



Br J Dermatol. 2005 Jun;152(6):1235-42.

Topical nanocrystalline silver cream suppresses inflammatory cytokines and induces apoptosis of inflammatory cells in a murine model of allergic contact dermatitis.

Bhol KC¹, Schechter PJ.

Author information

Abstract

BACKGROUND: Nanocrystalline silver has both antimicrobial and anti-inflammatory properties. However, the exact mechanisms underlying these activities are not known.

OBJECTIVES: The objectives of this study were to assess the anti-inflammatory effects of nanocrystalline silver using a murine model of allergic contact dermatitis, compare the effects with those of tacrolimus and a high potency steroid, and to relate the effects to modulation of pro-inflammatory cytokines and apoptosis of inflammatory cells.

METHODS: Dermatitis was induced on the ears of BALB/c mice using dinitrofluorobenzene. Topical treatment, including vehicles, 1% nanocrystalline silver cream, tacrolimus ointment and a high potency steroid, was applied once a day for 4 days. Ear swelling was measured and the erythema was evaluated daily. After 4 days of treatment the mice were killed and samples from the ears were collected for histological and immunohistochemical examination, terminal deoxynucleotidyl transferase (TdT)-mediated dUTP-biotin nick end labelling (TUNEL) staining and extraction of total RNA for reverse transcriptase polymerase chain reaction (RT-PCR).

RESULTS: Significant reductions of ear swelling, erythema and histopathological inflammation in mice ears were observed after 4 days of treatment with 1% nanocrystalline silver cream, tacrolimus ointment or a high potency steroid with no significant difference among them. Both RT-PCR and immunohistochemical staining of sections from ear biopsies demonstrated that nanocrystalline silver, tacrolimus and steroid significantly suppressed the expression of tumour necrosis factor (TNF)-alpha and interleukin (IL)-12. TUNEL staining demonstrated a significant increase in the numbers of apoptotic cells in material from the group treated with nanocrystalline silver when compared with that from groups treated with vehicle, tacrolimus or steroid.

CONCLUSIONS: This study demonstrates that nanocrystalline silver inhibits allergic contact dermatitis in mice, similar to steroid and tacrolimus. Nanocrystalline silver suppresses the expression of TNF-alpha and IL-12 and induces apoptosis of inflammatory cells; mechanisms by which nanocrystalline silver may exert its anti-inflammatory effects.

PMID: 15948987 DOI: [10.1111/j.1365-2133.2005.06575.x](https://doi.org/10.1111/j.1365-2133.2005.06575.x)

[PubMed - indexed for MEDLINE]

Publication Types, MeSH Terms, Substances

LinkOut - more resources

PubMed Commons

[PubMed Commons home](#)

0 comments

[How to join PubMed Commons](#)

