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AARS News

AARS BoD Member Emmy Graber invites you to earn free CME! AARS Members are invited to attend a free CME virtual meeting on acne and rosacea. This will be held on Tuesday, October 18, 2022. For further details and to register online and view more information, proceed to this website today: <https://www.armmeeting.com/>.

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New Medical Research

Adverse-event reports in over-the-counter topical acne drug products containing benzoyl peroxide from a specific pharmaceutical company in the USA.

Szymanski L, Arekapudi KL. *Dermatol Ther (Heidelb)*. 2022 Sep 24. doi: 10.1007/s13555-022-00808-9. Online ahead of print. <https://pubmed.ncbi.nlm.nih.gov/36152215/>

Benzoyl peroxide (BPO) has been used extensively in dermatology, often for the treatment of acne vulgaris. In a 20-year period, dermatologists in the United States used over-the-counter BPO more than 13 million times. However, skin irritation and other adverse events (AEs) are associated with the use of BPO. AEs associated with BPO were identified using the Galderma pharmacovigilance system, which collects AE reports from multiple sources. Over approximately 20 years, 558 AE reports were collected from the database, ranging from application site reactions to systemic hypersensitivity reactions, resulting in a reporting rate of under 1%. These data show that the risk of OTC topical acne drug products containing BPO is low.

Antibacterial and anti-inflammatory activities of thymus vulgaris essential oil nanoemulsion on acne vulgaris.

Abdelhamed FM, Abdeltawab NF, ElRakaiby MT, et al. *Microorganisms*. 2022 Sep 19;10(9):1874. doi: 10.3390/microorganisms10091874. <https://pubmed.ncbi.nlm.nih.gov/36144477/>

Antibiotics are frequently used in acne treatment and their prolonged use has led to an emergence of resistance. This study aimed to investigate the use of natural antimicrobials as an alternative therapy. The antimicrobial and anti-inflammatory activities of five commonly used essential oils (EOs) (tea tree, clove, thyme, mentha and basil EOs), and their possible mechanisms of action against *Cutibacterium acnes* and *Staphylococcus epidermidis*, were explored. The effect of the most potent EO on membrane permeability was elucidated and its anti-inflammatory action, when formulated as nanoemulsion, was tested in an in vivo acne model. The in vitro studies showed that thyme EO had the most potent antimicrobial and antibiofilm activity, with phenolics and terpenoids as main antimicrobial constituents of EO. Thyme EO affected cell membrane permeability of both bacterial species, evident by the detection of the leakage of intracellular ions and membrane integrity by the leakage of nucleic acids. Morphological alteration in bacterial cells was confirmed by transmission electron microscopy. Thyme EO nanoemulsion led to the suppression of an inflammatory response in acne animal models along with a bacterial load decrease and positive histopathological changes. Collectively, thyme EO nanoemulsion showed potent antimicrobial and anti-inflammatory effects compared to the reference antibiotics, suggesting its effectiveness as a natural alternative in acne treatment.

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Influence of selected food product groups consumption frequency on acne-related quality of life in a national sample of polish female adolescents.

Rudzińska J, Głąbska D. *Int J Environ Res Public Health*. 2022 Sep 16;19(18):11670. doi: 10.3390/ijerph191811670. <https://pubmed.ncbi.nlm.nih.gov/36141942/>

Acne vulgaris affects over 80% of adolescents, mainly female ones, and may reduce their general quality of life, so its prevention and treatment are becoming necessary, while among the options for acne management, the potential influence of diet is indicated. The aim of the study was to assess the influence of selected food product groups consumption frequency on acne-related quality of life in a national sample of Polish female adolescents. The studied population of 1370 Polish female adolescents was gathered using random quota sampling of secondary schools representative of the whole country. The acne-related quality of life was assessed using the Acne Quality of Life (AQoL) Scale with the calculated Social Quality of Life (SOCQOL) Score, as well as the Acne Disability Questionnaire (ADQ) with the calculated Cardiff Acne Disability Index (CADi). The acne-related food product groups' consumption frequency was assessed using the Acne-specific Food Frequency Questionnaire (Acne-FFQ). There were no differences in food product consumption between subgroups stratified by the acne-related quality of life ($p > 0.05$),

and there was no correlation between food product consumption and the results of the SOCQOL Score ($p > 0.05$). For the CADL, positive correlations were indicated for fast foods ($p = 0.0450$; $R = 0.0688$), salty snacks ($p = 0.0342$; $R = 0.0727$), and chocolate confectionary ($p = 0.0147$; $R = 0.0837$), while a negative correlation was indicated for dairy beverages other than milk ($p = 0.0414$; $R = -0.0701$). In the studied group of Polish female adolescents, fast foods, salty snacks, and chocolate confectionary were indicated as potential acne-promoting factors, while dairy beverages other than milk were indicated as a potential acne-protective factor.

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Novel technique for rosacea treatment using optimal pulse technology: In vivo and clinical studies. Yuan J, Gao Y, Pi L, et al. *J Cosmet Dermatol.* 2022 Sep 13. doi: 10.1111/jocd.15384. Online ahead of print. <https://pubmed.ncbi.nlm.nih.gov/36099436/>

Background: Rosacea is a chronic inflammatory skin disease affecting the face, and the current treatment effect is not satisfactory. Based on the photomodulation of optimal pulse technology (OPT), we developed a novel treatment mode, namely, advanced OPT with low energy, three pulses, and long pulse width (AOPT-LTL). Aims: We aimed to explore the feasibility and underlying molecular mechanisms of AOPT-LTL treatment in a rosacea-like mouse model. Furthermore, we evaluated the safety and efficacy in patients with erythematotelangiectatic rosacea (ETR). Materials and methods: Morphological, histological, and immunohistochemical analyses were used to investigate the efficacy and mechanisms of AOPT-LTL treatment in the LL-37-induced rosacea-like mouse model. Moreover, 23 patients with ETR were included and received different times of treatment at intervals of 2 weeks depending on the severity of their condition. The treatment effect was assessed by comparing clinical photographs at baseline, 1 week, and 3 months after treatment, combined with the red value, GFSS, and CEA scores. Results: After the AOPT-LTL treatment of the mice, we observed that the rosacea-like phenotype, inflammatory cell infiltration, and vascular abnormalities were significantly ameliorated, and the expression of the core molecules of rosacea was significantly inhibited. In the clinical study, the AOPT-LTL treatment exerted satisfactory therapeutic effects on erythema and flushing of ETR patients. No serious adverse events were observed. Conclusions: AOPT-LTL is a safe and effective method for the treatment of ETR.

