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OriginAl reSeArCH

Anti-in ammatory effects of a topical preparation containing nicotinamide, retinol, and 7-dehydrocholesterol in patients with acne: a gene expression study

Enzo Emanuele[1]
Marco Bertona[1] Karmela Altabas[2] Velimir Altabas[2] Giuseppe Alessandrini[3]

[1]Department of Health Sciences, University of Pavia, Pavia, Italy; [2]Clinical Hospital "Sestre Milosrdnice", Zagreb, Croatia; [3]Dermatology Clinics, Ugento, Italy

Purpose: Acne vulgaris is a skin disorder of the sebaceous follicles, involving hyperkeratinization and perifollicular in ammation. Aberrant extracellular matrix remodeling due to matrix metalloproteinases (MMPs) has been associated with the presence of acne conditions. Given the complex pathophysiology of acne, novel topical therapies should include combination products that target multiple pathogenetic mechanisms. In this pilot study we investigated the changes in gene expression of extracellular MMPs, the tissue inhibitors of metalloproteinases, and proin ammatory molecules after 45 days of topical application of a combination product containing nicotinamide, retinol, and 7-dehydrocholesterol in 16 patients with in ammatory acne on their back.

Materials and methods: Skin biopsies were obtained before and after treatment for gene expression studies.

Results: Quantitative real-time polymerase chain reaction revealed a signi cant downregulation of *MMP-1, MMP-2, MMP-9, MMP-14*, interleukin-6, monocyte chemoattractant protein-1, and macrophage migration inhibitory factor. In contrast, the tissue inhibitors of metalloproteinases and transforming growth factor-β1 were signi cantly upregulated. The gene expression ndings correlated well with the clinical treatment response.

Conclusions: The combination of nicotinamide, retinol, and 7-dehydrocholesterol appears to be effective for acne treatment from both clinical and molecular standpoints.

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Acne and Its Relation to Acne Severity: A Case-Control Study

ORIGINAL RESEARCH Vitamin D Levels in Patients with and without

[1] Ahmed Ibrahim Abd Elneam

[1]Department of Dermatology and Cutaneous Surgery, College of Medicine, Qassim University, Buraidah, Saudi Arabia; [2]Clinical Biochemistry, Department of Basic Medical Sciences, College of Medicine, Shaqra University, Dawadmi, Saudi Arabia; [3]Molecular Genetics and Enzymology Department, Human Genetics Division, National Research Centre, Dokki 12622, Cairo, Egypt; [4]Dermatology, Department of Medicine, College of Medicine, Shaqra University, Dawadmi, Saudi Arabia

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Background: Vitamin D plays a signi cant role in the function of the immune system and it in uences many dermatological diseases such as psoriasis and atopic dermatitis. The prevalence of vitamin D de ciency is growing globally, with around 30–50% of people are known to have low levels of vitamin D. Acne vulgaris is a common in ammatory disorder of the pilosebaceous unit. Studies about the role of vitamin D in the pathogenesis of acne vulgaris have shown con icting and nonconclusive results. Thus, the precise purpose of vitamin D has not yet been established.

Objective: First, to evaluate serum levels of vitamin D through a representative sample of patients with acne vulgaris and compare it with matched healthy controls. Second, to investigate if there is a relation between serum vitamin D level and the severity of acne vulgaris. Materials and Methods: This cross-sectional study included 68 patients with acne vulgaris and 50 matched healthy controls. Serum 25-hydroxyvitamin D [25 (OH) D] levels were measured for both patients and healthy controls.

Results: The study yielded lower levels of serum 25-hydroxyvitamin D in patients with acne vulgaris than its level in healthy controls. This is statistically signi cant with P-value = 0.003. Regarding age, gender, and sun exposure, there is no signi cant variation in serum 25-hydroxyvitamin D level. Also, no signi cant difference between the severity of acne and serum 25-hydroxyvitamin D levels.

Conclusion: This study has shown clearly that vitamin D de ciency is more frequent in patients with acne with P-value = 0.003. However, no signi cant association between the serum level of 25-hydroxyvitamin D [25 (OH) D] and the severity of acne vulgaris. Further clinical trials on a larger scale are needed to address the importance of vitamin D in acne vulgaris. Speci cally, determining whether treatment of acne with both topical vitamin D analogs and vitamin D supplementation is of signi cant effect.

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The vitamin D pathway: a new target for control of the skin's immune response?

