25TH NATIONAL & 11TH INTERNATIONAL ANNUAL CONGRESS
ON RESEARCH AND TECHNOLOGY OF IRANIAN MEDICAL SCIENCES STUDENTS
URMIA UNIVERSITY OF MEDICAL SCIENCES, URMIA, IRAN

A Systematic Review of Clinical Evidence for Topical Metformin: An Old Medication with a New Application

Kimia Afshar[1], Sara Adibfard[1], Mohammad Hossein Nikbakht[2], Fereshte Rastegarnasab[1], Mahsa Pourmahdi-Boroujeni[1], Bahareh Abtahi-Naeini[3*]

[1]Student Research Committee, Isfahan University of Medical Sciences, Isfahan, Iran
[2]Student Research Committee, School of Dentistry, Isfahan University of Medical Sciences, Isfahan, Iran
[3]Skin Diseases and Leishmaniasis Research Center, Isfahan University of Medical Sciences, Isfahan, Iran

OPEN ACCESS

***Corresponding Author:**
Skin Diseases and Leishmaniasis Research Center, Isfahan University of Medical Sciences, Isfahan, Iran

Citation:
Afshar K, Adibfard S, Nikbakht MH, Rastegarnasab F, Pourmahdi-Boroujeni M, Abtahi-Naeini B. A Systematic Review of Clinical Evidence for Topical Metformin: An Old Medication with a New Application. *Iranian biomedical journal*. Supplementary (12-2024): 262.

ABSTRACT

Introduction: Metformin is a widely used oral agent for controlling diabetes mellitus, but it also has other therapeutic benefits for various conditions. In addition, conventional oral and topical metformin has been used in in vitro studies to treat acne, psoriasis, and wound healing. While topical metformin has shown promising results in animal studies, there are limited data on its effectiveness in humans. Our study aimed to summarize the clinical findings of human studies on the efficacy of topical metformin.

Search Strategy: A systematic search was conducted in PubMed, Scopus, Web of Science, and Embase until December 31, 2022, using the following search strategy, which was limited to title and abstracts and did not employ any filters: “topical” OR “cream” OR “ointment” OR “lotion” OR “gel” OR “paste” AND “metformin”. We reviewed and screened the papers based on their titles, abstracts, and full texts. Additionally, we checked related review articles to identify any relevant studies that may have been missed. Furthermore, we examined the references of the selected studies from the full-text screen to locate any additional articles that may have been overlooked.

Results: Our search strategy yielded 1555 articles. After screening, 19 articles met our inclusion criteria, which were human studies, articles published before the start of the search, and topical forms of metformin. We also identified three additional relevant articles through reference checking. Overal, our systematic review included a total of 22 articles.

Conclusion and Discussion: Topical metformin has primarily been studied in the fields of dentistry and dermatology. In dentistry, it has proven effective in treating periodontitis when used on conjunction with scaling and root planning. The combination of metformin and platelet-rich fibrin offers enhanced benefits for teeth affected by furcation involvement, while coating dental implants with metformin has been shown to improve osseointegration. In dermatology, research on melasma has yielded inconsistent results. However, topical metformin has demonstrated promising outcomes in promoting hair regrowth and facilitating wound healing, suggesting its potential as a treatment option for hair loss and wound recovery.

Keywords: Dermatology, Metformin, Periodontitis, Wound healing

[DOI: 10.61186/ibj.25th-11th-IACRTIMSS]