Theriogenology Insight: 3(2):47-51. December, 2013

DOI Number: 10.5958/j.2277-3371.3.2.001

Efficacy Evaluation of Herbal Teat Dip "Mastidip Liquid" in Sub-Clinical Mastitis in Crossbred Cows

K.B. Vala[1], M.J. Saxena[2], K. Ravikanth[3], A. Thakur[4], S. Maini[5*]

[1]Veterinary Officer, Anand, Gujarat
[2]R and D Team Ayurvet Ltd. Baddi, India

Abstract

The present investigation was conducted to evaluate the efficacy of herbal teat dip Mastidip Liquid (*supplied by m/s Ayurvet Ltd, Baddi, India*) in subclinical mastitic cows on the basis of restoration of altered milk pH and somatic cells count (SCC). Twenty crossbred cows screened positive for subclinical mastitis were selected and divided into two equal groups. Herbal teat dip Mastidip Liquidwas applied post milking in 1:1 dilution (one part concentrated solution + one part clean water) twice daily immediately after milking for a period of30 days in one group (II) and for 45 days in other group (III). One additional group of 10 intact cows were taken as normal control group (I). Milk samples were collected for SCC and pH examination before initiation of teat dipping and on 7,14,21,28, 35 and 49th day post application of teat dip. The pH and SCC was normalized and milk yield improved after treatment with Mastidip Liquid. In conclusion, post milking teat dipping withMastidip Liquidis found to be effective teat sanitizer in prevention of new intramammary infection in dairy cows and reducing the incidence of subclinical mastitis.

Keywords: Antimicrobial, intramammary, mastitis, sanitizer, teat dip.

Introduction

Incidence of intramammary infection is highly correlated to udder hygiene and sanitization and both pre- and post-milking teat antisepsis are the most effective procedures for udder sanitization preventing new intramammary infections (IMI) in dairy cows. Dipping or spraying the teats has been practiced for many years (Maiti *et al.,* 2004). These procedures involve dipping teats of dairy cows before and after milking with an appropriate germicidal preparation to reduce teat skin colonization and contamination with mastitis-causing bacteria and minimize penetration into the teat canal. Post-milking teat dip is probably the most important and effective management strategy for mastitis control to reduce the new intramammary infection rate in dairy cows. The aim of post-milking dipping is to remove any contagious mastitis-causing pathogens that may have been deposited on the teat surface - including any present just inside the opened teat canal - that are transferred during milking from infected milk

*Corresponding Author: shivi@ayurvet.in
MS Received: 7th April, 2013
MS Accepted: 29th August, 2013

residues, before they have chance to colonise and infect the teat (Woolford, 2001).Teat disinfection helps keep teat skin healthy and heal skin lesions, and these actions may be its most important contribution to mastitis control (Hillerton, 1997). Many field experiments have shown that effective post-milking teat disinfection lowers new infection rates of the cow-associated mastitis bacteria (*Staph aureus*a and *Strep agalactiae*) by 50% or more (Bramley 1992).The past decade has seen a significant increase in the use of herbal medicine due to their minimal side effects, availability and acceptability to the majority of the population. Even WHO has emphasized on the use of medicinal plants, as they are safer and cost effective than the synthetic drugs. Therefore, the present study was designed to evaluate theefficacy of herbal teat dip "Mastidip liquid" in sub-clinical mastitis in crossbred cows.

Materials and Methods

Experimental design

This study was performed at the field level on various farms in the Dist. Anand of Gujarat, India in the year 2010. Lactating cows in mid lactation were screened by mastitis detection strip (Mastrip), somatic cell count and bacteriological examination. Ten healthy intact cows and 20 cows exhibiting signs of sub-clinical mastitis were selected and divided into three equal groups. Group (I) was healthy intact control cows free from sub-clinical mastitis. Group (II) was cows positive for sub-clinical mastitis, subjected for herbal teat dip Mastidip Liquid post milking in 1:1 dilution (one part concentrated solution + one part clean water) twice daily immediately after milking for a period of one month. Group (III) was cows positive for sub-clinical mastitis subjected for herbal teat dip Mastidip Liquid post milking in 1:1 dilution (one part concentrated solution + one part clean water) twice daily immediately after milking for a period of 45 days.

