SUBCLINICAL MASTITIS IN FAYOUM GOVERNORATE

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Abstract

Subclinical mastitis is a serious form of mastitis which affects the dairy herds, but without any clinical symptoms on the affected animal which usually appears healthy.

In the present study, California mastitis test (CMT) proved to be an efficient rapid field test for detection of subclinical mastitis. When applied on 720 milk samples collected from 180 dairy cows, 320 (44.4%) were positive (++) to the test.

The bacteriological examination of the 320 quarter milk samples revealed that staphylococci were the most predominant (62.8%), followed by streptococci, members of Gram-negative bacilli, corynebacteria and anthracoides in an incidence of (40.9%), (40.6%), (5.9%) and (1.7%), respectively. However, the season and age of the animals seem to influence the incidence of different secured microorganisms.

The antibiogram of the isolated bacteria revealed that gentamycin followed by chloramphenicol and / or oxytetracycline were the most effective antibiotics.

INTRODUCTION

Healthy mammary glands are essential for the secretion of mikk, that is wholesome to drink and produced in sufficient quantity to be profitable to dairy men. Reduction in milk yield and production of abnormal milk is mostly due to mastitis, resulting in considerable economic losses to diary industry throughout the world.

Since most mastitic cases occur in the subclinical form, the diseased animal continues, for a time, to be a dangerous source of infection.

The present work was conducted to detect cases with subclinical mastitis by rapid field test (CMT), and to enumerate different bacteria associated wih it in bovine udders during the various seasons of the year. Moreover, in vitro antibiotic sensitivity test on the isolated bacteria was performed to ensure rapid and prompt recovery of affected udder.

MATERIALS AND METHODS

A total of 720 quarter milk samples were collected aseptically during the different seasons of the year from 180 cows with apparently normal udders kept at private and governmental dairy farms in Fayoum governorate.

All samples were subjected to CMT according to Schalm et al. (1971), and samples giving (++) and over were considered positive and were bacteriologically examined. The isolated organisms were identified according to Krieg and Holt (1984) and Sneath *et al.* (1986).

In vitro, antibiotic sensitivity test of the isolated bacteria was carried out according to Cruickshank et al. (1975) .

RESULTS

California mastitis test on 720 milk samples revealed that, 320 (44.4 %) were positive (++ or more) and were considered as subclinical mastitic cases (Table 1).

Table 1. Incidence of subclinical mastitis.

Total No.	Total No. of	App	arently healthy	quarter sam	ples
of examined	examined quarter	Positiv	re cases	Negative	cases
animals	milk samples ^{MO}	No C	9T1%	No	%
of mike that	for the secretion	320	prod icted in a constant	100 o	55.6

The percentage is correlated to the total number of quarter milk samples 720

Culture examination revealed bacterial growth in the 320 quarter samples in an incidence of (100.0%) represented by (Staphylococcus spp., Streptococcus spp., Gram-negative bacilli, Corynebacteria and Anthracoides) (Table 2), in the following incidence: (57.5%) Staph. aureus, (5.3%) Staph. epidermidis, (18.4%) Str. uberis; (15.9%), Str. agalactiae, (4.4%), Str. dysgalactiae, (2.2%), Str. faecalis, (5.9%) C.pyogenes, (1.7%), anthraciodes, (27.5%), E.coli, (7.2%), Ps. Aureuginosa, (3.4%), P. vulgaris and (2.5%) K. peneumoniae (Table 2).

Table 2. Bacterial isolates from subclinical mastitic milk samples .

