قسم طب الحيوان

كلية الطب البيطري ـ جامعة الاسكندرية

رئيس القسم : أ.٠د/ متولي الشناوي

بعض الدراسات على التهاب الضرع الخفي في الأبقار

عبدالكريم عبدالتواب

استخدم اختبار شامل واختبار فريزو لاكتشاف مرض الضرع الخفي في ١١٢ بقـــرة فريزيان وقد أثبتت النتائج أن درجة الاعتماد على اختبار شامل في تشخيص هذا المرض أعلى من اختبار فريزو .

أما بالنسبة للميكروبات التي تم عزلها وهي الميكروب السبحي اجالاكتيــــــا وديجالاكتيا والميكروب العنقودي الذهبي والشيرشيات القولونية وقد كانت درجـــــة حساسيتها معمليا للمضادات الحيوية هي جنتاماسين نيوماسين وبنسلين كاناماســـــين واسترتبوماسين على التوالي والاختلافات في تأثير المضادات الحيوية على الحيوان نفسه وداخل المعمل قد تم أخذها في الاعتبار وقد نوقشت هذه النتائج .

Dept. of Vet. Med.,
Faculty of Vet. Med., Alex. University,
Head of Dept. Prof. Dr. M.M. El-Shinnwy.

SOME STUDIES ON SUBCLINICAL MASTITIS
IN DAIRY CATTLE
(With 4 Tables)

By
A.A. MAHMOUD
(Received at 1/11/1987)

SUMMARY

Schalm and Freiso tests were used as a routine tests for the detection of subclinical mastitis amongst dairy herd of 112 Friesian cows. was found that the reliability of Schalm test (96.3%) was superior than Frieso test (89.5%).

The isolated micro-organisms (Strept. agalactiae, Strept dysagelactiae, Staph. aureus and E. coli) were sensitive to the following antibiotics in descending order: Gentamycin, Neomycin, penicillin, Kanamycin, and Streptomycin. Variation in the vitro and in vivo action of antibiotics was enocumtered, and the results are discussed.

INTRODUCTION

Subclinical mastitis act as an obscure infection hence it is necessary to detect the disease as ealry as possible because of its public health and economic importance (ANDBERG and WEIRETHER, 1944 and MUNRO, et al. 1984).

the development of body-cell screening field tests, help in the quick detection of pathological changes associated with inflammation in the quarter ·from which tested milk was drawn and thus the adequate method needed to cope with periodic whole sale herd testing was introduced. Application of these tests offers a potent tool to aid in selection of cows for either production or therapy (KHALIL, et al. 1972).

The indiscriminate use of antibiotics in the treatment of mastitis as well as in other bacterial diseases may cause the development of strains that are resistant to one or more of these antibiotic. For this reason, it is advisable to carry out the in vitro sensitivity test before clinical application scince it would be of value in choosing the suitable antibiotic (FARRAG and OOF, 1967). On the other hand when interpreting antibiotic sensitivity results, one should remain aware that sensitivity in the laboratory does not always indicate the relative effectiveness of drug when infused into an infected quarter, (PHILPOT, 1969), scince this relationship is depending on many factors that take place inside the mammary gland such as pH, tissue protein binding, and milk components as calcium (DAVIDSON, 1980).

Therefore the aim of this work is to evaluate the efficiency of Schalm and Frieso tests in detection of subclinical mastitis as well as to try the treatment after application of sensitivity test.

A.A. MAHMOUD

MATERIAL and METHODS

Samples:

Milk samples were collected from 112 of apparenty normal quarters milking friesian cows belonging to Raas-El-Soda dairy farm of the Ministry of Defense at Alexandria.

Chemical tests:

Ohemical testing of apparently normal quarter milk samples by Schalm test (SCHALM, et al. 1971) and Frieso test (according to instructure of the manifacture supplied by wellcome).

Bacteriological examination: Each milk sample was collected aseptically in sterile screw capped bottle nad incubated at 37°C for 12hr, then centrifuged for 5 minutes at 1500 RPM. Loopfulls of the sediment were streaked on blood agar. MacConkey's agar media and Edwards medium and incubated at 37°C for 24hrs - 5 days. Pure colonies were identified according to CRUICKSHANK, et al. (1975).

