

NO RESISTANCE AFTER 100 DAYS REPEATED INCUBATION ON STAPHYLOCOCCUS AUREUS WITH POLIHEXANIDE

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Aim: Wound dressings with antiseptics are increasingly utilized in the treatment of critical colonized or infected chronic wounds. Antiseptics have a lower potency to induce bacterial resistance than antibiotics; however, concerns have been expressed regarding their overuse and the emergence of bacterial adaptation. We have used an experimental system employing microplate-laser-nephelometry to test the adaptation capacity of *S. aureus* to polihexanide and silver nitrate.

Methods: *S. aureus* was incubated with polihexanide and silver nitrate. Bacterial growth was measured by laser-nephelometry and antiseptics' IC50 concentrations were determined. Subsequently, the microorganisms were repeatedly incubated with 0.2µg/mL polihexanide and 5µg/mL silver nitrate for 100 days. Additionally, a polihexanide* and a silver** containing dressing have been tested according to the JIS L 1902 standard for antibacterial activity using untreated and treated *S. aureus*.

Results: IC50 of polihexanide increased only slightly over time ($m=0.002$) in contrast to silver nitrate ($m=0.087$). Determination of antimicrobial activity revealed a slight decrease in the effectiveness of the silver wound dressing** against the treated *S. aureus* about 20%. The polihexanide containing dressing* showed a similar microbial growth reduction capacity of 100% using treated and untreated *S. aureus*.

Conclusions: The IC50 for silver nitrate was found to increase with repeated treatment of *S. aureus*. The clinically very effective silver dressings are microbicidal and should be used for short-term only in critically-contaminated or infected wounds due to a possible risk of adaptation after a longer treatment period. Polihexanide showed a much lower potency to induce adaptation in *S. aureus*. Therefore, polihexanide seems to be an appropriate antimicrobial substance in wound dressings for treating chronic wounds.

* Suprasorb®X+PHMB/Lohmann & Rauscher

** Suprasorb®A/Lohmann&Rauscher