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Research Article

EXPERIMENTAL DETECTION OF BACTERIAL INFECTION IN COW MILK

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ABSTRACT

The present study was undertaken for isolation and identification of *Staphylococcus aureus* obtained from cases of bovine mastitis. The antibiotic sensitivity pattern of isolates of *Staphylococcus aureus* was studied. Molecular characterization of *Staphylococcus aureus* was done by Sodium dodecyl sulphate polyacrylamide gel electrophoresis (SDS-PAGE).

Keywords: Mastitis, *Staphylococcus aureus*, Antibiotic sensitivity, SDS-PAGE

INTRODUCTION

Mastitis, inflammation of the mammary gland, can have an infectious and non-infectious etiology¹. It is characterized by physical, chemical and usually bacteriological changes in the milk and pathological changes in the glandular tissue of the udder and affects quality and quantity of milk².

Mastitis is usually caused by bacteria that invade the udder, multiply and produce toxins which are harmful to the mammary gland³.

MATERIALS AND METHODS

For this purpose 75 milk samples were obtained from cases of bovine clinical mastitis. These samples were received directly from the farmers and from organized private dairy farms in and around Ranchi.

RESULTS AND DISCUSSION

Out of 75 milk samples the percentage of *Staphylococcus spp.* was 53.33 percent, out of which percentage of Coagulase positive and coagulase negative *Staphylococcus spp.* were 28% and 25.33% respectively. The prevalence of Staphylococcal mastitis was the highest among the mastitis caused by other bacteria. *Staphylococcus aureus* and *Staphylococcus epidermidis* (Coagulase negative *Staphylococcus*) were identified on basis of their cultural characteristics, morphology and staining characteristics and biochemical profile.

The drug sensitivity test of 21 Isolates of *Staphylococcus aureus* showed that Ciprofloxacin was most effective antibiotic followed by Tetracycline, Kanamycin, Amikacin, Chloramphenicol, Gentamicin, Streptomycin and Co-trimoxazole in decreasing order. The organisms were moderately sensitive to Cephalexin and Nitrofurantoin but highly resistance to Ampicillin.

Similarly, 19 isolates of *Staphylococcus epidermidis* were subjected to antibiotic sensitivity test where Ciprofloxacin, Tetracycline, amikacin, Gentamicin, Kanamycin, Chloramphenicol and Co-trimoxazole were effective. The organisms were moderately sensitive to Nitrofurantoin, but highly resistance to Cephalexin and Ampicillin.

When the whole cell protein of 21 isolates of *Staphylococcus aureus* were subjected to SDS PAGE against protein marker, we got 26 protein bands range from 207.90 KDa to 6.10 KDa having broad similarities. But 4 bands i.e. 36.35 KDa, 31.16 KDa, 24.05 KDa and 19.49 KDa were highly expressed in 8 out of 21 isolates. When the whole cell protein of 19 isolates of *Staphylococcus epidermidis* were subjected to SDS PAGE against protein marker, we got 14 protein bands range from 239 KDa to 14.08 KDa having broad similarities. But 2 bands i.e. 69.09 KDa and 32 KDa were highly expressed in all the isolates.

CONCLUSION

The prevalence of Staphylococcal mastitis was the highest i.e. 53.33% among the mastitis caused by other bacteria. In Staphylococcal mastitis the overall incidence of Coagulase positive *Staphylococci spp* i.e. *Staphylococcus aureus* was 52.5% higher than Coagulase negative *Staphylococci spp* i.e. *Staphylococcus epidermidis* (47.5%). Drug sensitivity test revealed that Ciprofloxacin was highly effective in both *S. aureus* and *S. epidermidis*. Whole cell protein profile analysis of *S. aureus* and *S. epidermidis* showed broad similarity in band pattern except 4 bands (36.35 KDa, 31.16 KDa, 24.05 KDa and 19.49 KDa) and 2 bands (69.09 KDa and 32 Kda) respectively were highly expressed may be due to some strain variation or mutation or antibiotic resistance and virulence. Cause of protein band variations can be further analyzed by western blotting and other immunological techniques.

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