

# CONTROL OF SUBCLINICAL MASTITIS (SCM) IN COWS THROUGH APPLICATION OF AN HERBAL GEL

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## ABSTRACT

A study was undertaken to assess the effectiveness of Mastilep topical herbal gel, in the control of subclinical mastitis. The study was carried out during the period from August 1998 to September 1999 in four small dairy units in the Khanapara region of Assam and Meghalaya. The farms collectively had 89 cross-bred (Jersey X Local) cows, of which 34 cows were in their early stage of lactation, 21 in mid lactation, 16 in late lactation and the remaining 18 were dried off due to pregnancy. The overall prevalence of SCM was found to be 64.7 per cent. In farm 1, (antibiotic treated cows), out of 12 affected animals, 5 were cured using Pendisrin- SH or Vetclox Plus (commercially available intramammary antibiotic therapy). The non-recovered cows were treated with Gentamycin sulphate based on their antibiograms. Out of 18 cows each affected in two other farms 15 and 16 recovered after Mastilep treatment, showing a recovery rate of 88.3 and 88.8 per cent, respectively. SCM appeared on farm I in about four months after it remained free from SCM. On the other hand, the prevalence rates of farms II and III were lower and the incidence rate of SCM on farm III was zero, indicating that Mastilep had a protective effect too. After bacterial isolation *Staphylococcus aureus* alone was found to be the major mastitogen from the non-recovered cows in farm 1. *Staphylococcus aureus* along with *Streptococcus dysgalactiae* and *Streptococcus bovis* were also isolated from the other two farms.

**KEYWORDS:** Subclinical mastitis, mastilep, antibiotics, herbal therapy.

## INTRODUCTION

Mastitis in bovines has become extremely complex and costliest disease. It affects 50 per cent of the herd-population (Garg, 2001), inflicting an estimated annual loss of as high as Rs. 6053.21 crores in India (Dua, 2001). Due to lack of appropriate prophylactic measures, chemotherapy has been used to control mastitis since long. However antibiotic therapy often fails owing to their indiscriminate use and the ubiquitous nature of the mastitogens. Conventional antibiotic treatment is fast losing relevance due to development of resistance or cross-resistance to the antibiotics among the mastitis pathogens, cost consideration and undesirable residues in milk (Dutta and Buragohain, 1993). In contrary to these, the non-toxic nature, cost effectiveness and easy availability of herbal drugs, makes them a suitable alternative to the antibiotic therapy (Singh *et al.*, 2003). Keeping in view all these facts a study was undertaken to assess the effectiveness of Mastilep (AV/AMP/14), in the control of subclinical mastitis.

## MATERIALS AND METHODS

The study was carried out during the period from August 1998 to September 1999. Four small dairy units henceforth referred to as farms, in the Khanapara region of Assam and Meghalaya were selected for the study. The farms collectively had 89 cross-bred (Jersey X Local) cows, of which 34 cows were in their early stage of lactation, 21 in mid lactation, 16 in late lactation and the remaining 18 were dried off due to pregnancy.

Each farm was assigned a number as farms I, II, III and IV. Farms I, II and III had 18 lactating cows each and farm IV, 17 cows. Mastitis (clinical and subclinical) was detected by using Modified California Mastitis Test (MCMT; Sharma and Rajani, 1969).

### Treatment

Farm-I— One half of the affected cows were treated with Pendisrin-SH, 6ml tube (Sarabhai Chemicals, Vododara, Gujarat 390 007). Each tube containing Procaine Penicillin-G- 1,00,000 IU, Streptomycin Sulphate-100mg, Sulphamerazine-500mg and

Hydrocortisone Acetate-20mg. The other half of the cows were treated with Vetclox Plus (Sarabhai Chemicals). Each tube contained Ampicillin Sodium 75mg and Cloxacillin Sodium 200mg. Both the drugs were administered for three consecutive days intracisternally immediately after evening milking.

Administration of drug without bacteriological isolation, identification and drug sensitivity testing was done considering the fact that majority of the Indian dairy farmer usually administer these two or similar products whenever they consider that their cows were suffering from any form of mastitis.

Farm-II- The affected lactating cows on farm II were treated with Mastilep (Dabur Ayurved Ltd., Ghaziabad), also known as AV/AMP/14. Each 100gm of Mastilep contained *Glycyrrhiza glabra*- 5gm, *Curcuma longa*- 2gm, *Cedrus deodara*- 10gm, *Paederia foetida*- 5gm and Sulphur- 10gm in a gel base. The gel of a tube containing 125gm Mastilep was applied over the udder including the teats, after the evening milking in such a way so that the content of one tube was sufficient for three applications on three consecutive days. Mastilep was not applied over the udders of mastitis-negative cows.

Farm- III- Mastilep was applied over the udders including the teats of all the lactating cows on farm III, irrespective of mastitis affected or not. If any lactating cow was added to the already existing ones, Mastilep was applied similarly from day one.

