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Silver colloidal nanoparticles: antifungal effect against adhered cells and biofilms of *Candida albicans* and *Candida glabrata*.

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Source

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Abstract

The aim of this study was to evaluate the effect of silver nanoparticles (SN) against *Candida albicans* and *Candida glabrata* adhered cells and biofilms. SN (average diameter 5 nm) were synthesized by silver nitrate reduction with sodium citrate and stabilized with ammonia. Minimal inhibitory concentration (MIC) tests were performed for *C. albicans* (n = 2) and *C. glabrata* (n = 2) grown in suspension following the Clinical Laboratory Standards Institute microbroth dilution method. SN were applied to adhered cells (2 h) or biofilms (48 h) and after 24 h of contact their effect was assessed by enumeration of colony forming units (CFUs) and quantification of total biomass (by crystal violet staining). The MIC results showed that SN were fungicidal against all strains tested at very low concentrations (0.4-3.3 µg ml⁻¹). Furthermore, SN were more effective in reducing biofilm biomass when applied to adhered cells (2 h) than to pre-formed biofilms (48 h), with the exception of *C. glabrata* ATCC, which in both cases showed a reduction ~90%. Regarding cell viability, SN were highly effective on adhered *C. glabrata* and respective biofilms. On *C. albicans* the effect was not so evident but there was also a reduction in the number of viable biofilm cells.

In summary, SN may have the potential to be an effective alternative to conventional antifungal agents for future therapies in *Candida*-associated denture stomatitis.

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