Organisms	No. of Isolat	5 (26,32%) es	Incidence %
(Gram positive cocci)	2 (40.0%)	1 (20.296)	Anthrocoides
1- Staphylococcus spp. S	45 (102) 496) 20 ((3(14,7796)	62.8
* Staph. aureus	4 (481,19%)	8 (34,78%)	57.5 อกกฎษายธ. เล
* Staph. epidermidis	7 (4716496)		5.3 straight .9
2- Streptococcus spp.	131	(0000,01)0	40.9
* Str. uberis		154 (31.69%)	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
* Str.agalactiae	51		15.9
* Str. daysgalactiae	14.4	t hatelettes at	4.4 arl 1
* Str. faecalis •	7	u uztarzeni, zi	2.2
The same of the sa	HCAL MASTILIS TOGELI		I ne tilgnest intic
			5.9 at to notiste
* C.pyogenes	d. Meanwhile, the	lactation perior	int 5.9
4- Anthracoides	ctation period (Tabl	o in the first la	0.99 %) was obtaine
5- (Gram negative bacilli)	130		40.6
* E.coli	etra 88	enical and oxyt	27.5
* P.vulgaris	11		3.4
* K.pneumoniae	8		2.5
* Ps. aureuginoea	MO235UC	- Christian	7.2

^{*} The percentage is correlated to the stal number of examined samples.

The isolation rate was highest during summer months "157 (32.30%)", followed by spring "154 (31.69%)", winter " 105 (21.60%)" and autumn "70 (14.40%). Moreover, *Staph. aureus* was the most frequently recovered from the subclinical milk samples during different seasons followed by *E.coli, Str. agalactiae* and *Ps. aureginosa* (Table 3).

Table 3. Number and incidence of isolated micro-organisms from subclinical mastitic milk samples during the differnt seasons of the year.

Isolated micro - organisms	Spring	Summer	Autumn	Winter	Total
Staph aureus	59 (32.06%)	56 (30.35%)	23 (12.5%)	46 (25.0%)	184 (37.86%)
Staph epidermidis	5 (29.41%)	6 (35.29%)	6 (35.29%)	franchise is	17 (3.50%)
Str. agalactiae	17 (33.33%)	17 (33.33%)	9 (17.64%)	8 (12.86%)	51 (10.49%)
Str dysgalactiae	7 (50.0%)	7 (50.0%)			14 (2.88%)
Str. uberis	30 (50.89%)	subclinical mar	mon resisted	29 (49.15%)	59 (12.14%)
Str. fecalis	3 (42.86 %)	4 (57.14%)			7 (1.44%)
C. pyogenes	5 (26.32%)	9 (47.37%)	5 (26.32%)	Recollines.	19 (3.91%)
Anthracoides	1 (20.2%)	2 (40.0%)	(inc	-1 (20.0%)	5 (1.03%)
E. coli	13 (14.77%)	45 (51.14%)	20 (22.72%)	10 (11.36%)	88 (18.11%)
Ps. aureginosa	8 (34.78%)	4 (17.39%)	5 (21.74%)	6 (26.09%)	23 (4.73%)
P. vulgaris		7 (63.64%)		4 (36.36%)	11 (2.26%)
K. pneumoniae	6 (75.00%)		2 (25.00%)		8 (1.65%)
Total 4	154 (31.69%)	157 (32.30%)	70 (14.40%)	105 (21.60%)	488

^{*} The percentage is correlated to the total number of the isolates .

The highest incidence of subclinical mastitis together with the highest rate of isolation of bacteria, 229 (47.2%) out of 486 were met with in the milk samples of cows during the 3rd lactation period. Meanwhile, the lowest recovery rate 102 (20.99 %) was obtained in the first lactation period (Table 4).

The antibiogram of the isolated bacteria was shown in Table 5,where gentamycin, chloramphenicol and oxytetracycline were the most effective .

DISCUSSION

To date, mastitis constitutes a great economic loss to milking herd. Its serious effects are derived from the subclinical form, which is devoid of obvious symptoms and secretes apparently normal contaminated milk for a long time, during which infection can spread in the herd.