Jürgen Schauber[1] and **Richard L. Gallo**[2]
[1]Department of Dermatology and Allergology, Ludwig-Maximilians-University, Munich, Germany

[2]Division of Dermatology, University of California and VASDHS, San Diego, CA, USA

Abstract

The surface of our skin is constantly challenged by a wide variety of microbial pathogens, still cutaneous infections are relatively rare. Within cutaneous innate immunity the production of antimicrobial peptides (AMPs) is a primary system for protection against infection. Many

AMPs can be found on the skin, and these include molecules that were discovered for their antimicrobial properties, and other peptides and proteins first known for activity as chemokines, enzymes, enzyme inhibitors and neuropeptides. Cathelicidins were among the first families of AMPs discovered on the skin. They are now known to have two distinct functions; they have direct antimicrobial activity and will initiate a host cellular response resulting in cytokine release, inflammation and angiogenesis. Dysfunction of cathelicidin is relevant in the pathogenesis of several cutaneous diseases including atopic dermatitis where cathelicidin induction is suppressed, rosacea, where cathelicidin peptides are abnormally processed to forms that induce cutaneous inflammation and a vascular response, and psoriasis, where a cathelicidin peptide can convert self-DNA to a potent stimulus of an autoinflammatory cascade. Recent work has unexpectedly identified vitamin D3 as a major factor involved in the regulation of cathelicidin expression. Therapies targeting the vitamin D3 pathway and thereby cathelicidin may provide new treatment modalities in the management of infectious and inflammatory skin diseases.

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Antimicrobial implications of vitamin D

Dima A. Youssef,[1,2] Christopher w.T. Miller,[3] Adel M. el-Abbassi,[1,2] Della C. Cutchins,[1] Coleman Cutchins,[5] william B. Grant[4] and Alan N. Peiris[1,2,*]

[1]Mountain Home vAMC Medicine Service; Mountain Home; and [2]Department of internal Medicine; James H. Quillen College of Medicine; east Tennessee State University; Johnson, TN USA; [3]Department of Psychiatry; University of Maryland; Baltimore; [4]Sunlight, Nutrition and Health research Center (SUNArC); San Francisco, CA USA; [5]Candidate for PharmD 2011; east Tennessee State University; College of Pharmacy; Johnson, TN USA

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evidence exists that vitamin D has a potential antimicrobial activity and its de ciency has deleterious e ects on general well-being and longevity. vitamin D may reduce the risk of infection through multiple mechanisms. vitamin D boosts innate immunity by modulating production of anti-microbial peptides (AMPs) and cytokine response. vitamin D and its analogues via these mechanisms are playing an increasing role in the management of atopic dermatitis, psoriasis, vitiligo, acne and rosacea. vitamin D may reduce susceptibility to infection in patients with atopic dermatitis and the ability to regulate local immune and in ammatory responses o ers exciting potential for understanding and treating chronic in ammatory dermatitides. Moreover, B and T cell activation as well as boosting the activity of monocytes and macrophages also contribute to a potent systemic anti-microbial e ect. The direct invasion by pathogenic organisms may be minimized at sites such as the respiratory tract by enhancing clearance of invading organisms. A vitamin D replete state appears to bene t most infections, with the possible noteworthy exception of Leishmaniasis. Antibiotics remain an expensive option and misuse of these agents results in signi cant antibiotic resistance and contributes to escalating health care costs. vitamin D constitutes an inexpensive prophylactic option and possibly therapeutic product either by itself or as a synergistic agent to traditional antimicrobial agents. This review outlines the speci c antimicrobial properties of vitamin D in combating a wide range of organisms. we discuss the possible mechanisms by which vitamin D may have a therapeutic role in managing a variety of infections.

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REVIEW

Hormonal treatment of acne vulgaris: an update

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Mohamed L Elsaie

Department of Dermatology and Venereology, National Research Centre, Cairo, Egypt

Abstract: Acne vulgaris is a common skin condition associated with multiple factors. Although mostly presenting alone, it can likewise present with features of hyperandrogenism and hormonal discrepancies. Of note, hormonal therapies are indicated in severe, resistant-to-treatment cases and in those with monthly are-ups and when standard therapeutic options are inappropriate. This article serves as an update to hormonal pathogenesis of acne, discusses the basics of endocrinal evaluation for patients with suspected hormonal acne, and provides an overview of the current hormonal treatment options in women.

Keywords: acne, hormones, hyperandrogenism