Quantitative evaluation of the effectiveness of chemical peelings in reducing acne lesions based on Gray-Level Co-Occurrence Matrix (GLCM). Odrzywołek W, Deda A, Zdrada J, et al. *Clin Cosmet Investig Dermatol.* 2022 Sep 12;15:1873-1882. doi: 10.2147/CCID.S375131. eCollection 2022. <https://pubmed.ncbi.nlm.nih.gov/36117771/>

Purpose: Acne vulgaris is a chronic, inflammatory disease accompanied by lesions affecting the structure of the skin. Chemical peels are one of the methods of reducing acne vulgaris. There is still a lack of quantitative methods of assessing impact of cosmetic procedure on the skin. Skin condition depends on skin texture characterization; therefore, the analysis that provides data about the textures can be helpful in assessing the effectiveness of cosmetic treatments. Patients and methods: The study involved 24 volunteers with acne lesions. Each participant underwent 4 treatments using chemical peels at two-week intervals. Before, during and after procedure clinical photography were made. To assess effectiveness of chemical peeling in acne lesion reduction, we were used gray-level co-occurrence matrix (GLCM) analysis. Qualitative assessment of acne severity was made by 12 experts in dermatology. Results: After a series of treatments, the GLCM contrast value decreased in each area of the face, and the GLCM homogeneity value increased, which means that the number of acne lesions was reduced. Expert assessment according to the IGA scale confirms the effectiveness of therapy with both salicylic and glycolic acid and pyruvic acid. Conclusion: The results of this study prove that GLCM analysis is a useful tool for assessing the effectiveness of chemical peel treatments. It can also be used for quantitative assessment of skin texture.

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High-frequency devices effect in vitro: promising approach in the treatment of acne vulgaris? Frommherz L, Reinholz M, Gürtler A, et al. *An Bras Dermatol.* 2022 Sep 12;S0365-0596(22)00194-5. doi: 10.1016/j.abd.2021.09.015. Online ahead of print. <https://pubmed.ncbi.nlm.nih.gov/36109271/>

Background: Acne vulgaris is an inflammatory skin disorder leading to an impairment of quality of life and is therefore not only a cosmetic issue. Its pathogenesis is multifactorial - of particular importance is the colonization with the bacterium *Propionibacterium acnes*. A wide range of different treatment options exists including topical and systemic treatments depending on severity. High Frequency (HF) therapy, historically developed in the 19th century, claims antimicrobial effects on acne skin, but solid data on its efficacy and mechanism of action is lacking. Objectives: The main objective of this study was to determine the efficacy of HF therapy on skin flora and *P. acnes* in vitro using a commercial device as well as to review studies on the mechanism of action. Methods: The plasma source was investigated regarding electrical settings, heat, and ozone development. Bacterial skin flora, fungal isolates, and *P. acnes* were exposed to HF in vitro and compared to unexposed controls by evaluating the number of colonies on agar plates. To further analyze bacterial species from normal skin flora, 16S-sequencing was performed. Statistical analyses were carried out using row analysis and unpaired t-test. Results: HF treatment led to a significant reduction of almost every bacterial and fungal species investigated in this study. Moreover, the number of colonies forming units was significantly decreased in *P. acnes* after HF treatment compared to controls in vitro. Study limitations: The experiments were performed in vitro only. To assess clinical effects further in vivo experiments are necessary. Conclusions: The results collected in this study, although in vitro, provide a mechanistic basis for HF as a complementary treatment option for patients with acne. It might also have a beneficial effect on patients with superficial infectious skin of the skin.

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Evaluating the effectiveness of stromal-vascular fraction (SVF) cells along with subcision method in the treatment of acne scars: A double-blind randomized controlled clinical trial study. Roohaninasab M, Seifadini A, Atefi N, et al. *J Cosmet Dermatol.* 2022 Sep 10. doi: 10.1111/jocd.15375. Online ahead of print. <https://pubmed.ncbi.nlm.nih.gov/36086927/>

Background: Subcision method is one of the main techniques for treatment of acne scars or stromal-vascular fraction (SVF) and combined therapy can improve treatment strategy. Objective: To use subcision method along with SVF for treatment of acne scar and comprised with alone subcision method. Materials and methods: In this double-blind clinical trial study, 10 patients with acne scars were entered into the study. Subcision technique was randomly performed on one side of the face and subcision technique plus SVF on opposite side of the face. All patients were examined before treatment and after 3 months by Visioface for volume, area, and depth of scars, as well as thickness and density of the epidermis and dermis of the scars in question. In addition, doctor's and patients' satisfaction, tolerability, and safety were determined after 3 months of treatment. Finally, statistical analysis was done by SPSS, version 25. Results: In terms of volume and area of scars, the mean percent change was 46.55 ± 13.92 and 44.60 ± 5.76 , for the case group, and 13.31 ± 9.27 and 11.28 ± 9.64 for the control group, respectively. So, combined therapy led to significant recovery compared with alone subcision method (p value < 0.001). In both interventions, the increase of density and thickness was proven after treatment, also a significant difference in complete, epidermal, and dermal thickness and epidermal density variables was observed between combined therapy and alone subcision (p value < 0.05). Mean score of doctor's and patients' satisfaction in combined therapy (7.10 ± 0.74 and 7.10 ± 0.99 , respectively), was also significantly higher than subcision alone (5.50 ± 0.53 and 5.30 ± 1.25 , respectively). Finally, no complications were observed in the patients. Conclusion: According to the acquired results, combined therapy can be considered as effective and safe treatment for acne scars with significant higher efficacy compared with subcision alone.

Evaluation of serum TWEAK, TRAIL, and oxidative stress markers in rosacea patients. Durmaz I, Turkmen D, Altunisik N, et al. *J Cosmet Dermatol.* 2022 Sep 9. doi: 10.1111/jocd.15365. Online ahead of print. <https://pubmed.ncbi.nlm.nih.gov/36083238/>

Background: Rosacea is a chronic inflammatory skin disease of unknown pathogenesis. TWEAK and TRAIL are two cytokines thought to have a role in the pathogenesis of some inflammatory and autoimmune diseases. Aims: The purpose of this study was to examine TWEAK and TRAIL serum levels and oxidative stress markers in patients with rosacea. Material and method: Forty rosacea patients and 40 sex- and age-matched healthy controls were involved in the study. Serum TWEAK and TRAIL levels were evaluated with ELISA kits. Serum total antioxidant status, total oxidant status, total thiol, native thiol, disulfide levels were evaluated, and oxidative stress index was computed. Results: Serum levels of TWEAK, TRAIL, and oxidative stress markers did not differ statistically in the patients and controls. Both TWEAK and TRAIL levels in the patients were detected to be statistically higher in male than in female. Conclusion: TWEAK and TRAIL may not have a systemic effect in rosacea, unlike other inflammatory diseases. More studies are needed to investigate the role of TWEAK and TRAIL in rosacea.

