

Research Abstract

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Research Article: Current Concepts in Menthol-based Topical Analgesics for Pain Relief (Abstract)
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Current Concepts in Menthol-based Topical Analgesics for Pain Relief

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Purpose: The American College of Rheumatology promotes topical analgesics as a primary therapy for arthritis disorders. The purpose of this presentation is to review the scientific basis for the use of menthol-based topical analgesics for temporary pain relief.

Methods & Results: A literature review was performed to examine the mechanism of action and effectiveness of menthol as a temporary pain reliever. Topically-applied menthol produces a cooling sensation in 80% of subjects, while others experience warming. Menthol produces similar effects of cryotherapy, including increased pain threshold and increased cutaneous microcirculation. Limited clinical studies have shown significant pain reduction with menthol-based topical analgesics in patients with arthritis, sports injuries, headaches, and post-herpetic pain. Classically, menthol's mechanism of action was considered to result from a counter-irritant effect by stimulating sensory receptors to suppress the perception of painful stimuli. This mechanism is more commonly known as the Gate Control theory of Melzak and Wall, where larger-diameter nerve fibers inhibit pain signals from smaller fibers. More recently, however, researchers have discovered that menthol stimulates specific cold receptors identified as TRPM8 receptors. These receptors are essentially protein channels that decrease the flow of calcium ions, causing a perception of cold. Furthermore, research has shown that these TRPM8 receptors actually stimulate the small-diameter c- and A-delta nerve fibers, rendering the classic counterirritant effect less likely. This receptor mechanism is thought to occur in the central nervous system either through endogenous opiates or through glutamate receptors in the spinal cord. Unfortunately, much of the research on these mechanisms occurs in animals rather than humans. Although more research is needed, menthol may be promising in the management of persons with neuropathic pain since chronic pain often mediated in the central nervous system.

Conclusion: Menthol has been used for many years for the temporary relief of pain. Recent discoveries on its mechanism of action may pose new opportunities in the field of pain management; however, more research is needed, particularly in patient populations.

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