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Scoping Review Protocol: Changes in Skin Microbiome Post-Dermatological Interventions V.1

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We use this protocol and it's working

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Abstract

This scoping review protocol aims to systematically map the existing literature on the effects of common dermatological procedures on the skin microbiome. Adhering to PRISMA-ScR guidelines, we will conduct a comprehensive search in PubMed for studies published from 2007 onwards, focusing on various dermatological interventions such as grafts, laser surgery, and micropigmentation, while excluding studies involving topical treatments or systemic interventions. Screening will identify primary research articles that report changes in skin microbiome composition pre- and post-intervention. The review will provide a narrative summary and visual data representations, identifying key findings, research gaps, and implications for future research and clinical practice.

Introduction

- 1 The skin microbiome is an ecosystem of microorganisms residing on the human skin which play a crucial role in maintaining skin health and protecting against pathogens(1). This community includes bacteria, fungi, viruses, and mites, which interact with each other and the host forming a dynamic equilibrium. Disruptions of this balance can lead to various dermatological conditions, including acne(2), atopic dermatitis(3), and psoriasis (4). Recent advances have highlighted the significant impact of dermatological interventions, such as topical antibiotics on the composition and function of the skin microbiome(5). However, there remain gaps in the understanding of how dermatologic procedures affect the proximal skin microbiome. Here we propose a protocol for undertaking a scoping review aimed at capturing the current research on the effects of common dermatological procedures on the skin microbiome.

Research Question

- 2 We will perform a scoping review to describe the available evidence on the changes in skin microbiome composition following dermatological procedures.

Methods

- 3 This protocol will follow the guidelines held by the PRISMA-ScR (Preferred Reporting Items for Systematic reviews and Meta-Analyses extension for Scoping Reviews) checklist(6).
- 3.1 The search strategy entails query of the PubMed database of article published from 2007 to the present. Key terms included in the search using the advanced search tool as follows: ((acne surgery) OR (excisional biopsy) OR (excision) OR (debride) OR (injection) OR (tattoos) OR (micropigmentation) OR (graft) OR (laser surgery) OR (electrosurgery) OR (cryosurgery) OR (chemosurgery) OR (surgical curettement) OR (phototherapy) OR (dermabrasion) OR (chemical peel) OR (chemical cauterization) OR (mohs) OR (skin peel) OR (electrolysis) OR (radiation)) AND (skin microbiome).
The search strategies were based on dermatology CPT/HCPCS procedures.
Did not include interventions involving topical creams, ointments, emollients, and moisturizers.
- 3.2 Screening:
After the initial search, each paper's titles, abstracts, and keywords are to be screened by one reviewer who selects papers matching the inclusion criteria.

Inclusion criteria:
Published 2007 and after (HMP launched in 2007).
The term "skin microbiome" or "skin microbiota" in the title, abstract or keywords.

Must discuss physical dermatological interventions (see definition).

Exclusion criteria:

Must be written in English.

Can not be a systematic review, scoping review, book or book chapter.

Excluded if reporting on bacteriotherapy or use of prebiotics, or post-biotics.

Excluded if intervention is topical ointments, creams, emollients, and moisturizers.

Excluded if intervention is intravenous, oral, or other systemic interventions.

Must evaluate the effect on skin microbiome and not be a treatment for dysbiosis or other related issues.

3.3 Eligibility:

A full paper review is conducted on the remaining papers. Articles were deemed eligible for inclusion if they were primary research and provided data on skin microbiome composition pre- and post-dermatological interventions outlined above.

3.4 Data Lines:

From the included articles reviewers will extract data from the articles following a pre-specified extraction sheet. The following data lines will be extracted from each paper into an MS Excel spreadsheet:(1) author;(2) year of publication;(3) dermatological intervention description;(4) study subjects;(5) study duration;(6) skin condition;(7) outcome.

References

- 4 1. Dréno B, Araviiskaia E, Berardesca E, Gontijo G, Sanchez Viera M, Xiang LF, Martin R, Bieber T. Microbiome in healthy skin, update for dermatologists. *J Eur Acad Dermatol Venereol*. 2016 Dec;30(12):2038-2047. doi: 10.1111/jdv.13965. Epub 2016 Oct 13. PMID: 27735094; PMCID: PMC6084363.
2. Bilal H, Xiao Y, Khan MN, Chen J, Wang Q, Zeng Y, Lin X. Stabilization of Acne Vulgaris-Associated Microbial Dysbiosis with 2% Supramolecular Salicylic Acid. *Pharmaceuticals (Basel)*. 2023 Jan 8;16(1):87. doi: 10.3390/ph16010087. PMID: 36678584; PMCID: PMC9864713.
3. Lee SY, Lee E, Park YM, Hong SJ. Microbiome in the Gut-Skin Axis in Atopic Dermatitis. *Allergy Asthma Immunol Res*. 2018 Jul;10(4):354-362. doi: 10.4168/aair.2018.10.4.354. PMID: 29949831; PMCID: PMC6021588.
4. Olejniczak-Staruch I, Ciężżyńska M, Sobolewska-Sztychny D, Narbutt J, Skibińska M, Lesiak A. Alterations of the Skin and Gut Microbiome in Psoriasis and Psoriatic Arthritis. *Int J Mol Sci*. 2021 Apr 13;22(8):3998. doi: 10.3390/ijms22083998. PMID: 33924414; PMCID: PMC8069836.

