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Cellular Features of Psoriatic Skin: Imaging and Quantification Using In Vivo Reflectance Confocal Microscopy

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ABSTRACT

Background: In vivo reflectance confocal microscopy (RCM) is a novel, exciting imaging technique. It provides images of cell- and tissue structures and dynamics in situ, in real time, without the need for ex vivo tissue samples. RCM visualizes the superficial part of human skin up to a depth of 250 μm . In psoriasis, an erythematous squamous skin disease, we evaluated well known histological features of stable psoriasis vulgaris (PP) with RCM. RCM images were correlated to morphological and cell biological findings in routine HE and immunohistochemical stained histology with CD3 and antifilaggrin antibodies.

Methods: Lesional and nonlesional skin of eight patients with PP were evaluated with RCM, after which 4-mm punch biopsies were taken and cut vertically in two equal parts. One part was processed in the conventional vertical way, the other horizontally (en face) for optimal correlation to RCM images. We evaluated and quantified nine histopathological features of psoriasis: parakeratosis, epidermal and dermal inflammatory infiltrate, diminished or absent stratum granulosum, epidermal thickening, thinning of the suprapapillary epidermal plate, increased height of the papillary dermis, increase in number of dermal papillae and increase in number and volume of papillary capillaries.

Results: Quantification and evaluation of cell biological and histological features of PP with RCM correlated highly to evaluation in HE, CD3 and filaggrin-stained histology.

Conclusions: RCM is a novel technique which can be used for real time, cytometric evaluation and quantification of PP features. RCM might be suited equally for cytometric evaluation of other superficial tissues.