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The Efficacy and Safety of Micro-needling Combined with Tacrolimus versus Tacrolimus Monotherapy for Vitiligo Treatment: A Systematic Review and Meta-analysis

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ABSTRACT

Background: Vitiligo is a common disfiguring autoimmune disease that negatively impacts patients' quality of life. Tacrolimus is a topical immunomodulator medication that has been used successfully in treating vitiligo; however, based on recent studies, combination of topical tacrolimus with micro-needling suggests improved technique for drug delivery through stratum corneum.

Objectives: The aim of this systematic review was to assess the efficacy and safety of micro-needling combined with Tacrolimus versus Tacrolimus monotherapy in treating vitiligo.

Materials & Methods: We searched Medline, Embase, and CENTRAL. We included randomized controlled trials (RCTs) that compared micro-needling combined with Tacrolimus versus Tacrolimus monotherapy for treating individuals diagnosed with vitiligo. We sought to evaluate the following outcomes: the 5-grade re-pigmentation scale or Physician's Global Assessment (PGA), histopathological assessment, and adverse events. The risk ratio (RR) was used to represent dichotomous outcomes whereas Odds ratio (OR) used for adverse events, and the data were pooled using the inverse variance weighting method.



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Results: A total of 5 RCTs that enrolled 158 participants were deemed eligible. Administration of micro-needling combined with tacrolimus were significantly more efficacious than tacrolimus monotherapy in achieving improved re-pigmentation on PGA with a rate 75-100% (RR= 1.97, 95% CI: 1.35 to 2.86). Similarly, micro-needling combined with Tacrolimus has significantly increased the positive melanoblasts in histopathological assessment (RR= 2.11, 95% CI: 1.31 to 3.39). Regarding adverse events, micro-needling combined with Tacrolimus did not exhibit any significant difference than tacrolimus monotherapy (OR= 1.72, 95% CI: 0.10 to 29.36).

Conclusions: This meta-analysis demonstrated that even though micro-needling combined with Tacrolimus is an innovative approach, it could be a promising modality as it showed a clinically and statistically substantial improvement in re-pigmentation of vitiligo sites with acceptable tolerability and safety profile.

BIOGRAPHY

Ms. Hadeel a sixth-year of the MBBS program with an excellent academic GPA (+4.95/5.00). She was honored to be ranked the 1st in the batch in 2019. Hadeel is interested in dermatology, research, and leadership. She has published several papers and working on others to be accepted in a high standard journal. Hadeel participated in national and international conferences and won 1st place in health professionals conference in 2022. She is the leader of Mishkat Club at KSAU-HS, a club focuses on research and technology, as well she created a research community with more than 200 participants.



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- 1- Aljefri, Y. E., Alahmadi, R. A., Alajmi, R. S., Alkhamisi, T. A., Maaddawi, H. A., Alraddadi, A. A., & Alamri, A. M. (2021). Cutaneous Manifestations and Hormonal Changes Among Polycystic Ovary Syndrome Patients at a Tertiary Care Center. *Cureus*, 13(12), e20593. <https://doi.org/10.7759/cureus.20593>
- 2- Alsolamy, R. M., Almaddah, T., Aljabri, A., Maaddawi, H. A., Alzahrani, F., & Gashlan, M. (2023). Knowledge and Attitude of Saudi Physicians Toward Cannabidiol for Pediatric Epilepsy: A Cross-Sectional Study. *Cureus*. <https://doi.org/10.7759/cureus.36622>
- 3- Al Qurashi, A. A., Shah Mardan, Q. N. M., Mortada, H., Maddawi, H., Hakami, A. Y., & Mrad, M. A. (2021). Factors Influencing the Choice of Plastic Surgery as a Specialty in Saudi Arabia. *Plastic and reconstructive surgery. Global open*, 9(8), e3731. <https://doi.org/10.1097/GOX.00000000000003731>

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