

MODULATION OF BACTERIAL – MEDIATED INFLAMMATION BY ADVANCED WOUND THERAPIES

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Aim: To determine if advanced wound dressings exacerbate or negate the excessive or persistent inflammation caused by stimuli such as bacteria in a chronic wound.

Methods: We developed an in vitro model of bacterial mediated inflammation using THP-1 cells, which were stimulated with bacterial endotoxins. Using this model we examined the ability of advanced wound therapies to affect the production of inflammatory cytokines. TNF-alpha and other inflammatory cytokines were measured using standard ELISA techniques and micro-array analysis.

Results: The results demonstrate that the Collagen/ORC + silver matrix was capable of reducing the levels of pro-inflammatory cytokines induced by bacterial endotoxins. This effect was not observed with similar levels of silver alone, and with other silver-releasing dressings. Furthermore the high silver-releasing dressings caused significant inflammatory cell death, and were therefore unable to elicit a positive effect on the inflammatory cycle.

Discussion: It is well documented that non-healing or chronic wounds are trapped in the inflammatory phase of healing and are characterised by inflammatory cells remaining at the wound site. These cells continue to release pro-inflammatory cytokines, free radicals and proteases in response to many stimuli including the presence of bacteria, resulting in an exacerbation of the chronic non-healing state. Our results demonstrate that collagen/ORC +silver matrix is unique among those dressings tested in that it can negate this effect. This suggests that Collagn/ORC + silver not only helps control bacterial bioburden but can also help reduce bacterial-mediated inflammation.