quarter basis). The figure of subclinical mastitis was somewhat lower than those of earlier and recent mastitis surveys undertaken by various workers^(4,7,8 and 9). In these reports, the incidence of subclinical mastitis ranged from 40% to 45%. This high rate of infection in the dry period was the main reason for the high incidence of clinical mastitis during next lactation⁽⁴⁾.

In Iraq, the incidence of clinical mastitis in the early stage of lactating cows, appears to be high (33% on animal basis and 12.64% on quarter basis)⁽¹²⁾. This may be possibly due to the absence of dry cow therapy at the end of lactation and disinfection of teat skin at drying off. The high incidence of new infection during the non lactating period and of clinical mastitis during the early stage of lactation emphasize the importance of the non lactating period in mastitis control.

There are many factors involved in the occurrence of new dry period infection. The lack of flushing of the teat canal that occurs during lactation is absent. The few bacteria that remain in the teat canal at the beginning of the dry period build up to high numbers and are the cause of the most new infection⁽⁴⁾. In addition, the teats are no longer washed prior to milking which results in greater teat contamination especially if dry cow environment is wet and dirty⁽¹⁻⁴⁾.

The bacteriological examination of quarter milk samples revealed that Staphylococci and Streptococci were the major etiological agents, both in clinical and subclinical mastitis in cows (38.55% and 37.35% respectively), followed by E. coli(13.25%). However, the incidence of infections due to other than these organisms was infrequent. These findings were in agreement with those of other workers^(2,5,9,11,12, and 13), who reported that Staphylococci and Streptococci

along with coliform organisms were the common etiological agents.

The rate of infection was high during the first and last two weeks of the dry period. These observations were in agreement with that reported by others^(2, 14, and 15). The higher rate of infection in the early dry period is possibly due to, at this time, bacteria are able to penetrate the streak canal to the test sinus more easily. Carol *et al*⁽¹⁴⁾ noticed that even a very small numbers of bacteria infused through the streak canal into the teat sinus, at the beginning or the middle of the dry period, resulted in new intermammary infections. The increase in the rate of infection at the last two weeks of the dry period was due to the increase in the hydrostatic pressure within the gland sinus results in dilation of the proximal and middle part of the papillary duct, thus shortening the effective length and, therefore, make penetration of the papillary duct easier for organisms on the teat skin.

The present study suggests that dipping teats of lactating cows in a disinfectant solution and injecting antibiotics into mammary glands at dry off is the only proved effective mastitis control.

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حدوث التهاب الضرع السريري وتحت السريري في الإبقار
الحلوب خلال فترة الجفاف في محافظة بغداد

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الخلاصة

لقد اجريت الدراسة الحالية على مئة وعشرين من الإبقار
الحلوبية خلال فترة الجفاف في منطقتين مختلفتين في اطراف
بغداد.

لقد وجد بأن نسبة حدوث التهاب الضرع السريري وتحت
السريري هي ١٠,٠٠% (٥٢,٦% وفقاً لاصابة الشطر) و٣٠,٤٧%
(١١,٤٣% وفقاً لاصابة الشطر) على التوالي.

اتضح من العزل الجرثومي لـ (٤٠١) نموذج حليب بأن
المكورات العنقودية الذهبية (٣٦,١٥%) كانت المسبب الرئيسي
في كلا النوعين من التهاب الضرع السريري وتحت السريري،
تلتها المكورات المسبحية الاكلكشيا (٢١,٦٩%)، الايشيريكيا
القولونية (١٣,٢٥%)، المكورات المسبحية ديزكلشيا (٩,٤٦%)
الوتديات القحبية (٦,٠٢%)، الكلبسيلا نيموني (٢,٤١%)،
المكورات العنقودية البشرية (٢,٤١%) والسيدوموناس
ايروجينوزا (٢,٤١%). كانت نسبة خمج الضرع عالية خلال
الاسبوعين الاوليين (١٤,١٦%) والاسبوعين الاخيرين (٢٤,١٦%) من
فترة جفاف الضرع.