Acne and its post-inflammatory hyperpigmentation treatment by anti-acne dissolving microneedle patches. Tai M, Zhang C, Ma Y, et al. *J Cosmet Dermatol.* 2022 Sep 5. doi: 10.1111/jocd.15352. Online ahead of print. <https://pubmed.ncbi.nlm.nih.gov/36059276/>

Objective: Acne is a significant problem in young people. At present, most acne treatment products are topically applied cosmetics, whose efficacy is limited by the stratum corneum. The dissolving microneedle technique can effectively deliver drug molecules into the body. In this study, dissolving microneedles containing anti-acne ingredients were tested for human efficacy and safety. Methods: We conducted a 28-day clinical efficacy and safety trial on 30 individuals with visible facial acne. During the trial, anti-acne microneedle (AA-DMN) patches were applied to designated skin areas once daily for 28 consecutive days. Skin pigmentation was measured using a Courage + Khazaka skin melanin and hemoglobin test probe Mexameter MX18. Acne volume was measured using a Canfieldsci skin rapid optical imaging system PRIMOS. In addition, skin irritation was evaluated via self-report and dermatologist's examination. Results: The AA-DMN patches showed good efficacy including improvement of skin pigmentation and reduced acne volume. Acne volume was reduced by 12.34% after 3 days of patch use and further reduced by 10.01% after 7 continuous days of use. After 28 days of treatment, skin melanin decreased by 5.88% and heme decreased by 7.83%. No adverse reactions were observed in any of the participants. Conclusions: AA-DMN patches showed an excellent effect in reducing acne and post-inflammatory hyperpigmentation (PIH), without adverse skin reactions. The novel AA-DMN patch is a safe and effective anti-acne treatment.

Meta-analysis of fractional radiofrequency treatment for acne and/or acne scars. Li J, Fangfang D, Jie K. *J Cosmet Dermatol.* 2022 Sep 5. doi: 10.1111/jocd.15348. Online ahead of print. <https://pubmed.ncbi.nlm.nih.gov/36062400/>

Background: Fractional radiofrequency (FRF) is increasingly used for acne scars. The common coexistence of acne scars and active acne is a challenge in the timely management of acne scarring. Aims: we conducted a systematic review and meta-analysis to compare the efficacy and safety of FRF treatment with the lasers for acne and/or acne scars. Methods: A systematic search was performed on PubMed, Embase, Ovid, Cochrane Library, and Web of Science. Compared with the lasers, a meta-analysis was conducted to assess the clinical improvement and adverse events after FRF treatment. Results: Eight randomized controlled trials were included. FRF group was more effective than the laser group in patient-evaluated acne improvement (RR=1.35, 95%CI: 1.01~1.80). Regardless of observer assessment or patient evaluation, the FRF group was as effective as the laser group in treating atrophic acne scars (RR = 0.92, 95%CI: 0.78~1.08; RR =1.15, 95%CI: 0.99~1.34). Although there was no difference in pain level and

crusting time between the two groups (SMD =0.20, 95%CI: -0.72~1.12; SMD =-0.93, 95%CI: -2.38~0.52), PIH incidence of FRF was significantly lower than that of the laser group (RR = 0.12, 95%CI: 0.04~0.35). The duration of erythema after FRF treatment was also obviously shorter than that after the laser treatment (SMD =-0.78, 95%CI: -1.37~-0.18). Subgroup analysis showed that at least a 12-week follow-up was required to observe the full effects of FRF. Conclusions: FRF could be a better choice for atrophic acne scar patients with active acne. FRF is superior in treating atrophic acne scar patients prone to pigmentation.

Skin barrier deficiency in rosacea: an algorithm integrating otc skincare products into treatment regimens.

Baldwin H, Alexis A, Andriessen A, et al. J Drugs Dermatol. 2022 Sep 1;21(9):SF3595563-SF35955610. doi: 10.36849/JDD.m0922. <https://pubmed.ncbi.nlm.nih.gov/36074516/>

Introduction: Rosacea is a chronic condition involving inflammation leading to a diminished skin barrier function in sebaceous gland-rich facial skin. The current algorithm represents part II of a series investigating similar topics associated with preventing, treating, and maintaining rosacea, including ceramides-containing skincare. Methods: The consensus process consisted of a modified Delphi technique. A previously published review by the US Cutaneous Rosacea Outcomes (USCRO) group on skin barrier deficiency in rosacea and the integration of over-the-counter (OTC) products and skincare recommended for rosacea treatment and maintenance informed the development of the current algorithm. The selected information from the literature searches, coupled with the USCRO group's opinion and experience, was used to develop, discuss, and reach a consensus on an evidence-based clinical treatment and maintenance algorithm focusing on rosacea phenotypes. Results: The algorithm includes foundational measures to be taken by all patients with rosacea and rosacea-prone skin. These measures include education, behavioral modifications, avoidance of triggers and skin irritants, preventative skincare, and sun avoidance and sunscreen use. The algorithm further describes how assessment of skin condition and grading of cutaneous rosacea should take place during treatment and maintenance while the preventative measures continue. Conclusions: Prescription medications combined with gentle cleansers, moisturizers, and sunscreen support a successful rosacea therapy.

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The role of epidermal barrier dysfunction and cutaneous microbiome dysbiosis in the pathogenesis and management of acne vulgaris and rosacea.

Marson J, Bhatia N, Graber E, et al. J Drugs Dermatol. 2022 Sep 1;21(9):SF3502915-SF35029114. doi: 10.36849/JDD.m0922. <https://pubmed.ncbi.nlm.nih.gov/36074515/>

Background: Dysregulation of either the cutaneous microbiome (CM) or epidermal barrier function (EBF) is thought to play an increasingly important role in acne vulgaris (AV) and rosacea pathogenesis. Objective: To review the literature regarding epidermal barrier dysfunction (EBD) and cutaneous dysbiosis in AV and rosacea and provide clinical pearls for dermatologists. Methods: A Medline literature search was performed for relevant literature regarding EBD and dysbiosis and either AV or rosacea. An expert consensus panel was then convened to discuss article merits and distill findings into clinical pearls. Results: Final review included 138 articles. Puberty may alter natural stratum corneum lipid ratios, instigating and/or exacerbating EBD in AV. Patients with severe AV have an abundance of virulent *Cutibacterium acnes* phylotype IA1. EBD may manifest as classic signs of rosacea and improve with treatment. While several microbial populations are dysregulated in rosacea, the effect from any singular species is unclear. Current AV and rosacea treatment regimens may mitigate inflammation but may also indiscriminately damage CM and EBF. Physiologic moisturizers and cleansers that harness pre-/pro-/postbiotics may have a role in restoring CM, EBF, and potentially improving dermatosis severity. Limitations: Limited prospective clinical trial data especially regarding over-the-counter (OTC)/non-prescription skincare products. Conclusion: Appropriately developed prescription and OTC preparations may selectively influence the microbiome and potentially maintain/restore EBF.

By understanding this relationship, dermatologists will be better able to educate patients on the importance of appropriate skin care.

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Reasons why adults do not seek treatment for acne: A survey of university students and staff. Baird E, Click I, Kotsonis R, Bibb L. *J Dermatolog Treat.* 2022 Aug 29;1-3. doi: 10.1080/09546634.2022.2116925. Online ahead of print. <https://pubmed.ncbi.nlm.nih.gov/36000959/>

Background: Acne can be a highly debilitating disease. There is a high prevalence in adults, yet treatment rates in this population are low. Objectives: An online survey was created to determine the main reasons why adults with acne do not seek treatment. Methods: University students and staff 20 years of age and older were emailed a link to an online survey that asked them if they have facial acne, if they see a provider for it, and how they self-treat their acne. Results: 1,136 complete surveys were returned. Top reasons for not seeing a provider include not being bothered enough to seek treatment (n = 418, 53.7%), believing that their acne will eventually resolve on its own (n = 351, 45.1%), concerned about costs of treatment (n = 274, 35.2%), and currently satisfied with over-the-counter (OTC) treatment (n = 261, 33.5%). Conclusion: Most adults with acne do not see providers because they are not bothered enough by it or are satisfied with OTC treatments. However, of the population that has acne and does not seek treatment, a significant portion (n = 234, 30.1%) indicated it was for a reason that could be classified as a treatment barrier.