In Table 1, it is interesting to note that out of 720 quarter milk samples collected from 180 cows, 320 milk samples showed positive CMT (++ or more) in an

Table 4. Relationship between the age of the apparently normal animals and the isolted micro-organisms from their milk samples .

organisms Total Tist lactation period 2 nd lactation period 3 rd lactation period Staph. aureus 184 32 (17.39%) 62 (33.69%) 90 (48.91%) Staph. epidermidis 17 3 (17.65%) 5 (29.41%) 9 (52.94%) Str. uberis 59 12 (20.34%) 14 (24.45%) 29 (49.16%) Str. agalactiae 51 10 19.61%) 14 (24.45%) 27 (52.94%) Str. dysgalactiae 14 3 (21.43%) 5 (35.71%) 6 (42.86%) Str. dysgalactiae 14 3 (21.43%) 2 (28.57%) 3 (42.86%) C. pyogenes 19 6 (31.58%) 6 (31.58%) 3 (42.86%) Anthracoides 5 2 (20.00%) 2 (40.00%) 7 (30.43%) Ps. aureginosa 23 7 (30.43%) 3 (37.50%) 7 (30.43%) Ps. vulgaris 11 3 (27.27%) 3 (37.50%) 3 (37.50%) Total 486 32 (17.39%) 155 (31.92%) 229 (47.12%)		Isolated micro -			Ϋ́	Age of cows with a pparently healthy udders	a ppar	ently	healt	hy udders					
Staph. aureus 184 32 (17,39%) 62 (33.69%) 90 (48,91%) Staph. epidermidis 17 3 (17,65%) 5 (29.41%) 9 (52.94%) Str. uberis 59 12 (20.34%) 18 (30.51%) 29 (49.16%) Str. agalactiae 51 10 19,61%) 14 (24.45%) 27 (52.94%) Str. dysgalactiae 14 3 (21.43%) 5 (35.71%) 6 (42.86%) Str. feacalis 7 2 (28.57%) 2 (28.57%) 3 (42.86%) C. pyogenes 19 6 (31.58%) 8 (31.58%) 8 (42.86%) Anthracoides 5 2 (20.00%) 2 (40.00%) 7 (36.43%) Ps. aureginosa 23 7 (30.43%) 7 (30.43%) Ps. vulgaris 11 3 (27.27%) 3 (37.50%) 3 (37.50%) R. pneumoniae 8 2 (25.00%) 3 (37.50%) 3 (37.50%)		organisms	Total	1st lactation perior		2 nd lactation p	eriod		m	d lactation per	poi				-
Straph. epidermidis 17 3 (17.65%) 5 (29.41%) 9 (52.94%) Str. uberis 59 12 (20.34%) 18 (30.51%) 29 (49.16%) Str. agalactiae 51 10 19.61%) 14 (24.45%) 27 (52.94%) Str. descalis 7 2 (28.57%) 2 (28.57%) 6 (42.86%) Str. feacalis 7 2 (28.57%) 2 (28.57%) 3 (42.86%) C. pyogenes 19 6 (31.58%) 6 (31.58%) 3 (42.86%) Anthracoides 5 2 (20.00%) 2 (40.00%) 2 (47.73%) Anthracoides 5 2 (22.73%) 2 (6 (29.45%) 42 (47.73%) Ps. aureginosa 23 7 (30.43%) 7 (30.43%) 7 (30.43%) Ps. vulgaris 11 3 (27.27%) 3 (37.50%) 3 (37.50%) Total 486 32 (17.39%) 155 (31.92%) 229 (47.12%)	10 :	Staph. aureus	184	32 (17.39%)	-	62 (33.69%)		6	12	90 (48.91%)	1	, in	0,6	E.	