Milk samples were collected from all cows using 30 ml oven dried glass bottles for pH and somatic cell count (SCC) on day '0', 7, 14, 21, 28, 35and 49th days post dipping. The product Mastidip liquid (*supplied by M/S Ayurvet Limited, Baddi, H.P., India*) comprises of herbs viz, *Berberis lycium*, *Curcuma longa*, *Eucalyptus globulus* and many others in a fixed concentration.

Parameters estimated

1. The milk pH was measured using pH strips in different groups of cows before ('0') and 7, 14, 21, 28, 35 and 49th day post dipping.
2. Somatic Cell Count (SCC) (Schalm *et al*., 1971)
3. Milk Yield (L/day).

All the animals were observed for maximum period of 49 days.

Statistical Analysis

The data was analyzed statistically by using Factorial Completely Randomized

Design (FCRD) as described by Snedecor and Cochran (1994). Data was analyzed by SAS and the comparison of mean was done with T-test.

Results

Milk pH

Mastrip test with a bromthymol strip was conducted to test absence or presence of subclinical mastitis in animals. The change of colour of strip in mastitic milk is correlated to change in Ph. The yellow colour of strip changes to green in subclinical mastitis & intense bluish green in clinical mastitis. Exact pH values couldn't e recorded with this test. Mastrip test revealed that the pH of control group was normal throughout the experiment. The milk pH of group II and III was alkaline before treatment but restored to normal on 28th day post dipping in both the groups indicating effectiveness of herbal teat dip in restoring normal pH.

Somatic Cell count

The average values of somatic cell count in different groups of cows before ('0') and 7, 14, 21, 28, 35 and 49th day post dipping were presented in Table (1). In group (I), the milk SCC ranged between 1.03 and 1.84 x 10^5 cells/ml, while it ranged at day 0 was 2.74 and 2.17 x 10^5 for groups II and III respectively. After application of herbal teat dip, the SCC showed decreasing trend at different intervals and restored its normal values on 35th day post dipping in both groups.

Milk Yield

In the present investigation, milk-yield of all cows were recorded up to 49th day. The average milk-yield recorded in intact and subclinical mastitic groups before

Table 1: Average values of milk SCC (x10^5cells/ml of milk) in intact and subclinical mastitic cows of different groups and intervals.

Groups \ Days	0	7	14	21	28	35	49
I	1.03	0.892	0.908	1.2278	0.98	1.2278*	1.84*
II	2.74	2.3	2.144	2.064*	1.965*	1.7*	1.2*
III	2.712	2.295	2.122	2.148*	1.965*	1.681*	1.62*

*The values differ significantly at P≤0.05

Table 2: Average values of milk yield(L/day) in intact and subclinical mastitic cows of different groups and intervals.

Groups \ Days	0	7	14	21	28	35	49
I	16.55	16.19	16.19	17.77*	17.14*	17.37*	15.41*
II	14.88	14.95	14.97	14.98	15.15	14.4	15.17*
III	14.19	14.8	14.83	14.84	14.92	14.99*	15.09*

*The values differ significantly at P≤0.05

(day 0) and 7, 14, 21, 28, 35 and 49th day post teat dipping were presented in Table (2). In intact group, the average milk yield was 16.55 L/day at day 0, whereas it being214.88 and 14.19 L/day for groups II and group III respectively, indicating decreasing pattern in subclinical mastitis groups. After herbal teat dipping, the milk yield increased at different intervals on day 49th by 1.9% and 6.3% in group II and III, respectively as compared to day 0.

Discussion

The major economic losses due to subclinical mastitis have been attributed with the loss of milk yield. The results of pH are in concordance with findings of Kolte *et al*. (1999), Waghmare *et al*. (2002) and Diami (2004). Milk constituents responsible for pH are casein, citrate, phosphate, dissolved CO_2 and bicarbonates which are balanced with permeability of udder cells to the blood capillaries. In mastitis due to mammary gland infection, increased permeability of the udder tissue to blood components viz., bicarbonate ions, results higher value of pH in the milk (Schalm *et al*., 1971; Rao, 1990). Joshi *et al*. (1976) suggested that increase in chloride concentration might be responsible for increase in pH of milk in subclinical mastitis.

