

Topical ALA-Photodynamic Therapy for Acne Can Induce Apoptosis of Sebocytes and Down-regulate Their TLR-2 and TLR-4 Expression

Annals of Dermatology

[2011, vol.23, no.1, pp. 23-32 \(10 pages\)](#)

발행기관 : 대한피부과학회

연구분야 : 의학학 > 피부과학

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초록 

Background: Although photodynamic therapy (PDT) is widely performed for acne, little is known about its exact therapeutic mechanism. Objective: We aimed to estimate the efficacy and safety of PDT on acne and to discover its mode of action. Methods: We performed PDT on 12 patients with mild to moderate acne. The clinical efficacy was assessed by counting the acne lesions and measuring the sebum secretion before and after PDT. In addition, we took biopsy samples from the peri-lesional areas before and after 3-session of PDT. To examine the degree of apoptosis of the sebaceous follicles, TUNEL assay was performed. To investigate the changes of toll-like receptor (TLR)-2 and TLR-4 expression after PDT, immunohistochemical stainings were also carried out. Finally, we performed TUNEL assay using the cultured sebocytes to confirm the apoptosis of sebocytes in vitro after PDT. Results: There was a significant reduction in the number of inflammatory acne lesions after PDT, compared to baseline ($p < 0.05$). Sebum excretion significantly decreased 2 weeks after the first PDT session except for one patient ($p < 0.05$). The TUNEL positive cells in the peri-lesional sebaceous glands after PDT markedly increased, compared with those of before PDT. A decrease in TLR-2 and TLR-4 expression by sebaceous glands and epidermis after PDT was 50% and 30%, respectively. Conclusion: Our results demonstrate that apoptosis of the sebaceous glands is associated with improvement of acne by PDT. PDT has shown to down-regulate TLR-2 and TLR-4 expression in the sebaceous glands and epidermis of acne patients. (Ann Dermatol 23(1) 23~32, 2011)

키워드 

Acne vulgaris, Aminolevulinic acid (ALA), Apoptosis, Photodynamic therapy (PDT), Toll-like receptor (TLR)