Str. uberis 59 12 (20.34%) 18 (30.51%) 29 (49.16%) Str. agalactiae 51 10 19.61%) 14 (24.45%) 27 (52.94%) Str. descalis 7 2 (28.57%) 5 (35.71%) 6 (42.86%) 7 Str. feacalis 7 2 (28.57%) 2 (28.57%) 3 (42.86%) 7 C pyogenes 19 6 (31.58%) 6 (31.58%) 8 2 (20.00%) 2 (40.00%) 2 (36.84%) 8 8 Anthracoides 5 2 (20.00%) 2 (40.00%) 2 (40.00%) 42 (47.73%) 8 E. coli 88 20 (22.73%) 9 (39.13%) 7 (30.43%) 9 (39.13%) P. vulgaris 11 3 (27.27%) 3 (27.27%) 3 (37.50%) 8 Total 486 32 (17.39%) 155 (31.92%) 229 (47.12%)		Staph. epidermidis	17	3 (17.65%)		5 (29.41%)				9 (52.94%)	1	0	1 1 2	. 0	-
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Str. dysgalactiae 14 3 (21.43%) 5 (35.71%) 6 (42.86%) 9 Str. feacalis 7 2 (28.57%) 2 (28.57%) 3 (42.86%) 9 C. pyogenes 19 6 (31.58%) 6 (31.58%) 9 7 (36.84%) 9 Anthracoides 5 2 (20.00%) 2 (40.00%) 9 1 (20.00%) 9 E. coli 88 20 (22.73%) 26 (29.45%) 7 (30.43%) 9 (39.13%) 7 (30.43%) Ps. aureginosa 23 7 (30.43%) 3 (27.27%) 5 (45.45%) R. pneumoniae 8 2 (25.00%) 3 (37.50%) 3 (37.50%) Total 486 32 (17.39%) 155 (31.92%) 229 (47.12%)		Str. agalactiae	51	10 19.61%)		14 (24.45%)	13			27 (52.94%)	10.5		23		0)
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E. coli 88 20 (22.73%) 26 (29.45%) 42 (47.73%) 83 28 Ps. aureginosa 23 7 (30.43%) 7 (30	55	Anthracoides	2 2	2 (20.00%)	in P	2 (40.00%)	63	10	8.01	1 (20.00%)	5.3	M	2.01	16	-
Ps. aureginosa 23 7 (30.43%) 9 (39.13%) 7 (30.43%) P. vulgaris 11 3 (27.27%) 3 (27.27%) 5 (45.45%) K. pneumoniae 8 2 (25.00%) 3 (37.50%) 3 (37.50%) Total 486 32 (17.39%) 155 (31.92%) 229 (47.12%)	120	E. coli	88	20 (22.73%)	183	26 (29.45%)	0.0E	un -	8.07	42 (47.73%)	9.52	33	8.2	0.0	-
P. vulgaris 11 3 (27.27%) 3 (27.27%) K. pneumoniae 8 2 (25.00%) 3 (37.50%) Total 486 32 (17.39%) 155 (31.92%)		Ps. aureginosa	23	7 (30.43%)		9 (39.13%)		No		7 (30.43%)		Mo	36		-
K. pneumoniae 8 2 (25,00%) 3 (37,50%) Total 486 32 (17,39%) 155 (31.92%)		P. vulgaris	17.00	3 (27.27%)		3 (27.27%)		060		5 (45.45%)			(6	3	
Total 486 32 (17.39%) 155 (31.92%)		K. pneumoniae	80	2 (25.00%)		3 (37.50%)		Vaca.		3 (37.50%)					
	*	Total	486	32 (17.39%)		155 (31.92%	_			229 (47.12%)					

