EFFICACY OF HERBAL REMEDIES AS ALTERNATIVE TO ANTIBIOTICS IN DRY COW THERAPY

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ABSTRACT

A comparative trial was designed to evaluate the efficacy of topical herbal gel- Mastilep gel (M/s Ayurvet limited) instead of using antibiotics as a dry cow therapy. Total 30 Crossbred advance pregnant cow were selected, divided in to 3 groups T0, T1, and T2 having 10 numbers of cows in each. Group T0 was kept as control. In group T1, dry cow therapy started with herbal gel- Mastilep for 5 days (before drying off) and 5 days (after calving). In group T2 dry cow therapy was done by using Enrofloxacin, synthetic antibiotic injection (fortvira 30mg), 2 injection at 72 hour interval, I/M. Results revealed that in the control group (T0) SCC (X10^3) was increased from 183 on day 0 to 186 on 5th day and in absence of any treatment overall SSC further increased up to 203 on 3rd day after parturition. In Group T1, the overall SCC (X10^3) was reduced from 187 on day 0 to 147 on 3rd day after parturition. In group T2, the overall SCC (X10^3) was 189 on day 0 which reduced to 182 on 3rd day after parturition. On 3rd day after parturition, milk production (liter/day) was significantly more in group T1 (14.95) followed by group T2 (14.56) further followed by group T0 (10.96).

KEYWORDS: Mastilep gel, Somatic Cell Count (SCC), milk production.

INTRODUCTION

Mastitis is an inflammation of the mammary gland which, together with physical, chemical and microbiological changes, is characterized by an increase in the number of somatic cells in the milk and by pathological changes in the mammary tissue. Inflammations of the mammary glands, mastitis, are one of the most costly health issues faced by dairy farms. Mastitis is a global problem as it adversely affects animal health, quality of milk and the
The economics of milk production, affecting every country, including developed ones and causes huge financial losses.\textsuperscript{[2]} There is agreement among authors that mastitis is the most widespread infectious disease in dairy cattle, and, from an economic aspect, the most damaging.\textsuperscript{[3,4]} Mastitis, the most common multifactorial disease in the lactating cow has remarkably rising impact on Indian economy where over all losses due to mastitis is estimated to be Rs.7165.51 crores.\textsuperscript{[5,6]} In cows, mastitis is most frequently caused by a bacterial infection. Infections may be present in the clinical form characterized by visible abnormalities in the milk or the udder or in subclinical form characterized by inflammation of the mammary gland that does not create visible changes in the milk or the udder. Infections may not present as clinical cases during the dry period, there is a high risk that subclinical cases will become clinical after calving.\textsuperscript{[7]} In contrast, detection of mammary quarters with sub-clinical mastitis is more difficult because signs are not readily apparent\textsuperscript{[8]} and, because of the lack of any overt manifestation, its diagnosis is a challenge in dairy animal management and in veterinary practice. The sub-clinical form is 15 to 40 times more prevalent than the clinical form, and usually precedes the clinical form and is of long duration.\textsuperscript{[9]} It is important to emphasize that the sub-clinically affected animals remain a continuing source of infection for herd mates.\textsuperscript{[10]} There are different levels for detection of mastitis: an individual cow level in the herd, and a more large-scale testing for bulk milk.\textsuperscript{[8]} Regarding the individual cow level, the sub-clinical form of the disease can be detected by bacteriological examination and somatic cell counts (SCC).\textsuperscript{[11]} Various antibiotic based intra-mammary infusions for the both dry cow therapy and the treatment of mastitis are available. However the increasing emergence of antibiotic resistant pathogens.\textsuperscript{[12]} is further suspected to complicate the effectiveness of the mastitis treatment. Both pre and post milking teat antiseptics are the most effective management strategy for preventing new intra mammary infections in dairy cows. Prophylactic antibiotic dry cow therapy, administered at the end of lactation, aims to eliminate current and prevent future intra-mammary infections. Certified organic dairies are restricted from antibiotic use and thus must use an alternative or no dry cow therapy. Teat disinfection after milking is one of the five plans of mastitis control by National Institute of Research in to Dairying (NIRD).\textsuperscript{[13]} Several herbal extracts have shown in vitro antibacterial activity versus major mastitis pathogens.\textsuperscript{[14]} WHO has also emphasized on the use of medicinal plant, therefore the proposed study was to assess herbal product, Mastilep gel (M/s Ayurveda limited) for treatment or prevention of mastitis as alternative to antibiotics.
MATERIALS AND METHODS
The proposed study was carried out at dairy farm, Anand, Gujrat, to evaluate the efficacy of Mastilep gel and Antibiotics (Inj. Enrofloxacin 10mg/kg i/m repeat 72hrs Interval) in the treatment of Dry Cow Therapy. A total of 30 Crossbred cows were selected with the history of advance pregnant and near about dry off for next lactation. All the selected cows were reported to have a history of sub clinical or clinical mastitis in present lactation. The group T0 was kept as control and given no antibiotic or herbal therapy (no dry off treatment), treatment group T1 was treated with Mastilep gel, BID application for 5 days after dry off to be repeated after calving for 5 days and treatment group T2 given dry off therapy with Antibiotic, two Injection of Enrofloxacin at interval of 72 hrs after dry off. Duplicate quarter milk samples were taken immediately before dry treatment and three days post-calving. A change in bacterial presence between pre-treatment and post-calving samples for each cow was used to determine the efficacy of each treatment. A somatic cell count from the pre-treatment lactation and during the early part of the subsequent lactation was compared among treatments to determine practical effects of treatment. Therapeutic efficacy was determined on the basis of improvement in the somatic cell count, milk yield and milk fat content.