Clinical efficacy and safety of pulsed dye laser combined with pingyangmycin on hyperplastic scar after acne.

Guo R, Xuan W, He X, Xu K. *Mediators Inflamm.* 2022 Aug 28;2022:3305107. doi: 10.1155/2022/3305107. eCollection 2022. <https://pubmed.ncbi.nlm.nih.gov/36072572/>

Background: Acne is the most common chronic inflammatory disease of hair follicles and sebaceous glands in dermatology. Hyperplastic scar (HS), a very common sequelae of acne, is also the most common scar type in clinical practice. Objective: This research analyzed the clinical effectiveness and safety of pulsed dye laser (PDL) combined with pingyangmycin (PI) in the treatment of post-acne HS. Methods: One hundred and nine patients with post-acne HS admitted in June 2020 were selected and divided into a research group (n = 52) and a control group (n = 57) according to the difference in treatment methods. The efficacy, incidence of adverse reactions, skin repair, treatment comfort, and satisfaction were compared between groups. Results: The total effective rate was higher in the research group compared with the control group. No statistical difference was observed between groups in the incidence of adverse reactions. The research group showed better scar repair, skin improvement, and granulation tissue maturity than the control group. And compared with the control group, the growth factor of the research group was lower, while the treatment comfort and satisfaction, psychological state, and prognosis quality of life were higher. The two groups showed no notable difference in the recurrence rate. Conclusions: PDL combined with PI can effectively improve the clinical efficacy, scar repair effect, overall skin status, and treatment experience of patients and boost the psychological state and prognostic quality of life of patients, which has great clinical application prospect for the treatment of HS.

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Hidradenitis suppurativa: A perspective on genetic factors involved in the disease. Moltrasio C, Tricarico PM,

Romagnuolo M, et al. *Biomedicines.* 2022 Aug 21;10(8):2039. doi: 10.3390/biomedicines10082039. <https://pubmed.ncbi.nlm.nih.gov/36009585/>

Hidradenitis Suppurativa (HS) is a chronic inflammatory skin disease of the pilosebaceous unit, clinically consisting of painful nodules, abscesses, and sinus tracts mostly in, but not limited to, intertriginous skin areas. HS can be

defined as a complex skin disease with multifactorial etiologies, including-among others-genetic, immunologic, epigenetic, and environmental factors. Based on genetic heterogeneity and complexity, three different forms can be recognized and considered separately as sporadic, familial, and syndromic. To date, several genetic variants associated to disease susceptibility, disease-onset, and/or treatment response have been reported; some of these reside in genes encoding the gamma-secretase subunits whereas others involve autoinflammatory and/or keratinization genes. The aim of this perspective work is to provide an overview of the contribution of several genetic studies encompassing family linkage analyses, target candidate gene studies, and -omic studies in this field. In our viewpoint, we discuss the role of genetics in Hidradenitis suppurativa considering findings based on Sanger sequencing as well as the more recent Next Generation Sequencing (i.e., exome sequencing or RNA Sequencing) with the aim of better understanding the etio-pathogenesis of the disease as well as identifying novel therapeutic strategies.

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Association between frontal fibrosing alopecia and rosacea: Results from clinical observational studies and gene expression profiles. Liu L, Chen Y, Chen J, et al. Front Immunol. 2022 Aug 24;13:985081. doi: 10.3389/fimmu.2022.985081. eCollection 2022. <https://pubmed.ncbi.nlm.nih.gov/36091020/>

Background: In recent years, frontal fibrosing alopecia (FFA), a type of scarring alopecia, has attracted increasing attention. Several studies have reported the frequent occurrence of rosacea in FFA; however, the association between FFA and rosacea and the underlying pathogenesis have not been thoroughly clarified. Thus, this study aimed to quantify these relationships and investigate their shared molecular mechanisms. Methods: We evaluated the association between FFA and rosacea by analyzing clinical data from nine observational studies. We then analyzed the gene expression profiles of FFA and rosacea. First, differential expression analysis and weighted gene co-expression network analysis were used to identify the common differentially expressed genes (DEGs). Later, we conducted a functional enrichment analysis and protein-protein interaction network and used seven algorithms to identify hub genes. Then, we performed a correlation analysis between the hub genes and the gene set variation analysis scores of common pathways in the gene set enrichment analysis (GSEA). The results were validated using different datasets. Finally, transcription factors were predicted and verified, and CIBERSORT and single-sample GSEA were used to estimate the infiltrating immune cells. Results: Patients with FFA had significantly higher odds for rosacea (pooled odds ratio [OR], 2.46; 95% confidence interval [CI], 1.78-3.40), and the pooled prevalence of rosacea in patients with FFA was 23% (95% CI, 14-23%). Furthermore, we identified 115 co-DEGs and 13 hub genes (CCR5, CCL19, CD2, CD38, CD83, CXCL8, CXCL9, CXCL10, CXCL11, CXCR4, IRF1, IRF8, and PTPRC). Seven pathways showed a high correlation with these hub genes. In addition, one TF, STAT1, was highly expressed in both diseases, and the results of the immune infiltration analysis indicated the importance of M1 macrophages and effector memory CD8+ T cells. Conclusion: This study contributes to the understanding of the relationship between FFA and rosacea, and based on the hub genes, we reveal the potential pathologies shared by the two diseases. This finding provides new insights of underlying molecular mechanisms, and it may inspire future research on this comorbidity.

Background: In recent years, frontal fibrosing alopecia (FFA), a type of scarring alopecia, has attracted increasing attention. Several studies have reported the frequent occurrence of rosacea in FFA; however, the association between FFA and rosacea and the underlying pathogenesis have not been thoroughly clarified. Thus, this study aimed to quantify these relationships and investigate their shared molecular mechanisms. Methods: We evaluated the association between FFA and rosacea by analyzing clinical data from nine observational studies. We then analyzed the gene expression profiles of FFA and rosacea. First, differential expression analysis and weighted gene co-expression network analysis were used to identify the common differentially expressed genes (DEGs). Later, we conducted a functional enrichment analysis and protein-protein interaction network and used seven algorithms to identify hub genes. Then, we performed a correlation analysis between the hub genes and the gene set variation analysis scores of common pathways in the gene set enrichment analysis (GSEA). The results were validated using different datasets. Finally, transcription factors were predicted and verified, and CIBERSORT and single-sample GSEA were used to estimate the infiltrating immune cells. Results: Patients with FFA had significantly higher odds for rosacea (pooled odds ratio [OR], 2.46; 95% confidence interval [CI], 1.78-3.40), and the pooled prevalence of rosacea in patients with FFA was 23% (95% CI, 14-23%). Furthermore, we identified 115 co-DEGs and 13 hub genes (CCR5, CCL19, CD2, CD38, CD83, CXCL8, CXCL9, CXCL10, CXCL11, CXCR4, IRF1, IRF8, and PTPRC). Seven pathways showed a high correlation with these hub genes. In addition, one TF, STAT1, was highly expressed in both diseases, and the results of the immune infiltration analysis indicated the importance of M1 macrophages and effector memory CD8+ T cells. Conclusion: This study contributes to the understanding of the relationship between FFA and rosacea, and based on the hub genes, we reveal the potential pathologies shared by the two diseases. This finding provides new insights of underlying molecular mechanisms, and it may inspire future research on this comorbidity.

