



ORIGINAL ARTICLE

Colloidal silver: a novel treatment for *Staphylococcus aureus* biofilms?

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Background

Colloidal silver is an alternative medicine consisting of silver particles suspended in water. After using this solution as a nasal spray, the symptoms of a previously recalcitrant *Staphylococcus aureus* (*S. aureus*)-infected chronic rhinosinusitis patient were observed to have improved markedly. The aim of this study was to determine whether colloidal silver has any direct bactericidal effects on these biofilms *in vitro*.

Methods

S. aureus biofilms were grown from the ATCC 25923 reference strain on Minimum Biofilm Eradication Concentration (MBEC) device pegs, and treated with colloidal silver. Concentrations tested ranged from 10 to 150 μL colloidal silver diluted to 200 μL with sterile water in 50 μL cerebrospinal fluid (CSF) broth. Control pegs were exposed to equivalent volumes of CSF broth and sterile water. The sample size was 4 biomass values per treatment or control group. Confocal scanning laser microscopy and COMSTAT software were used to quantify biofilms 24 hours after treatment.

Results

Significant differences from control were found for all concentrations tested bar the lowest of 10 μL colloidal silver in 200 μL . At 20 μL colloidal silver, the reduction in biomass was 98.9% (mean difference between control and treatment = $-4.0317 \mu\text{m}^3/\mu\text{m}^2$, $p < 0.0001$). A maximum biomass reduction of 99.8% was reached at both 100 and 150 μL colloidal silver (mean differences = -4.0681 and $-4.0675 \mu\text{m}^3/\mu\text{m}^2$, respectively, $p < 0.0001$).

Conclusion

Colloidal silver directly attenuates *in vitro* *S. aureus* biofilms.

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