Molecular Characterization of Resistance Bacterial Strains to Silver in Burning

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Background & Objectives: Silver is an effective, broad-spectrum antimicrobial agent commonly incorporated into topical creams and wound dressings to manage wound infection. Despite the medical benefits of using ionic silver to manage infections, concern has been raised regarding the potential for development of bacterial resistance and an association with cross-resistance to antibiotics has been implied. The silver resistance determinant from plasmid pMG101 contains nine genes and the functions for eight named genes and their corresponding protein products have been assigned primarily on the basis of homologies to known proteins for other metal resistance. In this research encoding genes of the SilE protein is a small periplasmic metal binding protein, SilCBA constitute a three-polypeptide membrane potential-driven cation/proton exchange complex, the SilF periplasmic chaperone protein that is thought to carry Ag+ from its periplasmic site and SilP, is predicted to be a P-type ATPase were studied by specific PCR in plasmid and chromosomal DNA of isolated strains.

Methods: About of 100 samples were collected from burning. Then the isolated strains were identified and evaluated them MIC to Ag+ by dilution broth methods. PCR was applied with specific designed primers for genes located on plasmids, but also sometimes found encoded on the chromosome.

Results: Bacterial Ag+ resistance has been reported repeatedly but the genetic basis was not understood clearly recently. Presences of silE genes were approved in 17%, silP genes were approved in 18.5%, silS genes were approved in 4%. Identification of sil E, P, S, plasmid genes in isolated strains from burning and studying them is one of the goals of this projects.

Keywords: Sil Gene; MIC; PCR