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A novel multi-layer perceptron model for assessing the diagnostic value of non-invasive imaging instruments for rosacea. Huang Y, He J, Zhang S, et al. PeerJ. 2022 Aug 17;10:e13917. doi: 10.7717/peerj.13917. eCollection 2022. <https://pubmed.ncbi.nlm.nih.gov/35996670/>

Background: Reflectance confocal microscopy (RCM), VISIA, and dermoscopy have emerged as promising tools for objective diagnosis and assessment of rosacea. However, little is known about the diagnostic value of these imaging systems for rosacea. Objectives: To assess the diagnostic value of RCM, VISIA, and dermoscopy for rosacea by

establishing a novel multilayer perceptron (MLP) model. Methods: A total of 520 patients with rosacea and other facial diseases were included in this study. A total of 474 samples of dermoscopy data, 374 samples of RCM data, 434 samples of VISIA data, and 291 samples containing three data sources were collected. An MLP model was built with the total data to explore the association between the imageological features of each instrument and the probability of rosacea. Results: Our MLP model revealed that the area under the receiver operating characteristic curve (AUROC) values of RCM, VISIA and dermoscopy for diagnosing rosacea were 0.5233, 0.5646 and 0.7971, respectively. The integration of these three tools with clinical data could further improve the accuracy of the predictive diagnosis to 0.8385. For the imageological features of each tool, abnormalities (hyperkeratosis or parakeratosis) in the stratum corneum were effective variables for excluding rosacea (odds ratio [OR], 0.4333) under RCM. The indicators of rosacea under VISIA included overall severity of erythema, erythema involving the cheek or superciliary arch, visible red blood vessels, and papules (OR = 2.2745, 3.1592, 1.8365, 2.8647, and 1.4260, respectively). The candidate variables of dermoscopy included yellow background, white background, uniform distribution of vessels, branched vessels, and reticular blood vessels (OR = 0.4259, 0.4949, 2.2858, 3.7444, and 2.4576, respectively). Conclusions: RCM, dermoscopy, and VISIA each can present several imageological features and were of certain value for assisting rosacea diagnosis. The combined analysis of these three tools using our MLP model may be useful for improving the accuracy of diagnosing rosacea.

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Montelukast as an effective adjuvant in the treatment of moderate acne vulgaris. Fazelzadeh Haghghi N, Dastgheib L, Saki N, et al. *Dermatol Ther.* 2022 Aug 17;e15770. doi: 10.1111/dth.15770. Online ahead of print.

<https://pubmed.ncbi.nlm.nih.gov/36054253/>

Although antibiotics are among the most commonly used treatments of acne, there are refractory cases, or they can cause some complications. Recently, leukotriene B4 has been found to play a major role in inflammatory acne lesions. This double blind, randomized clinical trial was conducted on 108 patients with acne who needed systemic therapy and referred to dermatology clinics affiliated to Shiraz University of Medical Sciences. One group (53 patients) received 100 mg doxycycline daily plus placebo and the other group (55 patients) received 100 mg daily doxycycline plus 10 mg daily montelukast. Both groups also received topical benzoyl peroxide 5% every other night. The study period was 3 months and the patients were investigated by lesion count, investigator global assessment (IGA), global acne grading system (GAGS), and Cardiff acne disability index (CADI) scoring systems. Total lesion count, inflammatory lesion count, and non-inflammatory lesion count as well as IGA and GAGS decreased in both treatment groups. At the end of the study, however, the inflammatory lesion count and IGA score reduced more significantly in the montelukast group ($p = 0.018$ and 0.045 , respectively). In addition, the two groups were significantly different with regard to the percentage of decrease in the total lesion count, inflammatory lesions, and IGA ($p = 0.033$, 0.003 , and 0.044 , respectively). Thus, montelukast can be used as an adjuvant therapy besides other treatments of acne, especially for inflammatory lesions.

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A comparative study of dermatoscopic features of acne-related postinflammatory hyperpigmentation in facial and nonfacial areas in Asian patients. Jurairattanaporn N, Suchonwanit P, Rattananukrom T, Vachiramon V. *J Clin Aesthet Dermatol.* 2022 Aug;15(8):16-21. <https://pubmed.ncbi.nlm.nih.gov/36061483/>

Background: Postinflammatory hyperpigmentation (PIH) is a common problem, especially in patients with darker skin tones. It can occur on any area of the body following external injuries or intense inflammatory conditions. However, there is limited evidence regarding the differences in dermatoscopic patterns between facial acne-related PIH and nonfacial acne-related PIH. Objective: We sought to determine the dermatoscopic features of acne-related PIH in

facial and nonfacial areas in an Asian population. Methods: Patients with acne-related PIH in both facial and nonfacial areas were enrolled. Baseline demographic data, location, and duration of PIH were recorded. Dermatoscopic and clinical pictures of each patient were taken from the darkest PIH lesions of both areas. Differences in dermatoscopic patterns were analyzed. Results: Fifty patients were enrolled. The mean age was 26.74 (+ 6.75) years, and the Fitzpatrick Skin Types were III (66%) and IV (34%). In terms of morphological patterns of melanin, nonfacial PIH showed a significantly more regular pigment network than facial PIH (100% vs. 20%, $p < 0.05$), while facial PIH exhibited a more pseudoreticular pigment network than nonfacial PIH (70% vs. 0%, $p < 0.05$). In terms of vascularity, facial PIH demonstrated more telangiectasia and an increased vascular component compared to nonfacial PIH (56% vs. 16%, $p < 0.05$). Moreover, hypopigmentation within the PIH lesion was demonstrated in both facial and nonfacial lesions (42% vs. 50%, $p = 0.541$). Conclusion: Acne-related PIH in facial and nonfacial areas showed different morphological pigment patterns and degrees of vascularity. Dermatoscopic examination should be performed before treatment initiation.

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Genomic and phenotypic characterization of cutibacterium acnes bacteriophages isolated from acne patients. Kim S, Song H, Jin JS, et al. *Antibiotics* (Basel). 2022 Aug 2;11(8):1041. doi: 10.3390/antibiotics11081041.