Sensitivity test:

Sensitivities of the isolated mastitis pathegens were tested against five antibiotics: penicillin (10 u.), Streptomycin (10 Ug), kanamaycin (30 Ug) Neomycin (30 Ug) and Gentamycin (10 Ug).

Treatment:

were applied according to the results of the in vitro sensitivity tests. 89 cows. received Gentamycin 80mg dissolved in 10 ml. normal saline solution and infused intramammary twice daily for 5 days. Also 6 animals received Neomycin 500 mg. quarter dissolved in 10 ml. saline and in fused intrammary for 3 days.

Success of treatment was depending on the negative results of milk culture 14 days treatment.

RESULTS

The reliability of the Schalm and Frieso tests and the .percentage agreement of its results as compared the the bacteriological findings are recorded in table (1 & 2).

The sensitivityof isolated micro-organisms to certain antibiotic is recorded in table (3).

The results of relationship between the vitro and the in vivo sensitivity test are recorded in tables (3 & 4).

DISCUSSION

Mastitis is considered the main problem to our dairy industry, causing heavy losses every year. Through, in a magority of cases, the etiology of mastitis is common to staphylococcal and strepto-coccal organisms. which are ammenable to treatment with penicillin and streptomycin, it emeregs out as a problem because it is diagnosed very late, with further complications and induration of udder tissues resulting in the complete loss of udder. The only solution to prevent this loss is to detect the disease at an early stage and to treat with proper remedies (DEORE and KHANDE, 1972).

SUBCLINICAL MASTITIS

These results were agreement with CHAKRABORTY and HAZARIKA (1977), RINDSING, et al. (1979) and EGAN (1982), all of them approved that the agreement between positive schalm test and bacteriological isolation is high.

On contrary, such findings were disagreement with that obtained by FRUGANT and VALENTE (1980) and NARENDRA, et al. (1982), they consider schalm test with limited value for combating subclinical mastitis and the agreement between the test and bacteriological isolateion was low.

The results of two tests obtained in our study means that, there is no one test could be depond completely upon as some cases escapes from being detected by any test. For this reason, we must seek for another more reliable field test or retesting all the animals periodically at one month intervals.

The results of sensitivity tests of the organisms isolated to antibiotics showed that, the most effective antibiotic was Gentamycin. It was effective on (69.4%), then Neomycin (62.7%), penicillin (53.7%), kanamycin (40.3%) and streptomycin (31.3%). The superior effect of Gentarnycin than other antibiotics might be due to the fact that Gentamycin seldom used as a treatment for mastitis in contrast to other antibiotics which most frequently used and may lead to the development of resistant strain.

The results of tables (3 & 4) showed indefinite relationship between in vitro and in vivo sensitivities, which was demanding the awareness of PHILPOT (1969), as this relationship was deponding on many factors (DAVIDSON, 1980).

It is concluded that the in vitro sensitivities may be expensive, beside being inconvenient to culture all quarters but it would be more effective if conducted on several representative isolates each time a herd is cultured for the selection of antibiotic of low probability of resistance to the suspected pathogenic organism that cause subclinical mastitis.

REFERENCES

Andberg, W.G. and Weirether, F.J. (1944): The incidence of bovine mastitis in Minnessota, Cornell Vet., 34, 289.

Chakraborty, A.K. and Hazarika, R. (1977): Evaluation of indirect tests for bovine mastitis. Pakistan Veterinary Journal 6 (5), 161-166.

Cruickshank, R.; Duguid, J.P.; Marmion, B.P. and Swain, R.H.A. (1975): Med. Microbiology, the practice of medical microbiology, Vol. 12th Ed., Churchill livingstone, Edinburgh, London and New York (1975).

Davidson, J.N. (1980): Antibiotic resistance patterns of bovine mastitis pathogens. Proc. NMC 19th Anm. Mtg. pp. 181-185.

Deore, P.A. and Khande, S.A. (1972): Efficacy of Mastaid solution (G lax0) for detection of subclinical mastitis in dairy animals. The Indian Vet. J. 761-764.