* The : entage is correlated to the total number of isolates.

Table 5. In - vitro antibiogram of isolated bacteria from milk of subclinical mastitic cows.

Antimicrobial	S	Staphylococcus spp.	ococ	ds sh	á		Str	Streptococcus spp.	sccus	sbb.		110	9	Gram-Nagative enteric	agati	ve en	teric		1	C)	Pyog	C. Pyogenes.		
Agents	ľ				1	4	N. N.		(131)		1	5		f	baci	bacilli. (107)	2	the contract of	7		(19			1
	×[-[S	1	~		-		S		~		-		S		œ		-		S	-
PS SURGO	N _O	ጽ	No	8	No	%	No	8	8 N	8	8 N	8	2	*	ò	8	S _O	8	S	*	8	8	^o N	*
Ampcillin	131	131 65.2	9	3.0	64	31.8	62	60.3	11	8.4	41	31.3	32	30.0	12	10.8	63	59.2	10	52.6	31	5.8	9	31.6
Choramphenicol	25	3.5	4	5.0	190	190 94.5	2	1.5	4	3.1	125	95.4	6	8.5	12	10.8	89	80.8	100	5.3	2	10.5	16	84.2
Erythromycin	20	2.0	34	16.9	147 73.1	1	89	51.9	4	3.1	59	45.0	54	50.8	59	28.9	24	22.3	200	36.8	2	26.3	7	36.8
Gentamycin	<u>G</u> .	0.0		0.0	201	100.0	12	0.0	က	2.3	128	7.76	m	3.1	80	7.7	96	89.7	(%)	0.0	-	5.3	18	84.3
Neomycin	22	22 10.9	6	4.5	170	170 84.6	64	48.9	21	16.0		46 35.1	28	54.6	19	17.7	30	27.7		68.4	4	21.1	2	10.5
Oxytetracyclin	17	17 8.5	37	37 18.4 147 73.1	147	73.1	14 10.7		=	8.4	106	106 80.9	56	23.9	25	23.4	26	52.3	2	10.5	4	21.1	13	68.4
Penicillin G	151	151 75.1	7	3.5	43	21.4	99	50.4	19	14.5	46	35.1	94	94 87.7	~	6.9	9	5.4	9	31.6	ю	15.8	10	52.6
Streptomycin	89	89 44.3	19	9.5	93	46.3	54	41.2	36	27.5	4	41 31.3	32	30.0	19	17.71	56	52.3	œ	42.1	80	42.1	m	15.8
Sulphamethoxazole/ Trimethorprim	2115	0.0	1	0.0	201	100.0	93	71.0	16	12.2	22	12.2 22 16.8	54	50.8	20	20 18.5	833	30.8	13	68.4	m	15.8	m	15.8
S.Caux	em			Į.	27	35	700	SGLKO		-	4	381	on the	00176		00	8	0.18	90	501				-

. R = Resistant

S = Susceptible

l = Intermediate

incidence of (44.4%), and this result nearly coincides with the results obtained by Fustes *et al.* (1985) and Lau et al. (1986).

On the other hand, bacteria were isolated from 320 (100.0 %) samples, and similar results were obtained by Misra et al. (1973), Maihotra et al. (1976), Verma et al. (1978), Rao et al. (1981), Anderson et al. (1982) and Kalorey et al. (1983).

Of different isolated bacteria, *Staphylococcus* spp. was the most prevalent with an incidence of (62.8%), followed by *Streptococcus* spp., members of Gram-negative bacilli, *Corynebacterium* spp. and *anthracoides* with an incidence of (40.9%), (40.6%), (5.9) and (1.7%), respectively (Table 2). The aforementioned data are similar to those reported previously by Kalorey *et al.* (1983), Misra *et al.* (1973), Abd-El-Karim and El-Ashmawy (1979) and Abd-El-All (1989).

The effect of the season of the year was distinctly clear on both the incidence of subclinical masttis and the recovery of mastitic pathogens. Table 3 shows that, the highest incidence was during summer (32.30 %), followed by spring (31.69%), winter (21.60 %) and autumn (14.40 %) which are in agreement with Abd-El-All (1989). However, the effect of age on the increased incidence of subclinical mastitis may be attributed to the prolonged exposure of older cows to infection, as well as the lowering of the resistance with advancing age.

Finally, the in vitro antibiogram of bacteria revealed that, gentamycin followed by chloramphenicol and/or oxytetracycline were the most effective, and could be used with confidence in treatment of subclinical mastitis.