<https://pubmed.ncbi.nlm.nih.gov/36009910/>

Cutibacterium acnes is a pathogen that can cause acne vulgaris, sarcoidosis, endodontic lesions, eye infections, prosthetic joint infections, and prostate cancer. Recently, bacteriophage (phage) therapy has been developed as an alternative to antibiotics. In this study, we attempted to isolate 15 phages specific to C. acnes from 64 clinical samples obtained from patients with acne vulgaris. Furthermore, we sequenced the genomes of these three phages. Bioinformatic analysis revealed that the capsid and tape measure proteins are strongly hydrophobic. To efficiently solubilize the phage particles, we measured the adsorption rate, one-step growth curve, and phage stability using an SMT2 buffer containing Tween 20. Here, we report the genotypic and phenotypic characteristics of the novel C. acnes-specific phages.

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The use of isotretinoin in acne therapy in early childhood and its effect on the occurrence of acne symptoms later in life. Eight-year follow-up. Brzezinski P, Wollina U, Smigielski J, Borowska K. *Postepy Dermatol Alergol*.

2022 Aug;39(4):682-687. doi: 10.5114/ada.2022.118921. Epub 2022 Sep 1.

<https://pubmed.ncbi.nlm.nih.gov/36090714/>

Introduction: Acne vulgaris is a chronic inflammatory skin disease of the pilosebaceous follicles that affects patients of all ages. Aim: Use of isotretinoin in the early stages of the disease to prevent subsequent lesions of acne, including prolonged treatment and acne scars at a later age. Material and methods: A retrospective, comparative study was carried between January 2010 and November 2018. The study population consisted of 90 children aged 9-18 years with acne. During treatment by isotretinoin the clinical evaluation was done every month. Patients were divided into three groups according to age. One of the qualification criteria was follow-up visits. Results: A total of 90 children (67.8% females; mean age: 13.5 years) were enrolled. In group A (30 individuals - aged 9-11) and B (30 individuals - aged 12-13), treatment was terminated 2 months after clinical improvement (mean: 3 months). In control group C (30 individuals - aged 14-18), treatment was carried out using average cumulative dose 135 mg/kg bw/day. All groups showed up for follow-up after 1 to 8 years. In groups A and B, 13 people underwent a second acne treatment; in 3.33% oral isotretinoin was used, in 18.33% topical treatment. In group C, 30 (100%) individuals underwent a second acne treatment; in 20% oral isotretinoin was used, and 80% required a topical treatment. Acne scars and post acne hyperpigmentation have been documented in 73.33% in group C. Conclusions: Early, reasonable and short-term use

of isotretinoin can reduce the incidence of acne in the future and reduce the occurrence of secondary acne symptoms.

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Antibiotic resistance risk with oral tetracycline treatment of acne vulgaris. Swallow MA, Fan R, Cohen JM, Bunick CG. *Antibiotics* (Basel). 2022 Jul 30;11(8):1032. doi: 10.3390/antibiotics11081032. <https://pubmed.ncbi.nlm.nih.gov/36009899/>

Almost 1 billion people worldwide have acne, and oral tetracyclines, including doxycycline and minocycline, are effective and frequently prescribed treatments for acne. However, there is growing concern for the development of antibiotic resistance with such widespread utilization by dermatologists. Additionally, tetracyclines are known to have various potential side effects, including gut dysbiosis, gastrointestinal upset, photosensitivity, dizziness, and vertigo. However, in 2018 a novel narrow-spectrum tetracycline, sarecycline, was Food and Drug Administration-approved to treat moderate-to-severe acne vulgaris in patients 9-years-old and above. Sarecycline was designed to target *Cutibacterium acnes*, the pathogenic bacterium in acne vulgaris, which may reduce the risk of resistance. This paper examines the growing concerns of antibiotic resistance due to oral tetracycline usage in the treatment of acne vulgaris, with a focus on the promising third-generation, narrow-spectrum tetracycline, sarecycline.

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Myths, misconceptions, and attitudinal trends among patients with acne. Ansari F, Khare AK, Gupta LK. *Indian J Dermatol Venereol Leprol.* 2022 Jul 25;1-6. doi: 10.25259/IJDVL_898_2021. Online ahead of print. <https://pubmed.ncbi.nlm.nih.gov/35962511/>

Background: Despite acne being a common dermatological problem, there is a paucity of literature addressing the knowledge, attitude and practice about it. Aims/Objectives: To find out what patients know about acne, its cause and treatment, as well as myths, misconceptions, and attitude towards it. Methods: A cross-sectional, descriptive questionnaire-based study on acne patients at Maharana Bhupal Hospital, RNT Medical College, Udaipur, Rajasthan, India. Results Most (84.8%) patients belonged to the age group of 16-25 years. The majority (63.9%) presented 12 months after the onset of acne. More than half had average knowledge, a positive attitude and good practices, related significantly to gender and education. Limitations: A standardized questionnaire suitable for all dialects and regional languages would have yielded more uniform results. Conclusion: Study revealed that acne patients still need to acquire accurate, adequate and easily accessible information to seek timely and appropriate treatment and alleviate their psychological suffering.

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Clinical Reviews

Demographic gaps and requirements for participation: A systematic review of clinical trial designs in hidradenitis suppurativa. James JF, Madray VM, Salame N, et al. *Dermatology.* 2022 Sep 15;1-7. doi: 10.1159/000526069. Online ahead of print. <https://pubmed.ncbi.nlm.nih.gov/36108592/>

Background: Hidradenitis suppurativa (HS) is a chronic inflammatory disease that disproportionately affects women, as well as Black and biracial individuals. While adalimumab remains the only therapy approved by the Food and Drug Administration for HS, many HS clinical trials for novel and re-tasked therapies are ongoing or upcoming. To optimize treatment equity, reflect the patient population, and facilitate trial participation, it is important to elucidate aspects of clinical trial protocols that may systematically exclude specific patient groups or impose hardships. Objective: The study aimed to systematically review inclusion and exclusion criteria as well as participant demographics in HS clinical trials. Methods: A literature search of PubMed, Embase, Cochrane Central, and Web of Science databases was

conducted. Peer-reviewed publications of randomized controlled trials that were written in English and had at least 10 participants were included. Title and abstract screening and data extraction were completed by two independent reviewers, with disagreements resolved by a third. Results: Twenty-three studies totaling 1,496 adult participants met the inclusion criteria. Race and ethnicity were not reported in 473/1,496 (31.6%) and 1,420/1,496 (94.9%) trial participants, respectively. Trial participants were predominantly white (811/1,023, 79.3%) and female (1,057/1,457, 72.5%). The median of each study's average age was 35.7 years (IQR 33.5-38.0), and 17/23 (73.9%) trials excluded pediatric patients. Nearly all participants had Hurley Stage II (499/958, 52.0%) or Hurley Stage III (385/958, 40.2%) disease. Many trials excluded patients who were pregnant (19/23, 82.6%) and breastfeeding (13/23, 56.5%), or who had HS that was "too severe" (8/23, 34.8%) or "too mild" (16/23, 70.0%). Frequently, trial protocols required prolonged washout periods from HS therapies, relatively long duration in the study's placebo arm, and prohibited concurrent analgesic use. Conclusions: This systematic review of 23 HS clinical trials totaling 1,496 participants identified substantial hardships imposed by trial participation, high rates of missing race and ethnicity data, and low representation of key patient groups, including those who identify as Black. Future trials with pragmatic study designs, broader inclusion criteria, and study sites in diverse communities may alleviate burdens of trial participation and improve enrollment of diverse patient groups.

