Topical vs Systemic Capsaicin for Burning Mouth Syndrome: A Systematic Review of Efficacy and Safety

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Abstract

Objective: Compare the efficacy and tolerability of topical versus systemic capsaicin for managing burning mouth syndrome (BMS).

Methods: PRISMA 2020–guided systematic review of PubMed, Epistemonikos, Cochrane Library, and Lens (inception–Nov 25, 2025). Adults with primary BMS treated with topical or systemic capsaicin were eligible; primary outcomes were pain intensity, response rate.

Results: 2 RCTs and 2 single-arm pilots (120 patients) met inclusion criteria. Topical capsaicin reduced pain short-term, but higher concentrations caused dropout rates up to 53.3% from mucosal burning.

Conclusion: Both routes provide short-term relief of BMS symptoms, but each carries route-specific toxicities.

Introduction & Methods

Background

- Burning mouth syndrome (BMS) is a chronic intraoral burning pain without visible mucosal lesions
- Pathophysiology involves small-fiber neuropathy and trigeminal / dopaminergic dysfunction
- Capsaicin, a TRPV1 agonist, defunctionalizes nociceptors, providing long-term analgesia
- Comparative efficacy and tolerability of topical vs systemic capsaicin remain unclear

Methods

- PRISMA 2020–guided systematic review
- PICOS: adults with primary BMS; topical or systemic capsaicin; placebo/control or single-arm design; VAS pain intensity and response rate (primary), adverse events and completion (secondary).
- Four databases searched (inception–Nov 25, 2025): PubMed, Epistemonikos, Cochrane Library, Lens

Results

Study Selection & Characteristics

- 346 records were screened
- After exclusions, 4 studies (120 analyzed patients) met inclusion criteria (Table 1).

Study	Route	Concentration	N	Design
Silvestre 2012	Topical	0.02% rinse	23	RCT (cross-over)
León Espinosa 2004	Topical	0.025% gel	7	Pilot
Spanemberg 2011	Topical	0.002% mouthwash	40	Pilot
Petruzzi 2004	Systemic	0.25% capsules	50	RCT (parallel)

Table 1. Study Characteristics

Efficacy

- Topical 0.02% rinse (Silvestre 2012): significant VAS reduction vs baseline (P=.003 AM; P=.002 PM); placebo showed no change.
- Topical 0.002% mouthwash (Spanemberg 2011): 75% partial response, 22.5% complete remission, 0 dropouts.
- Topical 0.025% gel (León Espinosa 2004): only 2 of 7 completers achieved complete response; 53% discontinued from burning.
- Systemic 0.25% capsules (Petruzzi 2004): 80–93% of active-group patients improved vs 0% placebo (P<.001).

Adverse Events & Tolerability

- Topical: burning risk was concentration-dependent: 0% at 0.002%, ~33% transient burning at 0.02%, and 53% discontinuation at 0.025%.
- Systemic: no oral burning, but 32% (8/25) developed severe epigastric pain vs 0% placebo (P<.05); no dropouts over 30 days.

Conclusions

- Across 4 studies (120 patients), topical capsaicin reduced pain but caused **concentration-dependent mucosal burning**
- Systemic capsaicin produced **significant short-term relief** (P<.001) but caused severe epigastric pain
- Both routes attenuate BMS symptoms, but clinical utility is limited by route-specific adverse effects
- **Ultra-low-concentration topical rinses balance tolerability and efficacy**, representing a favorable route of administration

Limitations

- Pseudorandomization/randomization of two studies
- Small initial population and high dropout rates of some studies
- Inconsistent outcome-reporting metrics across each study
- Certainty of evidence is low to very low

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IRB/IACUC: Not applicable – this systematic review analyzed previously published data and did not involve new human or animal subjects research.

References