RESULTS AND DISCUSSION
The data shows the effect of the dry cow therapy was very much effective in the Mastilep gel treated group (T1) as compared to control group (T0) in terms of the incidence of mastitis. It was revealed that the somatic cell count was also reduced in the mastilep treated group (T1) and animal reach peak production in short time as compared with the control group (T0). The incidence of mastitis was different in Mastilep Gel treated group and Antibiotics treated group as compared to control group. But the somatic cell counts were less in Mastilep Gel treated group as compared to antibiotics Treatment groups (Table No 1). There was no significant difference in milk production in both treatment groups except control group. Decrease in the somatic cell count as well as increase in milk production may be due to presence of higher concentrations of flavonoids, saponins, glycosides, alkaloids and terpenoids in the extracts of Cedrus deodara \[15\] which have anti-bacterial, anti-fungal and anti-inflammatory properties and Curcuma longa (Turmeric), which is also constituent ingredient of herbal gel mastilep, possesses numerous pharmacological activities, including antioxidant and antimicrobial properties and its use for inflammatory conditions is also well known \[16\]. Bcteria such as S. aureus, S. agalactiae, E. coli and Pseudomonas aeruginosa are the most common etiological agents involved in subclinical cases of mastitis in dairy
cows\cite{17}. The antibacterial activities of essential oils from leaves of *Eucalyptus globules*, also a constituent ingredient of mastilep gel, was determined against *Staphylococcus aureus* Gram (+) and *Escherichia coli* Gram (-) bacteria.\cite{18} So the improvement in the milk production as well as SCC is may be due to consequent of pharmacological activity of the ingredients used in the herbal gel – Mastilep.

**Table No 1: Overall performance**

<table>
<thead>
<tr>
<th>Group name</th>
<th>Total No. of animals</th>
<th>No. of animals affected</th>
<th>% Animal affected in group</th>
<th>Average SSC (X10^3)</th>
<th>Average milk production per animal / day(lit)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control Group (T0)</td>
<td>10</td>
<td>4</td>
<td>40</td>
<td>203</td>
<td>10.96</td>
</tr>
<tr>
<td>Treatment Group (T1)</td>
<td>10</td>
<td>1</td>
<td>10</td>
<td>147</td>
<td>14.95</td>
</tr>
<tr>
<td>Treatment Group2</td>
<td>10</td>
<td>1</td>
<td>10</td>
<td>182</td>
<td>14.56</td>
</tr>
</tbody>
</table>

**CONCLUSION**

Efficacy of herbal gel- Mastilep, in the treatment of subclinical mastitis was good among the control and antibiotic treated group. Also the increase in the milk yield was more in the Mastilep gel treated group. Therefore application of the herbal-gel Mastilep may be recommended for the treatment and control of sub clinical mastitis in bovine.

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**REFERENCES**