Trifarotene 0.005% cream in the treatment of facial and truncal acne vulgaris in patients with skin of color: A case series. Del Rosso JQ, Lain E, York JP, Alexis A. *Dermatol Ther (Heidelb)*. 2022 Sep;12(9):2189-2200. doi: 10.1007/s13555-022-00788-w. Epub 2022 Aug 22. <https://pubmed.ncbi.nlm.nih.gov/35994159/>

The clinical appearance of acne vulgaris (AV) and the response to therapeutic agents may vary in people with skin of color (SoC) compared with those with lighter skin types. Given the heightened potential for postinflammatory hyperpigmentation and keloid development, effective and timely AV treatment in patients with SoC is especially important. However, these patients are frequently underrepresented in clinical trials, and SoC photographs are generally underrepresented in dermatology. Trifarotene 0.005% cream is a retinoid approved for the once-daily topical treatment of AV, and was studied in large-scale clinical trials that assessed the treatment of AV on both the face and trunk. For severe AV, a topical retinoid may be used in combination with an oral antibiotic, such as doxycycline. Five subjects covering Fitzpatrick skin phototypes III, IV, V, and VI were selected from two larger studies to visually demonstrate treatment of clinically diagnosed AV with trifarotene 0.005% cream. Two subjects received 24 weeks of treatment with trifarotene 0.005% cream for moderate AV on the face and trunk, while three subjects received 12 weeks of treatment with trifarotene 0.005% cream in association with 120 mg oral doxycycline with modified polymer coating for severe facial AV. This case series supports the favorable efficacy and safety of facial and truncal AV treatment with trifarotene 0.005% cream, with or without oral doxycycline, in subjects with SoC (phototypes III-VI).

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Racial and ethnic diversity of US participants in clinical trials for acne, atopic dermatitis, and psoriasis: A comprehensive review. Sevagamoorthy A, Sockler P, Akoh C, Takeshita J. *J Dermatolog Treat*. 2022 Aug 31;1-12. doi: 10.1080/09546634.2022.2114783. Online ahead of print. <https://pubmed.ncbi.nlm.nih.gov/35980324/>

An increasing body of literature describes underreporting of race and ethnicity, and overrepresentation of White individuals in clinical trials. We aimed to evaluate the racial and ethnic diversity of US participants in clinical trials for acne, atopic dermatitis (AD), and psoriasis. We performed a comprehensive review of clinical trials for these common dermatologic diseases that were published between January 2014 and July 2019. Race and ethnicity reporting among all trials, and the racial and ethnic distribution of US participants were compared by skin disease, intervention type, and trial phase. In total, 103 articles representing 119 unique trials were evaluated. Race and ethnicity were reported in only 22.7% of trials. The proportion of White participants (77.5%) was higher than that of the US population (72.5%,

$p < .01$); a finding largely driven by psoriasis trials (84.7% White). The proportions of non-White and Hispanic individuals in non-topical (21.0 and 16.3%, respectively) and Phase III (20.5 and 18.7%, respectively) trials were lower than those in topical (23.5 and 23.3%, respectively; $p < .01$) and Phase I/II trials (25.6 and 22.3%, respectively; $p < .01$). Race and ethnicity remain underreported in dermatologic clinical trials, and US trial participant diversity differs by skin disease, intervention type, and trial phase.

Management of acne in transgender and gender diverse youth. Part 1: Gender affirming care and risk factors for the development of acne. Boos MD, Hollingshead N, Hodax JK. *Pediatr Dermatol.* 2022 Aug 26. doi: 10.1111/pde.15113. Online ahead of print. <https://pubmed.ncbi.nlm.nih.gov/36017732/>

Acne vulgaris is among the most common skin disorders afflicting adolescents worldwide, and though well-established guidelines of care exist for acne management, these guidelines do not uniformly consider or address the unique psychosocial and medical needs of transgender and gender diverse (TGD) youth. TGD youth may possess distinct goals of therapy when treating their acne; the use of medicines routinely employed to treat acne may also expose TGD adolescents receiving gender affirming medical therapy to greater risk of adverse events. Part 1 of this two-part review provides dermatologists an understanding of gender affirming care and its timing, as well as its potential impacts on the development of acne in TGD youth.

Immunomodulatory drugs in the treatment of hidradenitis suppurativa-possibilities and limitations. Świerczewska Z, Lewandowski M, Surowiecka A, Barańska-Rybak W. *Int J Mol Sci.* 2022 Aug 26;23(17):9716. doi: 10.3390/ijms23179716. <https://pubmed.ncbi.nlm.nih.gov/36077114/>

Hidradenitis suppurativa, also known as acne inversa, is a chronic, progressive, debilitating, recurrent inflammatory skin disease characterized by the occurrence of very severe, persistent, painful nodules, abscesses, and fistulas, most commonly found in the skin folds of the axilla, groin, gluteal, and perianal areas. Treatment is rather difficult and typically requires the use of multiple modalities. Regardless of the presence of several therapeutic options, treatment often turns out to be ineffective or poorly selected concerning the clinical picture of the disease. Thus, the search for new biologics and other target treatments of hidradenitis suppurativa is ongoing. The safety and efficacy of adalimumab, still the only U.S. Food and Drug Administration approved biologic in the hidradenitis suppurativa treatment, paved the way for new drugs to be compared with it. Several more drugs with new immunological targets are currently under investigation for the treatment of acne inversa. The aim of the article was to present the current and future targets of acne inversa treatment, simultaneously providing insights into the molecular pathomechanisms of the disease.

Management of acne in transgender and gender diverse youth. Part 2: Unique considerations and strategies in medical treatment. Hollingshead N, Hodax JK, Boos MD. *Pediatr Dermatol.* 2022 Aug 16. doi: 10.1111/pde.15114. Online ahead of print. <https://pubmed.ncbi.nlm.nih.gov/35973559/>

Acne vulgaris is among the most common skin disorders afflicting adolescents worldwide, and though well-established guidelines of care exist for acne management, these guidelines do not uniformly consider or address the unique psychosocial and medical needs of transgender and gender diverse (TGD) youth. Part 2 of this two-part review provides guidance on a stepwise approach to the medical treatment of acne in TGD youth, with an emphasis on safety, efficacy, and the delivery of medical care in a culturally humble, thoughtful, and gender-affirming manner.

