**BOVINE MASTITIS INFECTION**

Ankita1\*, Dr. Manjusha Tyagi2

1Research scholar, Department of Microbiology, SGRR School of basic and applied sciences, SGRR University Dehradun-248001, (ankitaak85@gmail.com)

2Associate Professor,Department of Microbiology, SGRR School of basic and applied sciences, SGRR University Dehradun-248001, (manjushatyagi2008@gmail.com)

**Abstract:** Dairy Industry is very much affected by a mastitis disease. Mastitis is defined as an infection of the udder, mainly caused by bacterial pathogen entering the quarter through the teat end. During mastitis infection cow shows an inflammation of the mammary glands and udder tissue. Mastitis infection results in 30% less productivity in dairy Industry. The economic losses of India due to mastitis infection is increased about 115 fold in last five decades. Mastitis pathogens are of two types i.e. contagious and environmental organisms. Contagious mastitis pathogen exists in udder skin and lesions of teat for a long time and they are transmitted from milking machine.The contagious mastitis is caused by *Streptococcus aureus* and *Streptococcus agalactiae*. *Streptococcus dysgalactiae* is an example of environmental pathogen. Environmental mastitis pathogens are found in the digestive tract of cattle, soil, manure that includes *E*. *coli, Klebsiella pneumoniae* and *Streptococcus uberis* etc. For the prevention of mastitis infection commonly antimicrobial therapy is used but there has been an increase in bacterial resistance against such antibiotics. Many bacteria are showing resistance to several antibiotics like *E.coli* to cephalosporins, *K. pneumoniae* to cephalosporin and carbapenems, *Staphylococcus aureus* to beta lactam antibacterical drug.The herbal medicine have a certain advantage i.e. non-toxic, lesser side effect and act selectively enhancing body resistance Various medicinal plants are used for the treatment of mastitis disease includes *Allium sativum, Azadirachta indica, Triticum aestivum* etc. Synergism of plant compound also plays an important role in antimicrobial agent. It has many properties like increased reduction of undesirable effects, high efficiency, increased bioavailability, and therapeutic effect at lower doses.

**Keywords: Contagious mastitis,** **Environmental mastitis, *Streptococcus aureus, E*. *coli, Klebsiella pneumonia,* Antimicrobial therapy, Cephalosporin**

**Introduction**

Bovine Mastitis is a mammary gland infection. Reduced the milk yield and its quality as well. Dairy Industry is very much affected by this disease Bovine mastitis has been ranked as number one in the most expensive disease of dairy animals in all over the world.Bovine mastitis is an economic burden for farmers because of decreased milk yield, premature culling, cost of veterinary treatments, and other factors. Mastitis leads to changes in milk composition, which is dependent on the inflammatory response.( Korhonen H, Kaartinen L.,1995). It is a painful condition, with serious implications in animal welfare and is one of the most important reasons for cows to prematurely leave the herd. Milk from animals with mastitis cannot be used for human consumption because it has altered chemical composition and organoleptic proprieties (Seegers et al., 2003; Adkins and Middleton, 2018; Ashraf and Imran, 2018).Mastitis is characterized by physical, chemical and bacteriological changes in the milk and pathological changes in the glandular tissue of the udder (Radostits*etal.,* 2000).

**Types of bovine mastitis**

According to the severity of the inflammation, mastitis can be classified in clinical or subclinical forms. In clinical mastitis,visible manifestations of infection are present, such as abnormal milk (changes in color, presence of clots, flakes), abnormal mammary gland (changes in tissue color, swelling) and changes in animal status (body temperature, appetite, and hydration level).

On the other hand, subclinical mastitis is characterized by the absence of detectable clinical signs. Still, milk quality and production yields are usually negatively affected (Adkins and Middleton, 2018; Ashraf and Imran, 2018).

**Transmission**

* Transmitted by repetitive contact with the milking machine and through contaminated hands or materials.
* Via the oral-to-udder transmission among calves. mastitis causing bacteria strain in the oral cavity of the calf where it will stay dormant until it is transmitted elsewhere.
* In wet muddy condition
* Wrong milking techniques and poor milking hygiene.

**Etiology**

A wide variety of microorganisms has been implicated as causative agents of bovine mastitis including bacteria, viruses, mycoplasma, yeasts and algae.(Chaneton L, Tirante L, Maito J, Chaves J, Bussmann LE.2008)

The majority of mastitis is of bacterial origin and just a few of species of bacteria account for most cases, such as *Escherichia coli, Staphylococcus aureus, Streptococcus uberis, Streptococcus dysgalactiae*and *Streptococcus agalactiae, Streptococcus bovis*and *Klebsiella pneumonia.(*Kuang Y, Tani K, Synnott AJ, Ohshima K, Higuchi H, Nagahata H, et al.2009*)*

Mastitis caused by E. coli is generally transient and disease outcome

largely depends on host factors, for example, lactation stage (Burvenich et al., 2003), energy balance (Suriyasathaporn et al., 2000),vitamin deficiency (Smith, Hogan, & Weiss, 1997) and vaccination status.Staphylococcus aureus is a commensal skin microbe, causes mild to acute disease condition in man and animals. In man S. aureus may cause disease like skin infections, septicaemia, infective endocarditis and septocarthritis.(Lowy FD.1998). In animal it causes bovine mastitis in dairy cattle and buffaloes.(Dolma T, Mukherjee R, Pati B K, De U K.2014)

**Losses due to mastitis**

 The losses are either due to temporary or permanent loss of milk production, poor milk quality, discarding of milk from affected animals prior to or after antibiotic treatment and pre-mature culling of the cow or reduced productive life of animals.

 The loss of milk production is not just restricted during the course of the disease but may continue throughout the life of the animal because of the permanent damage that mastitis can cause to the mammary secretary tissues.

The milk from the suffering animal generally carries microbial load that renders it unsuitable for human consumption. There is a considerable increase in the somatic cell count in milk of cows and buffaloes suffering from mastitis. It is, therefore, important that India undertakes a nationwide plan to prevent and control mastitis.

**Conclusion**

The view that infection is the primary cause of mastitis is supported by the findings that (a) mastitis can be produced experimentally by injection of udders with known etiologic agents; (b,) infection is usually associated with mastitis, and (c) predisposing factors contribute to mastitis mainly by increasing the chances for infection to occur or by lowering the resistance of infected quarters, thereby increasing the rate of mastitis.

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