http://www.pjbs.org

PJBS

ISSN 1028-8880

Pakistan Journal of Biological Sciences

ANSInet
Asian Network for Scientific Information
308 Lasani Town, Sargodha Road, Faisalabad - Pakistan

Pakistan Journal of Biological Sciences 3 (1): 142-143, 2000
© Copyright by the Capricorn Publications, 2000

Relation Between Somatic Cell Count and Chemical Tests Used for Detection of Sub-clinical Mastitis in Buffaloes

S.A Soomro, K.B. Mirbahar, M.I.Memon, A.G. Arijo and N.M. Soomro
Department of Veterinary Physiology and Biochemistry,
Sindh Agriculture University, Tandojam, Pakistan

Abstract: To see the relation between somatic cell count (SCC) and intensity of Chemical reaction on White Side Test (WST), Bromothymol Blue Test (BTBT) and Chloride Test (CLT), a total of 785 milk samples were chemically tested using all three tests. Out of 785 samples 109, 155 and 124 showed positive reactions on WST, BTBT and CLT respectively. The positive samples were graded as + (4), + + (8), + + + (12) and + + + + (16) according to the severity of reaction and their relative somatic cells were counted. The results revealed direct relation between SCC and intensity of chemical reaction. Ninety one percent of samples with positive reactions on all three tests had SCC over $200x10^3$ which indicates that a SCC below $200x10^3$ may be regarded as normal in buffalo.

Key words: Mastitis, SCC, White Side Test, Bromothymol Blue Test and Chloride Test

Introduction

The diagnosis is essential for the control and prevention of sub-clinical mastitis. Various indirect tests have been described to detect the sub-clinical mastitis (Schalm *et al*., 1971). As evident from its definition, the mastitis is characterized by physical and bacteriological changes in milk causing an inevitable rise in somatic cell count (Blood and Radostitis, 1989).

In addition to the SCC examined under light microscope some screening tests are also commonly used for the detection of sub-clinical mastitis. These includes Bromothymol Blue Test (BTBT), Chloride Test (CLT) and White Side Tests (WST). WST is considered as dependant upon SCC (Blood and Radostitis 1989), where as BTBT detects changes in pH (Schalm *et al.,* 1971). Somatic cell count is regarded as the most reliable indicator for detection of sub-clinical mastitis .

A SCC count of less than $250x10^3$/ml of milk is considered as normal in Cow (Blood and Radostitis, 1989). However studies conducted by various scientists on buffalo milk have reported a SCC ranging from $100x10^3$ to $< 300X10^3$ to be normal (Silva and Silva, 1994; Dhakal *et al*., 1991; Disenhaus, 1985; Serieys, 1985).

Materials and Methods

A total of 785 milk samples were collected from 200 buffaloes by the method described by Coles (1968). The samples were than transported to the laboratory of Veterinary Physiology and Biochemistry, Sindh Agriculture University Tandojam. 4 percent NaOH, 0.13 percent silver nitrate and 10 percent potassium chromate and BTBT solutions were used in WST, BTBT and CLT respectively. The procedures were used as described by Schalm *et al*. (1971) and Coles (1968). Milk film was prepared and stained with Wrights-Leishman stain by method of Schalm *et al*. (1971).

The SCC were counted by field method i.e multiplying the number of cells in the fields (20) with working factor (30712.5) (Richardson, 1985). To facilitate statistical analysis the positive samples on chemical tests were classified as + (4), + + (8), + + + (12) and + + + + (16).

Results and Discussion

Most cases of the clinical mastitis are proceeded by sub-clinical type of mastitis. It is therefore important to detect mastitis at an early phase of development in order to make any mastitis control program successful. Some commonly used screening tests for the detecting of sub-clinical mastitis are WST, BTBT and CLT. Any physical and bacteriological change in milk causes, an inevitable rise in SCC (Blood and Radostitis, 1989). The relation between intensity of reaction of milk on indirect screening tests with their SCC is recorded in this study as to suggest most reliable and easy tests for used under field conditions. The comparison of positive samples on WST, BTBT and CLT with their relative percentage of different ranges of 5CC are shown in Table 1.

The results reveal direct relationship between SCC and severity of infection. Similar findings were described by Schalm *et al.* (1971). Table 2 shows percent of samples positive on all the three tests and their relative SCC. As shown 91 percent of samples showing positive reaction had SCC over $200x10^3$/ml. In this study a SCC of less than $200x10^3$/ml is considered normal. The findings of this study is in close agreement with that of Blood and Radostitis (1989), Dhakal *et al.* (1991) and Silva and Silva (1994).

This study revealed a good agreement between test scores

Table 1: Comparison of the Test Scores of Positive Samples on WST, BTBT and CLT with Their Relative Somatic Cell Count

Test Score	Total Samples	SCC (Nx100) %age				
		0-100	100-200	200-300	300-400	>400
WST						
4(+)	57	12	16	60	10	02
8(+ +)	34	03	00	23	62	12
12(+ + +)	15	07	00	00	33	60
16(+ + + +)	03	00	00	00	00	100
Total	109	08	08	39	29	16
BTBT						
4(+)	128	18	25	36	12	09
8(+ +)	21	05	05	24	38	28
12(+ + +)	06	00	00	00	33	67
16(+ + + +)	00	00	00	00	00	00
Total	155	15	21	33	17	14
CLT						
4(+)	83	11	18	51	14	06
8(+ +)	30	07	00	20	57	17
12(+ + +)	08	12	00	00	37	50
16(+ + + +)	03	00	00	00	00	100
Total	124	10	12	38	26	14

Table 2: Percent of the Samples showing Positive Reaction on All Three Tests SCC < $200x10^3$ and over $200x10^3$

Total samples	No.of +ve samples	SCC (Nx100) % age	
		0-200	Over 200
785	78	09	91

of positive samples on three chemical test and SCC. Thus it is concluded that any of three chemical tests can be used with reasonable reliability for the early detection of mastitis. However BTBT was found to be more sensitive.

References

Blood, D.C. and R.D. Radostitis, 1989. General Features of Mastitis. In: Veterinary Medicine Text Book of the Diseases of Cattle, Sheep, Pig, Goat and Horses, Blood, D.C. and R.D. Radostitis (Eds.). 7th Edn., Bailliere Tindall, London, pp: 501-507.

Coles, E.H., 1968. Mastitis diagnosis in Veterinary Clinical Pathology. 1st Edn., W.B. Saunders, Philadelphia.

Dhakal, I.I., M.P. Kapur and R.M. Bhardwaj, 1991. Diagnosis of sub-clinical mastitis in buffalo using somatic cell count and viable cell count. Indian Vet. J. Dairy Sci., 44: 858-856.

Disenhaus, C., 1985. Individual cow somatic cell count program report data and field utilization. Veterinary Bulletin, Abstract No. 2736 Vol. 56.

Richardson, G.H., 1985. Standard Methods of the Examination of DairyProducts. 15th Edn., American Public Health Assocition, Washington, DC., USA., pp: 219-223.

Schalm, O.W., E.J. Carrol and N.C. Jain, 1971. Mastitis Complex: A Brief Summery. In: Bovine Mastitis, Schalm, O.W., E.J. Carrols and N.C. Jain (Eds.). Lea and Febriger, Philadelphia.

Serieys, F., 1985. Individual cow somatic cell count: Interpretation for the diagnosis of intramammary infection. Veterinary Bulletin, Abstract, Vol. No. 2735, pp: 56.

Silva, I.D. and K.F.S.T. Silva, 1994. Total and differential cell counts in buffalo (*Bubalus bubalis*) milk. Buffalo J., 10: 133-137.