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A Prospective Multicenter Study of Laser-Activated Gold Microparticles for Treating Patients Using Concomitant Topical Retinoids for Mild-to-Moderate Inflammatory Acne

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ABSTRACT

Gold microparticles are indicated as an accessory to 1064 nm lasers to facilitate photo-thermal heating of sebaceous glands for treating mild-to-moderate inflammatory acne vulgaris (Sebacia™ Microparticles, Coronado Aesthetics™ LLC, Southlake, TX). The following study assessed the safety and clinical benefit of gold microparticles/laser therapy when used together with commercially available topical acne products. Healthy patients, 12 to 45 years old with mild-to-moderate inflammatory facial acne, were prescribed a topical pre-treatment retinoid for 3 to 4 weeks. The gold microparticle suspension was then applied to the entire face and massaged into the skin. The laser procedure was performed with commercially available 1064 nm Nd:Yag lasers with fluence in the 20 to 35 J/cm² range, a 30 ms pulse duration, and direct cooling. Among participants completing the study (N=52), the mean percent change in inflammatory lesion counts (ILC) was -55% at month 2, reaching -68% at month 12. At that time, 86% of participants achieved a 40% decrease in ILC and 75% achieved a 60% decrease in ILC. Mean Investigator's Global Assessment (IGA) Scale scores decreased by 41.6% from 2.4 at day 0 to 1.4 at month 12. The percentage of participants with clear or almost clear skin increased from 7% at day 0 to 59% at month 12. Acne therapy with topically applied gold microparticles followed by 1064 nm laser irradiation is an effective treatment for moderate to moderately severe acne. The treatment was well-tolerated with a high degree of participant satisfaction.

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INTRODUCTION

Acne vulgaris is a chronic inflammatory skin disease affecting the pilosebaceous follicles.¹ It is estimated that 40 to 50 million individuals in the US have acne with an 85% prevalence rate among those aged 12 to 24 years old.¹ Most patients affected by acne present with a combination of inflammatory and non-inflammatory lesions. Non-inflammatory acne lesions include open and/or closed comedones, while inflammatory lesions manifest as papules, pustules, nodules, and/or cysts.^{2,3} The disease is associated with a prolonged, remitting, and relapsing course, generally beginning in adolescence and sometimes continuing into adulthood.⁴ Physical scars and dyschromias in the skin are also common in the disease.⁵ Understandably, acne imparts a serious psychological burden on affected individuals, including anxiety, depression, and social withdrawal.^{6,7}

Sebaceous gland differentiation and sebum production are regulated by a complex interplay of hormones, especially androgens.^{8,9} At the cellular level, peroxisome proliferator-activated receptors located on sebocytes increase sebaceous gland lipogenesis and sebum production.¹⁰ Together with the stratum corneum, sebum is important to the integrity and normal function of the skin, acting as a lubricant and barrier to the external environment; however, excess sebum production facilitates *Cutibacterium acnes* proliferation by providing nutrients and creating an anaerobic environment for bacterial growth. As a result, excess sebum is an important contributor to the inflammatory processes underlying the development of acne vulgaris.¹¹