Editorial

The skin-gut axis: Expanding the dermatologist's clinical perspective

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Dermatology usually focuses on visible cutaneous diseases; however there is an increase in evidence highlighting the bidirectional influence between skin inflammation and intestinal microbial health. Chronic inflammatory dermatoses such as atopic dermatitis and psoriasis as well as common dermatoses like acne frequently persist despite appropriate topical and systemic therapies, suggesting that their etiopathogenesis extends beyond the skin surface. Recent systematic reviews have proved consistent associations between alterations in gut microbiota and several inflammatory skin disorders, favoring a more integrative disease model.[1]

The concept of the skin-gut axis suggests that the gastrointestinal microbiome acts as a systemic immunomodulatory organ, affecting distant tissues through metabolic, immune and neuroendocrine pathways. Mechanistic and narrative reviews have shown that dysbiosis may promote immune imbalance, systemic inflammation and barrier dysfunction, which can appear clinically as cutaneous disease.[2,3] This framework motivates dermatologists to consider recalcitrant or chronic skin disease as a possible sign of underlying immune or microbial dysregulation.

The Clinical relevance of skin-gut axis is most evident in inflammatory conditions such as atopic dermatitis, psoriasis and acne. Changes in composition and diversity of gut microbiome have been correlated with cytokine profiles and disease severity, specifically involving Th17-mediated pathways.[3-5] Bacteria producing short-chain fatty acid, are often reduced in dysbiosis, hence play an important role in maintaining immune tolerance and epithelial integrity, and their depletion may leas to chronic skin inflammation. There is a shift of T-cell balance towards Th17-driven inflammation as a result of gut dysbiosis and barrier dysfunction, correlating intestinal immune disturbance to etiopathogenesis of psoriasis.[3-5]

There is an extension of the dermatologist's clinical interpretation as a result of recognition of this skin-gut axis. Gastrointestinal comorbidities, dietary patterns, and antibiotic exposure are increasingly identified as relevant modifiers of skin disease expression. An expanding body of research emphasizes that dermatologic and gastrointestinal disorders often coexist, emphasizing shared immunological and microbial mechanisms.2-4 While dermatologists should not assume correlation in every case, but for treatment-resistant disease, there should be selective screening for gastrointestinal symptoms.

In our region, the skin-gut dialogue is particularly relevant due to antibiotic overuse, westernization in diet and rapid shift towards urban lifestyle. Broad-spectrum antibiotic usage disrupts the commensal gut flora and may precipitate inflammatory cycles in

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predisposed individuals. Reviews discussing microbiome-targeted interventions focus on the need for caretaking of antibiotic usage as a main strategy for maintaining microbial balance and decreasing inflammatory cascade, thus governing various dermatological diseases.[6]

As a result of excessive consumption of westernized diets, there is a loss of microbial diversity leading to increased inflammatory disease susceptibility in many skin disorders.[1,5]

Therapeutically, strategies that regulate microbiome such as probiotics, prebiotics, and nutraceutical use show growing but variable evidence. Systematic reviews suggest that in some selected conditions, there are modest benefits in reducing inflammatory markers and disease severity, though difference in study design limits universal endorsement.[1,6] Most importantly, these treatment approaches should complement, not replace, evidence-based dermatological treatments. At the same time, it is important to avoid generalization. Not all skin diseases originate from a pathology in gut, so generalization may lead to patient misconception. Current literature supports a balanced, evidence based approach in which the skin-gut axis improves clinical outcome without underestimating the established standards of care.[2]

The skin-gut axis represents a meaningful extension of dermatologic understanding rather than a temporary trend. By recognizing the influences of gut microbiota on inflammatory and immune pathways, dermatologists can adopt a more refined and holistic approach especially in chronic, relapsing, or treatment-resistant diseases. This framework is particularly relevant in our region, where lifestyle and environmental factors shape microbial health. Incorporating microbiome awareness into clinical practice may upgrade patient outcomes while strengthening rational and system-based dermatologic care.

Key Messages

- Gut microbiota plays a systemic immunomodulatory effect applicable to inflammatory skin diseases.
- Dysbiosis has associations with psoriasis, atopic dermatitis, and acne.
- Antibiotic exposure and dietary habits are main modifiers of the skin-gut axis.
- Microbiome-targeted interventions should be considered as an adjuvant and evidence-dependent.
- Balanced integration enhances, rather than substitutes, standard dermatologic practice.

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