Egan, J. (1982): A study of quarter milk samples from lactating cows in Dublin area using the California mastitis tests. Irish Vet. J. 36, 11-12.

Farrag, H. and Oof, F. (1967): Sensitivity of organisms isolated from cases of bovine and goat mastitis to various antibiotics. Indian Vet. J. 1, 44, 640.

Fruganti, G. and Valente, C. (1980): Diagnosis of subclinical mastitis. Clinica Vet. 103 (8), 499-507.

Khalil, A.D.; Barakat, A.A.; Sayour, E.M.; Samira, M.; E. Gibaly and Ismail, Y.S. (1972): Studies on bovine mastits. Proc. 10th Arab Vet. Cong.

Munro, G.L.; Grieve, P.A. and Kitchen, B.J. (1984): Effects of mastitis on milk yield Australian Journal of dairy Technology. 38, 1, 1-16.

Narendra Singh; Sharma, V.K.; Rajani, H.B. and Sinha, Y.R. (1982): Incidence, economy and test efficiency of subchinical mastitis in dairy animals. Indian Vet. J. 59, (9), 643-696.

Philpot, W.N. (1969): Role of therapy in Mastitis control. J. Dairy Sci. Vol. 52, pp. 708-713.

Rindsing, R.B.; Rode Wald, R.G.; Smith, A.R.; Thomsen, N.K. and Spahr, S.L. (1979): Mastitis history, California mastitis test, and somatic cell counts for identifying cows for treatment in a selective dry cow therapy program. J. of Dairy Science 62, (8), 1335-1339.

Schalm, O.W.; Carroll, E.J. and Jain, N.C. (1971): Bovine mastitis. Lea and Febifer, Philadelphia.

Table (1)
Reliability of schalm test as compared to bacteriological results

Scores	No. of samples	Bacteriological +ve	results -ve	Agreement %
-	278	2	276	99.3
+	62	48	14	79.7
++	54	54	-	100
+++	33	33	-	100
Total	427	137	-	

Reliability (96.3%).

Table (2)
Reliability of Frieso test as compared to bacteriological results

Scores	No. of samples	Bacteriological +v	results -ve	Agreement %
-	283	19	264	93.3
+	43	20	23	46.5
++	38	36	2	94.7
+++	63	62	1	98.4
Total	427	137		

Reliability (89.5%).

- negative + weak positive.

++ moderate positive.   +++ strong positive/

Reliability % = $\dfrac{\text{No. of true positive samples + No. of true negative samples}}{\text{total No. of samples}} \times 100\%$

SUBCLINICAL MASTITIS

Table (3)

The sensitivity of isolated Microorganisms to certain antibiotic

Antibiotic	Strept. agalactiae (70)				Strept. dysgalactiae (14)				Staph. aureus (40)				E.coli (10)				Total No. of pathogen sensitive to antibiotic	%
	-	+	++	+++	-	+	++	+++	-	+	++	+++	-	+	++	+++		
Penicillin (10 u)		20	17	33	11	3	-	-	15	3	13	9	10	-	-	-	72	53.7
Streptomycin (10 ug)		58	5	7	8	2	4	-	21	3	3	13	-	-	-	10	42	31.3
Kanamycin (30 ug)		42	19	9	11	1	2	-	26	-	3	11	-	-	4	6	54	40.3
Neomycin (30 ug)		12	25	33	3	5	6	-	18	12	7	-	-	-	9	1	84	62.7
Gentamycin (10 ug)		19	12	39	6	4	2	2	8	4	10	18	-	-	3	7	93	69.4

- negative   + weak positive   ++ moderate sensitive   +++ highly sensitive.

Table (4)

Results of treatment of subclinically mastitic quarters according to sensitiviey tests

Isolated organisms	Antibiotic	No. of infected quarters	Cured post. No.	Cured quarters post treatment %
Strept agalactiae	Gentamycin	51	49	96.1
Strept. dys	Neomycin	6	3	50
Staph. aureus	Gentamycin	28	23	82.1
E.coli	Gentamycin	10	10	100