

PROTECTIVE EFFECT OF POLIHEXANIDE ON HACAT KERATINOCYTES IN CO-CULTURE WITH STAPHYLOCOCCUS AUREUS

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Introduction: Staphylococcus aureus is one of the most important pathogen of nosocomial infections and is common complication during the treatment of chronic wounds. Polihexanide is regarded first choice for the treatment of critical colonized or infected chronic wounds because of its good skin tolerance beside its antimicrobial effects. Furthermore, we investigated the influence of polihexanide human keratinocytes and fibroblast and found a positive influence on cell proliferation. Hence, we have used a co-culture system of HaCaT keratinocytes and Staphylococcus aureus to test the capacity of polihexanide to protect the cells from the bacterial damage.

Material & Methods: HaCaT keratinocytes were cultured with increasing concentrations of Staphylococcus aureus and with or without the addition of polihexanide and an extract of a polihexanide containing biocellulose wound dressing* in different concentrations. Viability and proliferation of HaCaT-cells was investigated by means of the ATPLite™-M kit (Perkin Elmer). The luminometric ATP assay is based on the detection of light generated by the ATP dependent enzymatic conversion of D-luciferin by luciferase. Staphylococcus aureus was quantified via staining with SYTO-9 (Molecular Probes).

Results: Increasing Staphylococcus aureus concentrations had a distinct negative effect on HaCaT cell viability and proliferation. Polihexanide in increasing concentrations was able to prevent cell damage and restore normal cell proliferation.

Conclusions: Polihexanide seems to be an ideal antimicrobial substance in wound dressings for treating chronic wounds because of its low cytotoxicity, good skin tolerance and positive influence on proliferation. Thus, the addition of polihexanide to a co-culture of HaCaT keratinocytes and Staphylococcus aureus protects the cells from the bacterial damage and allows normal cell growth.

*Suprasorb® X+PHMB