Farm-IV- Cows on farm IV were kept as untreated control. Some of the lactating cows on farms I and II also served as healthy control.

The management and husbandry practices on each farm were allowed to continue on its own ways as they were in vogue earlier.

### Post-treatment Observation

The MCMT was carried out on the 7th and 14th day post-treatment and then regularly at two months interval till the experiment was terminated.

Bacteria from the non-recovered cows on farms I, II and III were isolated and identified by standard procedures (Baker, 1967 and Collins and Lyne, 1970).

Their antibiotic sensitivity was tested against a range of clinically used antibiotics in Drug Sensitivity Test Agar (HiMedia, Mumbai) by disc-diffusion method.

The non-recovered cows on farm I were treated as per their antibiograms. On farm II and III Mastilep was applied for five days (one and a half tube per cow) for the second time after 14 days of first application to the non-recovered cows.

The milk samples of the retreated cows were tested with MCMT only after two months of first test, conducted on the 7th day initial post-treatment.

## RESULTS AND DISCUSSION

Farm wise prevalence of mastitis among the cows has been shown in table 1. The overall prevalence was found to be 64.7 per cent. Binodkumari and Supekar (1992) and Buragohain and Dutta (1999) reported almost similar observation.

The results of MCMT, showing the prevalence and the incidence rates of mastitis (sub-clinical) are shown in table 2. On farm I only 5 out of 12 affected were cured (two by Pendisrin- SH and three by Vetclox plus). The non-recovered cows were treated with Gentamicin sulphate based on their antibiograms.

In farm II and III, 15 and 16 cows out of 18 affected in each farm, were cured with Mastilep after 14<sup>th</sup> day post-treatment, showing a recovery rate of 88.3 and 88.8 per cent, respectively. The present finding was similar with the findings of Maiti *et al.*, (1997) who reported 80 per cent recovery rate of SCM after application of Mastilep.

The findings in the table 2 also reveal that antibiotics, when rationally used, deliver their results. However, SCM appeared on farm I in about four months after it remained free from SCM. On the other hand, the prevalence rates of farms II and III were lower and the incidence rate of SCM on farm III was zero, indicating that Mastilep had a protective effect too. Sub-clinical mastitis was contained by Mastilep on farms II and III, especially on farm III, to great extent.

After bacterial isolation it was found that only *Staphylococcus aureus* were isolated from the non-recovered cows on farm II and III. However, besides

**Table 1:** Prevalence of mastitis on four farms

Farm No.	No. of Cows	No. of lactating cows			Prevalence of Mastitis		Negative to MCMT
		Early	Mid	Late	SCM(%)	CM	
I	24	10	5	3	12(66.6)	0	6
II	22	9	6	3	11(61.1)	0	7
III	22	8	5	5	12(66.6)	0	6
IV	21	7	5	5	11(64.7)	0	6
Total	89	34	21	16	46(64.7)	-	25

**Table 2:** Results of the Modified California Mastitis test on the treated and the control cows on four farms.

Tested on Day/month post-treatment	Number of lactating cows positive after treatment				Prevalence rate (farmwise)				Incidence rate (farmwise)			
	I(12)	II(11)	III(12)	IV(11)	I	II	III	IV	I	II	III	IV
7d	7	5	6	11	38.8	27.7	33.3	64.7	0	0	0	0
14d	7	3	2	11	38.8	16.6	11.1	64.7	0	0	0	0
2m	0	2	1	13	0	11.1	5.5	64.7	0	0	0	11.7
4m	0	2	1	13	0	11.1	5.5	76.4	0	0	0	0
6m	2	2	1	13	0	11.1	5.5	76.4	11.1	0	0	0
8m	4	3	1	14	11.1	11.1	5.5	76.4	11.1	5.5	0	5.8
10m	5	5	1	14	22.2	16.6	5.5	82.2	5.5	11.1	0	0

\*New lactating cows were added, replacing cows to be dried off. The difference, if any, was so less ( $\pm 1$ ) that the prevalence rate and the incidence rate were calculated with the same number of affected cows.

**Table 3:** Sensitivity of bacterial isolated from the non-recovered cows.

Farm	Isolate	No	Sensitivity					
			P	A	Cx	S	G	Cl
I	S. aureus	16	0	0	0	0	16	16
	Str. dysgalctiae	8	0	0	0	0	8	8
	Str. bovis	4	0	0	0	0	4	4
II	S. aureus	20	4	4	8	4	20	20
III	S. aureus	24	8	10	12	8	24	24

*Staph. aureus*, *Streptococcus dysgalactiae* and *Strep. bovis* were also isolated from the non-recovered cows on farm I. All the isolates were sensitive to gentamicin and chloramphenicol (Table 3).

From the findings of the present study it appears that the traditional antimastitic preparation are losing relevance in mastitis treatment because of the presence of a large number of mastitis causing organisms resistant to these products. Mastilep being a partially bactericidal agent also provides an alternative to Pendistrin-SH and Vetclox plus or any other preparations containing similar antibiotics.

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