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Future Science

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Carboxymethyl cellulose/poloxamer gels enriched with essential oil and Ag nanoparticles: promising wound dressings

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Abstract

Aim: Essential oils are promising antibacterial and wound-healing agents that should be explored for the design of wound dressings. **Materials & methods:** Topical gels prepared from a combination of carboxymethyl cellulose and poloxamer were incorporated with tea tree and lavender oil together with Ag nanoparticles. *In vitro* release, cytotoxicity, antibacterial, and wound healing studies were performed. **Results:** The gels displayed good spreadability with viscosity in the range of 210–1200 cP. The gels displayed promising antibacterial activity against selected Gram-positive and Gram-negative bacteria used in the study. The % cell viability of the gels was more than 90.83%. **Conclusion:** The topical gels displayed excellent wound closure *in vitro* revealing that they are potential wound dressings for bacteria-infected wounds.

Plain language summary

What is this article about?

This article reports the efficacy of carboxymethyl cellulose-based topical gels loaded with a combination of essential oils and silver nanoparticles as potential wound dressings for bacterial-infected wounds.

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The topical gels induced a faster rate of closure than the untreated cells in 96 h. The gel formulations did not induce any significant cytotoxic effect. They were effective against Gram-negative and Gram-positive bacteria used in the study.

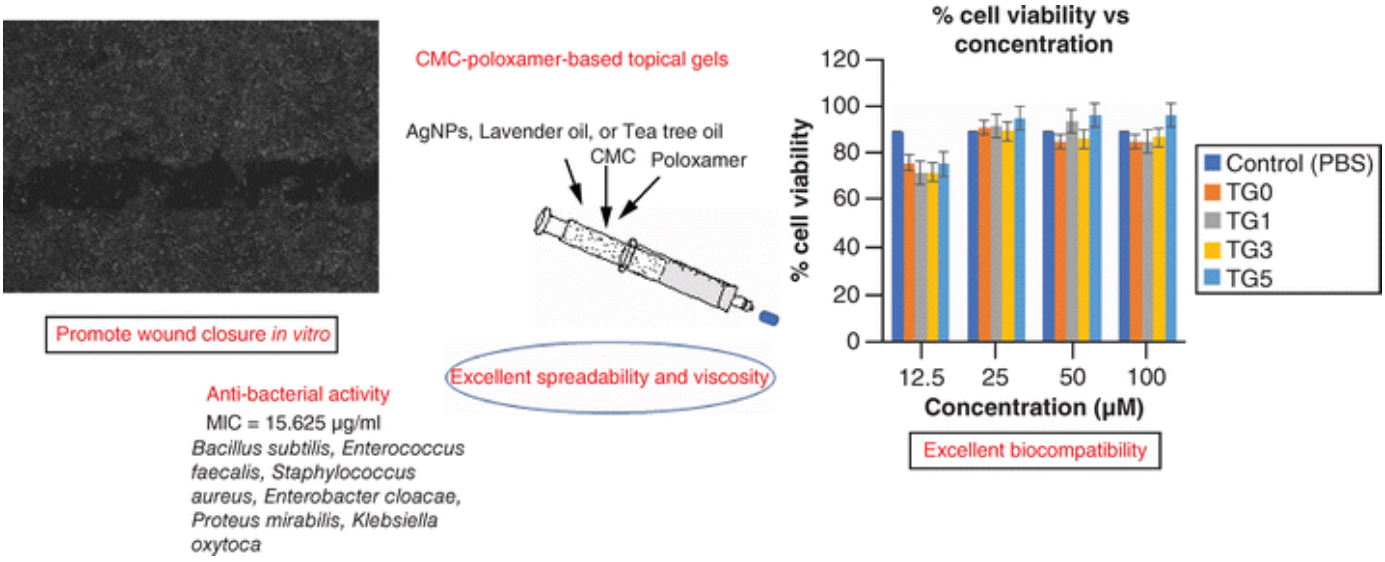
What do the results of the study mean?

The topical gels displayed promising healing effects *in vitro* revealing that they are potential wound dressings for treating bacteria-infected wounds.

Tweetable abstract

Click to tweet CMC-based topical gels loaded with a combination of essential oils and silver nanoparticles are promising wound dressings for treating bacterial-infected wounds.

Graphical abstract



Keywords: CMC • essential oils • lavender oil • polymers • silver nanoparticles • topical gels • wounds

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