

Variations in 2DE Protein and Antibiotic Resistance Profile of *Staphylococcus Aureus* After Sub-lethal Povidone-Iodine(Betadine) Stress

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Background & Objectives: *Staphylococcus aureus* is one of the most common causes of nosocomial and community acquired infections. Antimicrobial resistance of *S. aureus* continues to be a concern for clinicians worldwide. Environmental Stresses can affect the growth rate and population of bacteria. The aim of this study was to investigate the effects of Sub-lethal Povidone-Iodine (Betadine) stress on the antimicrobial drug resistance and proteome change of *S. aureus*.

Methods: *Staphylococcus aureus* (ATCC 25823) was grown in trypticase soybroth at 37°C. Cells in the exponential growth phase were gradually exposed to sub-lethal stress Povidone-Iodine with concentrations ranging from 3% and 10% (wt/vol). Bacterial cells were harvested and re-suspended in a tube containing 0.5mL of saline. Evaluation of antimicrobial drug resistance pattern revealed significant differences in zone sizes between the test and control suspensions under stress by using the disk diffusion methods. The pooled proteins from each condition were analyzed using two-dimensional gel electrophoresis (2DE).

Results: *S. aureus* exposed to Povidone-Iodine stress showed significant changes in resistance to Chloramphenicol and methicillin compared to the unstressed cells ($p=0.01$). Furthermore, analysis of pooled proteins between control and stressed cells showed changes in the protein-spot by using two-dimensional gel electrophoresis and image analysis.

Conclusion: Results of this study has been shown that Povidone-Iodine (Betadine) stress can be changed protein profile and antimicrobial resistance of *S. aureus*.

Keywords: *Staphylococcus aureus*; Stress; Antibiotic Resistance; Proteome