

DIFFERENTIAL CELL DEATH PROGRAMMES INDUCED BY SILVER DRESSINGS IN VITRO

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Aim: In past decades the gold standard for topical burn treatment was the use of silver sulfadiazine. Its toxicity due to silver, the cream base itself or a combination of both, negatively influences the wound healing process. Therefore, the healthcare industry searched for alternatives. In recent years, various dressings containing silver have become available to wound professionals. Although these have been reported to be a significant improvement, the dressings still show residual cytotoxicity. Given the ongoing debate about whether and how these dressings influence cell survival, this work endeavours to clarify some of the mystique surrounding the subject.

Methods: Various commercially available silver-type dressings were co-cultured in transwells with different cells. After an incubation of several hours, cells were collected and tested for cytotoxicity by MTT analysis. Flow cytometric analysis was performed to analyse the number of cells in apoptosis and necrosis.

Results: Our observations show that within two hours, for all dressings tested, cultures suffered significant cell death. Flow cytometric analysis showed that the hydrocolloid based silver dressing treated cultures had more cells in late apoptosis/necrosis compared to multilayered, carboxymethylcellulose or alginate based dressings. A polyurethane based silver dressing was least detrimental, probably due to its high absorptive capacity and thus lesser silver releasing capacity. The influence on the fibroblast cells was less pronounced as compared to the keratinocyte cells.

Conclusions: Our results showed that silver dressings, through diffusion, induce rapid death in cells that are involved in wound healing. We therefore recommend the use of silver dressings only on critically contaminated wounds rather than use on a de facto basis.