5. SanMiguel AJ, Meisel JS, Horwinski J, Zheng Q, Grice EA. Topical Antimicrobial Treatments Can Elicit Shifts to Resident Skin Bacterial Communities and Reduce Colonization by *Staphylococcus aureus* Competitors. *Antimicrob Agents Chemother*. 2017 Aug 24;61(9):e00774-17. doi: 10.1128/AAC.00774-17. PMID: 28630195; PMCID: PMC5571303.
6. Tricco AC, Lillie E, Zarin W, O'Brien KK, Colquhoun H, Levac D, Moher D, Peters MDJ, Horsley T, Weeks L, Hempel S, Akl EA, Chang C, McGowan J, Stewart L, Hartling L, Aldcroft A, Wilson MG, Garritty C, Lewin S, Godfrey CM, Macdonald MT, Langlois EV, Soares-Weiser K, Moriarty J, Clifford T, Tunçalp Ö, Straus SE. PRISMA Extension for Scoping Reviews (PRISMA-ScR): Checklist and Explanation. *Ann Intern Med*. 2018 Oct 2;169(7):467-473. doi: 10.7326/M18-0850. Epub 2018 Sep 4. PMID: 30178033.

Protocol references

1. Dréno B, Araviiskaia E, Berardesca E, Gontijo G, Sanchez Viera M, Xiang LF, Martin R, Bieber T. Microbiome in healthy skin, update for dermatologists. *J Eur Acad Dermatol Venereol*. 2016 Dec;30(12):2038-2047. doi: 10.1111/jdv.13965. Epub 2016 Oct 13. PMID: 27735094; PMCID: PMC6084363.
2. Bilal H, Xiao Y, Khan MN, Chen J, Wang Q, Zeng Y, Lin X. Stabilization of Acne Vulgaris-Associated Microbial Dysbiosis with 2% Supramolecular Salicylic Acid. *Pharmaceuticals (Basel)*. 2023 Jan 8;16(1):87. doi: 10.3390/ph16010087. PMID: 36678584; PMCID: PMC9864713.
3. Lee SY, Lee E, Park YM, Hong SJ. Microbiome in the Gut-Skin Axis in Atopic Dermatitis. *Allergy Asthma Immunol Res*. 2018 Jul;10(4):354-362. doi: 10.4168/aa.2018.10.4.354. PMID: 29949831; PMCID: PMC6021588.
4. Olejniczak-Staruch I, Ciężyńska M, Sobolewska-Sztychny D, Narbutt J, Skibińska M, Lesiak A. Alterations of the Skin and Gut Microbiome in Psoriasis and Psoriatic Arthritis. *Int J Mol Sci*. 2021 Apr 13;22(8):3998. doi: 10.3390/ijms22083998. PMID: 33924414; PMCID: PMC8069836.
5. SanMiguel AJ, Meisel JS, Horwinski J, Zheng Q, Grice EA. Topical Antimicrobial Treatments Can Elicit Shifts to Resident Skin Bacterial Communities and Reduce Colonization by *Staphylococcus aureus* Competitors. *Antimicrob Agents Chemother*. 2017 Aug 24;61(9):e00774-17. doi: 10.1128/AAC.00774-17. PMID: 28630195; PMCID: PMC5571303.
6. Tricco AC, Lillie E, Zarin W, O'Brien KK, Colquhoun H, Levac D, Moher D, Peters MDJ, Horsley T, Weeks L, Hempel S, Akl EA, Chang C, McGowan J, Stewart L, Hartling L, Aldcroft A, Wilson MG, Garritty C, Lewin S, Godfrey CM, Macdonald MT, Langlois EV, Soares-Weiser K, Moriarty J, Clifford T, Tunçalp Ö, Straus SE. PRISMA Extension for Scoping Reviews (PRISMA-ScR): Checklist and Explanation. *Ann Intern Med*. 2018 Oct 2;169(7):467-473. doi: 10.7326/M18-0850. Epub 2018 Sep 4. PMID: 30178033.