Understanding and Addressing the Acne Vulgaris Paradigm Shift

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A paradigm shift has occurred in our understanding of the pathogenesis and pathophysiology of acne vulgaris (AV). The outdated paradigm posited that AV lesions initially developed after abnormal desquamation of the keratinocytes that line the sebaceous follicle, which induced hyperkeratinization and comedogenesis.[1,2] The pathological process in AV was then facilitated by an increase in circulating androgens at the onset of puberty, which stimulated the production of sebum in the pilosebaceous unit, creating a milieu that was conducive for the colonization with *Propionibacterium acnes*[1,2]

In 2003, however, Jeremy et al published a landmark study which revealed that the involvement of inflammatory responses is fundamental to the earliest stages of AV lesion development and occurs during hyperkeratinization.[3] Subsequent studies have further demonstrated that cellular inflammatory events are present at every stage of AV, from subclinical manifestations to the clinical presentation of active lesions.[4]

In this supplement I will review the various inflammatory biomarkers and mechanisms that have been implicated in AV, as well as how the inflammatory processes continue even after the resolution of papules and pustules, which leads to hyperpigmentary changes and scarring. Finally, I will address our new understanding of the role *P. acnes* plays in the pathogenesis of AV.

My colleague Joshua Zeichner MD will go over the novel treatment modalities for AV that address the new paradigm of AV pathogenesis. Additionally, bacterial resistance to antibiotics has become a clinically relevant concern not only globally but also in day to day acne treatment since this practice of overuse or inappropriate use of antibiotics in dermatology has resulted in extensive treatment failure. In the wake of antibiotic resistance and failure to treat AV, benzoyl peroxide has emerged as an efficacious treatment for AV, especially in fixed combination formulations with other topical antibiotics or retinoids. Therefore, as our understanding of the pathogenesis of AV is evolving, the new treatment paradigm is also shifting now to more anti-inflammatory agents.

Finally, the constant presence of inflammation in AV, from the genesis to the end of lesion progression, may even force us to drop the existing nomenclature of "non- inflammatory lesions" for "open and closed comedones", given that these are actually inflammatory in nature!

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DISCLOSURES

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