BOVINE MASTITIS, AN ECONOMICALLY IMPORTANT BACTERIAL INFECTION OF UDDER IN CATTLE: A REVIEW

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ABSTRACT

Bovine mastitis is a multietiopathogenic condition of mammary gland affecting dairy cows and remains the most economically important disease of dairy industries around the world. It is characterized by physical, chemical and microbiological changes in the milk and pathological changes in the glandular tissues of the udder. The changes in the milk include changes of colour, consistency and presence of abnormally large number of leukocytes. Production per cow due to the clinical and subclinical prevalence of mastitis is usually recognized as the main pathway in causing the economic losses due to the disease (De Graves & Fetrow, 1993 and Schepers & Dijkstraen, 1991).

Key Words: Bacterial Infection, Mastitis and Mammary Gland and Milk

INTRODUCTION

Large numbers of infectious agents are responsible in causing the disease in dairy animals. Bacterial agents like Staphylococcus spp., Streptococcus spp., Escherichia coli, Corynebacterium spp., Klebsiella spp., Psudomonas spp., Mycoplasmal agents, fungal agents, viral agents are responsible for the disease (Radostits et al., 1995 and Nagal et al., 1999). About 95% of intramammary infections are caused by Staphylococcus spp. and Streptococcus spp. The remaining 5% are caused by other organisms (NAIP Sub-Project at PD-ADMAS). Staphylococcus aureus is a major pathogen in dairy cattle mastitis (Waage et al., 1998; Tenhagen et al., 2006 and Piepers et al., 2007). Streptococcal species isolated from dairy cows with clinical mastitis were obtained from mastitis research workers in Florida, Louisiana, New York, Vermont, Washington, and West Virginia.

Research reports on incidences of disease and involvement of multi-etiological agents

Reports from different parts of India indicate high prevalence of both subclinical and clinical mastitis in dairy herds (Dutta & Rangnekar, 2001). Frequency of occurrence of mastitis is influenced by different managemental, environmental and genetic factors. Klstrup et al., (1987) estimated that 25% of susceptibility to infection is attributed to environmental factors, 20% to genetic factors and 50% to herd management. Therefore prevalence of mastitis can be used as a litmus test to judge the management practices and hygienic conditions of any organized dairy farm. Though there are a long list of microorganisms are held to be responsible for the disease, but the most common pathogens are Staphylococci spp., and Streptococci spp.

Firat and Uysal (1986) isolated the organisms from 406 cows with clinical and subclinical cases of mastitis. Out of 390 isolates which showed CMT positive, 132 (34%) were coagulase positive Staphylococci, 63 (16%) coagulase negative Staphylococci, 51 (13%) gram negative bacteria, 28 Streptococcus agalactiae, 27 Streptococcus uberis, 22 Streptococcus faecalis and 21 Streptococcus dysgalactiae.

Konte et al., (1988) reported one year observation on mastitis in dairy herds of pure bred Monthbeliar and Pakistani Zebu near Dakar, 28 cases yield 20 bacterial species, the commonest being Staphylococcus aureus (50%) and E. coli (36%). Nine cases of mixed infection with 2-5 species were considered to have developed after treatment failure in single infection.

Waage et al., (1990) examined milk samples taken from 2491 quarters of 2233 cows with acute clinical mastitis and were found that Staphylococcus aureus predominated (48%), followed by enterobacteria (18%), Streptococcus dysgalactiae (12%), Str. uberis and Actinomyces pyogenes (3% each) and other streptococci (4%).

Lafi et al., (1994) claimed that the most common organism isolated from clinical cases of mastitis was coagulase positive Staphylococcus spp.

Turutoglu et al., (1995) examined 1594 mastitis milk samples and yielded aerobic bacteria from 1126 samples. Among the positive samples Staphylococcus aureus was 28%, Staphylococcus epidermidis 23%, Streptococcus agalactiae 19%, E. coli 8%, Streptococcus dysgalactiae 4%.

Pampero (2000) found that out of 190 milk samples, 174 samples were positive for bacterial growth. 88 (50.57%) yielded Staphylococci, 81 (45.55%) Streptococci and 5 samples (2.87%) yielded mixed growth of gram positive rods and gram negative cocci.

Ghose et al., (2001) cultured bacteriologically 13 milk samples, 11 (84.6%) yielded one type of bacteria in the remaining 2 samples (15.4%) mixed infection was observed. Among the bacterial mastitogens Staphylococcus aureus (33.3%) was the
major agent followed by Streptococci agalactiae (26.7%), Corynebacterium spp. (20%), Streptococcus dysgalactiae (13.3%) and Staphylococcus epidermidis (6.7%).

Ghose and Sharda (2004) obtained 168 (15.85%) milk samples out of 1060 bacterial growth on cultural examination. A total of 224 isolates were obtained, out of which 74 (33.04%) were characterized as Streptococcus spp., i.e. Str. agalactiae (58.11%), Str. pyogenes (20.27%), Str. dysgalactiae (18.92%) and Str. uberis (2.7%).

Balakrishnan et al., (2004) isolated a total of 40 bacterial isolates. The spectrum of organisms was Staphylococcus aureus (35%), Escherichia coli (27.5%), Streptococcus agalactiae (17.5%), Pseudomonas aeruginosa (12.5%), Streptococcus dysgalactiae (2.5%), Pasteurella haemolytica (2.5%) and Actinobacillus capsulatum (2.5%).

Kheirabadi et al., (2008) reported that subclinical bovine mastitis in west Iran was mainly caused by coagulase positive Staphylococcus aureus and Streptococcus agalactiae.

CONCLUSION
It has been estimated that mastitis reduces milk yield by approximately 21% and butter fat by 25% in affected cattle as compared to normal one. The milk of the infected cow turns inferior in quality and the milk of the affected cow is unfit for human consumption.

REFERENCES


