Response of *Staphylococcus aureus* of Bovine Origin to Sublethal Concentrations of Antibiotics: Altered Susceptibility Profile.

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INTRODUCTION: Reports have shown that the administration of antibiotics in suboptimal concentrations produces undesired effects on bacteria exemplified by increased biofilm production and virulence factors secretion. *Staphylococcus aureus* is the main etiologic agent associated with subclinical bovine mastitis, a dairy cattle disease usually treated with antibiotics. Here we evaluated the influence of subinibitory concentrations of antibiotics used in the treatment of mastitis on the phenotypic mutation frequencies that were determined by resistance to rifampicina and on the susceptibility of *Staphylococcus aureus* to antimicrobial agents. MATERIAL AND METHODS: The effect of ampicillin, gentamicin, and tetracycline on phenotypic mutation frequency was evaluated by the exposure of *S. aureus* strains to 0.25X, 0.5X, and 0.75X minimum inhibitory concentration for the three antibiotics and plating on rifampicin-containing media. For this purpose, bacteria were grown in BHI medium and milk, with or without addition of antibiotic. Change in the susceptibility profile of *S. aureus* was assessed after serial passage of bacteria in sublethal doses of antibiotics followed by plating on rifampicin-containing media. RESULTS AND DISCUSSION: All sublethal concentrations of gentamicin tested increased the phenotypic mutation frequency regardless of the culture medium. In the milk medium, increase was dose dependent. All doses of ampicillin promoted an increase in the phenotypic mutation frequency only in isolate 4125 in both culture medium. Tetracycline increased phenotypic mutation frequency only in BHI. Streptomycin, gentamicin, and penicillin equivalent to 0.5X inhibitory concentration increased bacterial resistance up to 100 times. CONCLUSION: Sublethal concentrations of antibiotics increased up to 106 times the phenotypic frequency of mutation in *S. aureus* and modified susceptibility of the cultures to different antimicrobials.

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