

INPLASY PROTOCOL

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Conflicts of interest:

None declared.

Relative efficacy of microneedling in the treatment of pattern hair loss: a protocol for a systematic review with network meta-analysis

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Review question / Objective: The objective of the proposed study is to determine the relative efficacy of microneedling and combination of it and other agents for androgenetic alopecia (AGA)—a condition that is also referred to as pattern hair loss.

Rationale: Pattern hair loss is one of the most common forms of hair loss in men and women; the condition is associated with decreased quality of life. Oral finasteride and topical minoxidil are treatments currently approved, by the United States Food and Drug Administration, for AGA. However, finasteride has been associated with significant side effects in men, and is not appropriate for women of childbearing potential. Furthermore, topical minoxidil requires daily prolonged use which is time-consuming for patients and requires high compliance to maintain efficacy. Due to these drawbacks, new treatments, such as microneedling, have been investigated. Microneedling involves the creation of small wounds on the scalp that prompt growth factor release and neovascularization—which, in turn, may promote hair growth. Microneedling has been used as a monotherapy—or in combination with other standard therapies—for the treatment of AGA. Further investigation through meta-analysis is salient as this quantitative technique can estimate the relative success of mono- and poly-therapy with microneedling; therefore, findings from a systematic review and meta-analysis on the comparative effectiveness can enable clinicians, patients, and researchers to make more informed decisions.

INPLASY registration number: This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 08 September 2022 and was last updated on 08 September 2022 (registration number INPLASY202290042).

INTRODUCTION

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Condition being studied: Androgenetic alopecia—which is also referred to as male and female pattern hair loss.

METHODS

Search strategy: A systematic search will be conducted on PubMed. Search phrases will include: "microneedling" AND "hair loss" "microneedling" AND "androgenetic alopecia".

Participant or population: The population of interest is men and women, of any age and ethnicity/race, diagnosed with pattern hair loss.

Intervention: Microneedling, as a monotherapy or in combination with other treatments, for androgenetic alopecia.

Comparator: Compared alternatives may include placebo/sham or active comparator (microneedling plus other therapies).

Study designs to be included: Data for the proposed study will be gathered from clinical trials.

Eligibility criteria: Clinical trials that investigate the use of microneedling for male and female pattern hair loss; evidence in non-English languages will be excluded.

Information sources: A systematic literature search will be conducted in PubMed.

Main outcome(s): Change in total hair density (in hairs/cm²) half a year after baseline.

Additional outcome(s): None.

Data management: Data will be analyzed using statistical packages in RStudio software; we plan to use the 'gemtc' and 'multinma' packages.

Quality assessment / Risk of bias analysis: The quality of evidence across our network will be assessed using the Confidence in Network Meta-Analysis (CINeMA) software—which is based on the grading of recommendations, assessment, development, and evaluations (GRADE) framework.

Strategy of data synthesis: Data will be pooled from clinical trials and, if data is sufficient, we plan to conduct a multivariable network meta-regression, a form of network meta-analysis where comparative efficacy of three or more interventions is quantitatively determined whilst accounting for confounding.

Subgroup analysis: None.

Sensitivity analysis: None.

Language restriction: Only publications in the English language will be included.

Country(ies) involved: Canada.

Keywords: Androgenetic alopecia; microneedling; network meta-analysis; meta-regression.

Dissemination plans: Publication of results in a peer-reviewed journal.

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