Phytotherapeutics affecting the IL-1/IL-17/G-CSF Axis: A complementary treatment option for hidradenitis suppurativa? Witte K, Sabat R, Witte-Händel E, et al. *Int J Mol Sci.* 2022 Aug 13;23(16):9057. doi: 10.3390/ijms23169057. <https://pubmed.ncbi.nlm.nih.gov/36012322/>

Hidradenitis suppurativa (HS; also designated as acne inversa) is a chronic inflammatory disease characterized by painful skin lesions that occur in the axillary, inguinal, gluteal and perianal areas of the body. These lesions contain recurring deep-seated, inflamed nodules and pus-discharging abscesses and fistulas. Affecting about 1% of the population, this common disease has gained appropriate clinical attention in the last years. Associated with numerous comorbidities including metabolic syndrome, HS is considered a systemic disease that severely impairs the quality of life and shortens life expectancy. Therapeutic options for HS are limited, comprising long-term antibiotic treatment, the surgical removal of affected skin areas, and neutralization of TNF- α , the only approved systemic treatment. Novel treatment options are needed to close the therapeutic gap. HS pathogenesis is increasingly better understood. In fact, neutrophilic granulocytes (neutrophils) seem to be decisive for the development of the purulent destructive skin inflammation in HS. Recent findings suggest a key role of the immune mediators IL-1 β , IL-17A and G-CSF in the migration into and activation of neutrophils in the skin. Although phytomedicine drugs display potent immunoregulatory properties and have been suggested as complementary therapy in several chronic disorders, their application in HS has not been considered so far. In this review, we describe the IL-1/IL-17/G-CSF axis and evaluate it as potential target for an integrated phytomedicine treatment of HS.

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The synergy between pharmacological regimens and dermocosmetics and its impact on adherence in acne treatment. Araviiskaia E, Layton AM, Estebarez JLL, et al. *Dermatol Res Pract.* 2022 Aug 9;2022:3644720. doi: 10.1155/2022/3644720. eCollection 2022. <https://pubmed.ncbi.nlm.nih.gov/35982914/>

Background: Acne is the most common inflammatory skin disease in adolescence. It is also prevalent in adults, especially females. The disease has a considerable impact on health-related quality of life. Many studies have reported the negative impact of acne on patients due to skin disfigurement, ineffective treatment, and adverse effects of the treatment. Numerous factors contribute towards nonadherence to therapy. Summary: This review discusses the various factors that are related to treatment nonadherence such as ineffective therapy, adverse effects with topical pharmacotherapy such as skin irritation and erythema as well as patient-related factors such as lack of knowledge of disease and a poor patient-physician relationship. Various methods are being adopted to increase adherence to treatments. Increased adherence to acne therapy has been associated with the use of dermocosmetics, such as moisturizers and cleansers. Encouraging the use of dermocosmetics in synergy with pharmacological regimens could support improved treatment adherence resulting in better clinical outcomes for acne patients.

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Lasers for the treatment of erythema, dyspigmentation, and decreased elasticity in macular acne scars: A systematic review. Sarvipour N, Akbari Z, Shafie'ei M, et al. *Lasers Med Sci.* 2022 Aug 3. doi: 10.1007/s10103-022-03621-0. Online ahead of print. <https://pubmed.ncbi.nlm.nih.gov/35918567/>

Scarring is one of the most esthetically challenging and psychologically burdening aspects following inflammatory acne. While "macular" disease is the scar subtype with the least complicated outcome, its phase can be regarded as the most defining in the ultimate scar appearance. Moreover, with lasers recently gaining much popularity in the scientific community for managing several dermatologic conditions, we aimed to evaluate whether they would lead to significant benefits. For this systematic review, four databases consisting of PubMed, Scopus, Embase, and Web of Science were searched using a comprehensive string, with the data from the relevant yet eligible identified records qualitatively synthesized. After investigating the data obtained from the nine included studies, we found the utilized lasers, namely neodymium-doped yttrium aluminum garnet, fractional carbon dioxide, pulsed dye, erbium:glass, pro-yellow, and high-power optically pumped semiconductor, to be highly effective in managing the erythematous or dyspigmented appearance with the reduced elasticity also significantly improving. Moreover, the adverse events were

both bearable and minimal, and transient. However, the degree of improvement each type of scar demonstrated following laser therapy varied based on the laser used. Neodymium-doped yttrium aluminum garnet, fractional carbon dioxide, and pulsed dye are the most commonly investigated lasers for managing macular acne scars, demonstrating eye-catching capabilities in managing either erythema or dyspigmentation. However, we still recommend that further comparative interventional studies be carried out, while the intended outcomes also assessed with objective measures for further clarification.

Innate immunity and microbial dysbiosis in hidradenitis suppurativa - vicious cycle of chronic inflammation.

Chopra D, Arens RA, Amornpaioj W, et al. *Front Immunol.* 2022 Jul 28;13:960488. doi: 10.3389/fimmu.2022.960488. eCollection 2022. <https://pubmed.ncbi.nlm.nih.gov/35967376/>

Hidradenitis Suppurativa (HS) is a chronic multifactorial inflammatory skin disease with incompletely understood mechanisms of disease pathology. HS is characterized by aberrant activation of the innate immune system, resulting in activation of pathways that aim to protect against pathogenic microorganisms, and also contribute to failure to resolve inflammation. Imbalance in innate immunity is evident in deregulation of host antimicrobial peptides (AMPs) and the complement system associated with the microbiome dysbiosis. The pathology is further complicated by ability of pathogens associated with HS to overcome host immune response. Potential roles of major AMPs, cathelicidin, defensins, dermcidin, S100 proteins, RNase 7 and complement proteins are discussed. Dysregulated expression pattern of innate immunity components in conjunction with bacterial component of the disease warrants consideration of novel treatment approaches targeting both host immunity and pathogenic microbiome in HS.

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Combination radiofrequency microneedling and carbon dioxide laser for acne scarring: A systematic review and retrospective case series across two centers.

Mandavia R, Cariati M, Shahidi S, et al. *J Cosmet Dermatol.* 2022 Jul 27. doi: 10.1111/jocd.15276. Online ahead of print. <https://pubmed.ncbi.nlm.nih.gov/35896510/>

Introduction: Combination radiofrequency (RF) microneedling with fractional ablative carbon dioxide (CO₂) laser is a new approach for acne scar treatment. Aims: (1) to systematically review the literature on the safety and effectiveness of this treatment for acne scarring; (2) to assess safety and effectiveness in a 2-center case series. Methods: Systematic review: Articles that assessed the safety and effectiveness of combination RF microneedling and fractional CO₂ laser for acne scarring were included and quality assessed using the Downs and Black checklist. Case series: Patient records were reviewed from 2 clinics, one in London, UK, and the other in Washington D.C., United States, to identify patients who underwent a single treatment with RF microneedling and fractional CO₂ laser for acne scarring. Outcome assessment was via the Scar Global Assessment (SGA) scale. Results: Systematic review: Three articles were included and reported improvements in acne scar severity. Adverse effects included erythema, edema, pain, vesicle formation, erosion, petechiae, desquamation, post-inflammatory hyperpigmentation (PIH), and acne flare. Quality scores ranged from 14 to 15 (maximum of 21). Case series: Twenty-six patients were included. Mean SGA Score was 3.0 at baseline and 1.3 at follow-up. All patients had an improved SGA score. Adverse effects included erythema, pain, edema, skin crusting, PIH, and acne flare. All patients resumed normal activities within 7 days of treatment. Conclusion: Combination RF microneedling and fractional CO₂ laser appears a safe and effective treatment for patients with acne scarring. A single treatment can result in noticeable improvements in acne scar severity with a short recovery time.