

**THERAPEUTIC EFFICACY OF MASTACURE AND ITS
EFFECT OH CELLULAR IMMUNE RESPONSE IN BUFFALO
MASTITIS**

By

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CHAPTER-VI

Summary and Conclusion

The study was planned with respect to prevalence of sub clinical mastitis (SCM) by cultural examination and somatic cell count (SCC), assessment of therapeutic efficacy of Mastacure, a homeopathic medicine in buffalo mastitis, and to compare the cellular immune response of normal and mastitic animals along with the effect of Mastacure in modulation of immune response.

Prevalence rate on the basis of cultural examination alone was 13.48 per cent of the buffaloes and 7.90 per cent of the quarters examined. *Streptococcus agalactiae* was the most predominant organism isolated from sub clinical mastitis in buffaloes accounting for 35.71 per cent of the isolates followed by *Staphylococcus aureus* (28.57%), *Staphylococcus epidermidis* (21.43%) and *Streptococcus dysgalactiae* (14.28%). Mixed infection was observed in two quarters in combination of streptococci and staphylococci.

Five buffaloes having sub clinical mastitis were subjected to mastacure treatment for 20

days. Before treatment out of 20 quarters, 12 quarters were culturally positive for *Str. agalactiae* (9) and *S. aureus* (3). On day 5 post treatment 10 quarters (83.33%) revealed bacteriological cure and only two quarters were bacteriologically positive. On day 10 and 20 post treatment bacteriological cure decreased to 75.00 and 66.60 per cent, respectively. On day 30 post treatment bacteriological cure rate reached to 83.33 per cent. However, there was persistence of *Str. agalactiae* and *S. aureus* in one quarter each. Before the start of treatment all the 12 culturally positive quarters were showing SCC more than 5,00,000 per ml ranging from 54×10^4 per ml to 86×10^4 per ml whereas on day 30 only two quarters revealed SCC more than

5,00,000 per ml of milk. ,

The difference of mean SCC from five sub clinical mastitic buffaloes ($175.20 + 38.30 \times 10^4/\text{ml}$) and five healthy buffaloes ($20.4 + 3.76 \times 10^4/\text{ml}$) before the start of treatment with mastacure was found to be statistically significant ($P < 0.01$). The difference in mean SCC + SE per ml was also found statistically significant ($P < 0.05$) on day 5 post treatment whereas on day 10, 20 and 30 post treatment this difference in mean SCC + SE per ml was not found statistically significant ($P > 0.05$).

The T cell subpopulation (BoCD4⁺, BoCD8⁺ and B0WC1⁺ T cells) were analyzed in milk samples collected from five normal and five sub clinical mastitic buffaloes by flow cytometry. Milk from mastitic buffaloes revealed significant increase in BoCD4⁺ and BoWC 1⁺ T cells as compared to normal buffaloes ($P < 0.05$). An increase was also recorded in BoCD8⁺ cells of mastitic buffaloes as compared to normal buffaloes but this elevation was not significant ($P > 0.05$).

The mean ratio of BoCD4⁺ : B0CD8⁺ T lymphocytes in the milk of healthy animal were $0.9 + 0.03$. However, this ratio was lowered in buffaloes with sub clinical mastitis indicating the presence of higher proportion of BoCD8⁺ than BoCD4⁺ T lymphocytes in milk of mastitic buffaloes.

Analysis of T cell subsets in milk samples from normal buffaloes and mastitic buffaloes after administration of homeopathic medicine revealed down regulation of BoCD8⁺ T cells in milk from mastitic buffaloes on day 5 and then there was gradual increase which was found significant ($P < 0.05$) on day 20. After stopping the treatment, from 20 day onwards there was

slight increase in BoCD8⁺ cells which was not significant ($P>0.05$). Significantly ($P<0.05$) higher percentage of BoCD4⁺ lymphocytes on day 5,10 and 20 were found in the milk of mastitic buffaloes. This up gradation was highly significant ($P<0.01$) on day 5 post treatment. In contrast, slight increase was recorded on day 30 and this up regulation was not significant as compared to previous days.

BoWCF T lymphocytes in milk of mastitic buffaloes showed marked increase from day 5 to day 30. However, significant up gradation was encountered only on day 20 ($P<0.01$).

The mean ratio of BoCD4⁺: B0CD8+ T lymphocytes in milk after the start of homeopathic treatment indicated that the average value on day 5 I/and 10 was 2.4 and 2.16, respectively suggesting the higher proportion of BoCD4⁺ T lymphocytes in milk. However, this elevation was highly significant ($P<0.01$) on day 5 and significant on day 10. On day 20 there was an apparent reduction in mean ratio of BoCD4⁺: BoCD8" T lymphocytes but it remained more than one which is indicative of active immune response. This ratio was drastically reduced to less than one on day 30.

CONCLUSION

1. On the basis of cultural examination, animal and quarter wise prevalence of sub clinical mastitis was found to be 13.48 per cent and 7.90 per cent. Whereas on the basis of IDF criteria quarter wise prevalence was 4.50 percent. Equal occurrence of both staphylococci and streptococci (49.99%) was observed.
2. Mastacure was found to be highly efficacious (83.33%) in treating sub clinical mastitis in buffaloes. The medicine was found to be more effective against streptococci as compared to staphylococci and resulted in significant decrease in SCC.
3. Mastacure modulated the immune response by up regulating the proportion of BoCD4⁺ and BoWCI⁺ T cells in mastitic milk of buffaloes.
4. CD4: CD8 ratio could be said as indicators of susceptibility to bovine mastitis.