The most significant indicator of subclinical mastitis is the increase in SCC. These results are in accordance with the findings of Sharma *et al.* (2000); Mukharjee and Das (2002) and Diami (2004). The increase in SCC in subclinical mastitis might be due to shift of leukocytes to the udder following inflammatory changes in the mammary gland as a protective mechanism against infection (Murcus *et al*., 1994). Thus, SCC has been used extensively as an indicator of degree of intramammary infection. Milk somatic cells consist of several cell types including neutrophils, macrophages and a smaller percentage of epithelial cells (Jones, 2006).

The constituent herbs of Mastidip liquid viz. *Berberis lycium, Curcuma longa and Eucalyptus globulus* are well known to possess antimicrobial, anti-inflammatory and immunomodulatory activities (Mukhopadhyay 1982; Sharma 2003; Bachir *et al*. 2008). These properties may be responsible for normalization of SCC and pH of the milk, thus leading to increase milk yield in subclinical mastitic cows.

Conclusion

Post milking herbal teat dip “Mastidip Liquid” is probably the most important and effective management strategy to reduce the new intramammary infection rate in dairy cows and “Mastidip Liquid” may be recommended after each milking for control and prevention of new mammary gland infection in dairy herd as teat dipping would reduce or eliminate organisms from the teat skin or orifice after milking.

References

Bachir, R.G., Benali, M., 2008. Antibacterial activity of leaf essential oils of Eucalyptus globulus. African Journal of Pharmacy and Pharmacology (AJPP), **2:**211-215.

Bramley, A.J, 1992. Mastitis and machine milking. In: Bramely AJ, Dodd FH, Mein GA, Bramley JA editors. Machine milking and lactation, Chapter 10. Insight Books, Vermont, United States 343-372.

Diami, S.G.R., 2004. Therapeutic Evaluation of Autogenous Vaccine with and without Herbal Drugs on Subclinical Mastitis in Cows. Thesis submitted to MAFSU, Nagpur.

Hillerton, J.E.,1997. Control of mastitis. In: Phillips CJC, editor. Progress in Dairy Science, CAB International, pp. 171-191.

Jones, G.M., 2006. Understanding the basics of mastitis. Virginia Cooperative Extension. Publication No. 404-233. Virginia State University, USA, pp: 1-7.

Joshi, H.C., Kumar, M., Saxena, M.J., Chhabra, M.B., 1976. Herbal gel for the control of subclinical mastitis Ind. J. Diary Sci, **49:**631:634.

Kolte, A.Y., Sadekar, R.D., Mode, S.G., Gawai, G.R., 1999. Comparative efficacy of indigenous medicinal plant preparation and Tilox in subclinical mastitis in cow. Ind. Vet. J. **76:**893-895.

Maiti, S.K., Sharma, Neelesh, Koley, K.M., 2004. Efficacy of post milking herbal teat dip in the control of mastitis in cows. Veterinary Practitioner. **5**(2):105-106.

Mukharjee, R., Das, P.K., 2002. Estimation of somatic cell count and total bacterial count (TBC) to predict intramammary infection. Round table conference of IAAVR, 36-39.

Mukhopadhyay, A., Basu, N., Ghatak, N., 1982. Anti-inflammatory and irritant activities of curcumin Analogues in rats. Agents Actions, **12:**508-515.

Murcus, E., Kehril, J.R., Dale, E.S., 1994. Factor affecting milk cell and their role in health of the bovine mammary gland. J. Dairy Sci., **77:** 619-627.

Neelesh, Maiti, S.K., Koley, K.M. 2004. Studies on the incidence of sub clinical mastitis in buffaloes of Rajnandgaon district of Chhattisgarh state. Vet. Practitioner. **5**(2):123-12

Rao, K.S.R., 1990. Milk formation- alteration in mastitis milk composition. Indian Dairyman, **42:** 314-316.

Schalm, O.W., Caroll, E.J, Jain, N.C., 1971. Bovine Mastitis, Lea and Febiger, Philadephia, USA.

Sharma, R., 2003. Medicinal Plants of India an Encyclopedia, Daya Publishing House, Delhi. pp. 33-34.

Snedecor, G.W., Cochran, W.G., 1994. Statistical methods: 8th Edn. IOWA state University Press, Amos, U.S.A.

Waghmare, S.P., Sadekar, R.D., Khan, I., Doiphode, V.L., Handa, A. 2002. Efficacy of "Cobactan L. C." in subclinical mastitis in cows with reference to effect on biochemical profile of milk. Ind. Vet. Med. J. **26:**113-115.