STUDY ON PUERPERAL MASTITIS

C.S. Aruna Man¹, R. Ramasamy² and S.R. Srinivasan³
Madras Veterinary College
Chennai- 600007

Periparturient period is the most stressful period to the dairy cows. The physical and metabolic stress of pregnancy, calving and lactation may contribute to the decrease in host resistance and the subsequent increase in disease incidence. One such disease, which is also economically important is mastitis.

Infectious mastitis begins, when microbes gain access to mammary gland and become established as an intramammary infection. Mastitis in early lactation is caused by opportunistic environmental pathogens like Coliform and Streptococcus (Hogan et al. 1989).

The study was conducted with this background to analyse about the various causes of puerperal mastitis.

Periparturient cows brought to Madras Veterinary College, Large Animal Outpatient Unit were screened for various periparturient diseases. Twelve animals showing signs of mastitis were taken for this study. Electrical conductivity of milk, culture of milk, selected haematological and serum biochemical analysis were done. Ten apparently healthy puerperal animals served as control.

The total and differential leukocyte counts in control and mastitis groups were as follows. WBC 9.22 ± 0.84 and 9.15 ± 1.07 (10³/cmm), Neutrophil 2.76 ± 0.17 and 3.62 ± 0.35 (10³/cmm), Lymphocyte 6.21 ± 0.76 and 5.49 ± 0.74 (10³/cmm), Eosinophil 0.21 ± 0.09 and 0.05 ± 0.04 (10³/cmm) and Monocyte 0.05 ± 0.04 and 0.03 ± 0.02 (10³/cmm) respectively.

The periparturient dairy cows with mastitis showed mature neutrophilia, lymphopenia, eosinopenia and monocytosis in some cases, which could be considered as a typical stress leukogram. The blood picture matched with the findings of Lee and kehrli (1998), who reported about the significant changes in blood leukocyte numbers around parturition.

Electrical conductivity of milk samples were noticed between 6.8 mS and 8.5 mS, according to the severity of the udder cell damage. This was in accordance with the reports of Norbergt et al. (2004).

Milk culture showed Coliform bacteria in 6 animals, Streptococcus sp. in 4 animals. The findings of the present study was comparable with the results of the previous study by Hogan et al. (1989).

The serum biochemistry showed decreased values of glucose and calcium (i.e) blood glucose of control and mastitis groups being 55.30 ± 3.13 and 50.83 ± 1.22 (mg/dL) and serum calcium being 9.01 ± 0.31 and 7.90 ± 0.29 (mg/dL) respectively. The serum calcium values had significant (p<0.05) difference. The present results were in accordance with the reports of Blum et al. (1983) and Oikawa and Katoh (2002).

Calder (1995) and Castell and Newsholme (1998) reported that glucose had positive effect on lymphocyte proliferation and for macrophage
phagocytosis. So, lymphocytopenia was attributable to lowered levels of glucose. Bashan et al. (1993) also reported that leukocytes use glucose as their main energy source.

Lowered level of calcium in postpartum cow was also an important cause for occurrence of mastitis. Role of calcium in proper contraction of muscle is well established. Huber et al. (1981) demonstrated that contraction rate and strength of the smooth muscle of intestinal tract was directly proportional to blood calcium concentration. That could be well applied to the teat sphincter, which is a smooth muscle. The teat sphincter contraction will not be proper in lowered levels of calcium, through which environmental pathogens can easily enter into the gland and cause mastitis.

Mallard et al. (1998) reported about the suppressed leukocyte activity around parturition. Lowered calcium might also be a cause for that, as intracellular calcium concentration is a command second messenger of many immune cell receptor mediated responses.

These changes show that occurrence of puerperal mastitis is of multifactorial aetiology (i.e.) the combined effects of negative energy balance, immunosuppression and hampered teat sphincter tonicity.

The study was conducted in periparturient animals, which showed signs of mastitis. On various clinical and biochemical analysis, they were found to have increased electrical conductivity of milk, reduced serum levels of calcium and glucose and a stress leukogram. The interpretations showed that the aetiology of mastitis was multifactorial like negative energy balance, immunosuppression, hampered teat sphincter tonicity which predisposed puerperal cows to the disease.

REFERENCES