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Clinical, biophysical, immunohistochemical, and in vivo reflectance confocal microscopy evaluation of the response of subjects with sensitive skin to home-use fractional non-ablative photothermolysis device.

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ABSTRACT

BACKGROUND: Fractional photothermolysis using professional devices is a well-accepted and a widely used technique for skin rejuvenation. Recently, the technology has also been implemented in devices for home-use. Yet, a subpopulation of consumers exists that reacts excessively to this stimulation and reports "sensitive skin" (SS). **OBJECTIVE:** The goal of this study was to evaluate the response of subjects with SS and NSS to fractional non-ablative photothermolysis to provide additional insights in the pathophysiology of SS. **METHODS:** Subjects with SS and non-sensitive skin (NSS), selected using a proprietary questionnaire were stimulated by applying a home-use fractional non-ablative photothermolysis device. Self-reported perceptions and objective effects were evaluated after 0.5, 8, 24, and 72 hours by clinical, biophysical and immunohistochemical assessment, and in vivo reflectance confocal microscopy (RCM). **RESULTS:** Significantly fewer mast cells were found in SS compared to NSS subjects, 0.5 and 72 hours after stimulus based on tryptase staining, and SS subjects report discomfort more frequently. Immunohistochemical biomarkers revealed new insights in the effects of fractional non-ablative photothermolysis, which were supported by RCM: peri- and interlesional epidermal proliferation, and changes in keratinocyte differentiation. **CONCLUSION:** Previously, we have already reported that SS could be elicited by mechanical and chemical stimuli. Thus, mild yet excessive self-reported perceptions described here supports the hypothesis about existence of generalized skin sensitivity. Furthermore, it supports a view point suggesting involvement of TRPV1 receptors in this phenomenon. While histological evaluation, in line with our previous results points to the role of mast cells in SS, overall, however, fractional non-ablative photothermolysis causes only mild damage, nearly equal in SS and NSS and could be used as an in vivo model for skin regeneration without manipulating the skin barrier. *Lasers Surg. Med.* © 2016 Wiley Periodicals, Inc. © 2016 Wiley Periodicals, Inc.

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