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يعتبر النهاب الضيرع تمت الأكلينيكي واعدا من أغطر أنواع التهابات النسرع التي تلاث غر القطعان الملاية بدون أية أغراض إكلينيكية على الميوان الذي يخاور عادة بشكل مسي سليم

شمار هذا اليمث المشاو كاليقورنيا للتشطيص الصريح الاحتمال وجود التباب النبر و نتبد الإكليسكان، وقد النبرت النتائج ان ٢٢٠ مينة لين منصبة (3.33 \) كانت إيجابية للاختبار (++) - ل المداد ، ٢٧ مينة المستحدة من ١٨٠ مترة علوب.

و لقد توضيس ۲۰ مينة اين ڪتريولوهيا ، **ورهد آن اليکررپ المنقربي ه**ر اتساند جنسه) ۲۰ ۲۲ ع رياييه المکروب السيسمي وائيگرويات ا**لجرام والکريشي پاکشر**يا والانشواکو، در بنسينه) ۲- ۲۰ تن ۱۲ تا ۲۰ تن (۲- ۲۰ تن) ن (۲- ۲۰ تا علي الفرائي

واقد وجد أن الرسم وكذلك عمر المدوان لهما تأثير على مختلف للدكروبات للعزولة من عدم العالات ناما لجريت اختيارات مسامية للبكتريا المعزولة من العينات للمعابا بالنهاب الدرج مت الاكلينيكي وكان المساميسين ريليه الكلوراسقينيكول و الاوكس تشراسيكان هي الاكثر فاعليا بمنفة عاما

التهاب الضرع تحت الاكلينيكي في محافظة الفيوم

Leaand Febiger, Philadelphia, U.S.A.

13. Sneath, 9 أغاني محمد رفيق كامل ١ ، مجمد محمد بسيوني ٢٠٥٩ × Manual Ul Systematic Section 1975 مراس معرد الله فرج ١ ، أحمد فريد ٢ ، أحمد فريد ٢ ، أحمد فريد ٢ ...

14.Verma, T.N. L.N. Mandal and B.K. Sinhn. 1978. Studies on subclinical mastrus

with special reference to bacterial correlation and its public health

ا معهد بحوث التناسليات ومراكز البحوث الزراعية و الجيزة - مصراً. 30 Abst. 10

ك كلية الطب البيطري - جامعة القاهرة - الجيزة .

يعتبر التهاب الضرع تحت الاكلينيكي واحدا من أخطر أنواع التهابات الضرع التي تؤثر في القطعان الحلابة بدون أية أغراض إكلينيكية على الحيوان الذي يظهر عادة بشكل صحى سليم.

شمل هذا البحث اختبار كاليغورنيا للتشخيص السريع لاحتمال وجود التهاب الضرع تحتم الإكلينيكي، وقد أظهرت النتائج ان ٣٢٠ عينة لبن بنسبة (٤٤،٤٤٪) كانت إيجابية للاختبار (++) مِن إجمالي ٧٠٠ عينة لبن جمعت من ٨٠٠ بقرة حلوب.

ولقد تم فحص 77 عينة لبن بكتريولوچيا ، ووجد أن الميكروب العنقودي هو السائد بنسبة) 77. ويليه الميكروب السبحى والميكروبات الجرام والكرينى باكتريا والانتراكويدز بنسبة) 77. ويليه الميكروب السبحى الميكروبات الجرام والكرينى باكتريا والانتراكويدز بنسبة) 77. ويليه الميكروبات الميكروبا

ولقد وجد أن الموسم وكذلك عمر الحيوان لهما تأثير على مختلف الميكروبات المعزولة من هذه الحالات ،كما أجريت أختبارات حساسية للبكتريا المعزولة من العينات المصابة بالتهاب الضرع تحت الإكلينيكي وكان البنتاميسين ويليه الكلورامفينيكول و الأوكسى تتراسيكلين هي الاكثر فاعلية بصفة عامة.