THE EFFECT OF SILVER ON WOUND HEALING

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Aim: To determine if there is an optimum level of silver which can be incorporated into wound dressings in order to retain its antimicrobial properties without being detrimental to the wound healing process.

Methods: We examined the effects of silver concentration on bacterial cell death and cell viability using in vitro models. Antimicrobial properties were determined using a Log10 reduction assay and were confirmed by zone of inhibition assays. Cell viability of fibroblasts, endothelial cells & keratinocytes was measured using a standard XTT proliferation assay.

Results: The results illustrate that Collagen/ORC + silver was the only dressing of those tested which had a positive effect on cell proliferation, while retaining its ability to reduce bacterial bioburden. It was found to be effective against common wound pathogens and resistant strains. Other silver-releasing dressings were found to cause significant cytotoxicity to all 3-cell types tested.

Discussion: Historically silver –containing therapies have been used topically to help manage bioburden, however while silver is an excellent broad spectrum antimicrobial, excessive levels or usage on non-infected wounds may cause a cytotoxic effect on host cells and have a negative overall effect on wound healing. When clinical infection is diagnosed it is imperative to treat this condition with an appropriate antimicrobial. However, in all other instances using a therapy such as Collagen/ORC + silver, would offer an ability to manage bacterial bioburden while also providing an environment to enhance cell growth. These in vitro studies suggest that Collagen/ORC + silver is an ideal therapy for delayed or non-healing chronic wounds especially when wounds are not clinically infected.