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Is superficial burn caused by ultraviolet radiation (sunburn) comparable to superficial burn caused by heat--a histomorphological comparison by in vivo Reflectance-Mode-Confocal Microscopy.

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ABSTRACT

BACKGROUND: Regardless of the underlying cause, both sunburn and superficial thermal injuries are classified as first-degree burns, since data on morphological differences are scarce. Reflectance-Mode-Confocal Microscopy (RMCM) enables high-resolution non-invasive investigation of the human skin.

OBJECTIVE: We studied in vivo histomorphological alterations in both sunburn and superficial thermal injuries using RMCM.

METHODS: Ten patients (6 female, 4 male; aged 28.4 +/- 10.6 years) with first-degree thermal-contact Injuries (TI group), and 9 sunburned patients (SB group; 7 female, 2 male; aged 30.2 +/- 16.4 years), to a maximum extent of 10% of the body surface were evaluated 24 h after burn injury using RMCM. The following parameters were obtained using RMCM: stratum corneum thickness, epidermal thickness, basal layer thickness, granular cell size.

RESULTS: Compared to the controls (12.8 +/- 2.5 microm), stratum corneum thickness decreased significantly to 10.6 +/- 2.1 microm in the TI group, whereas it increased significantly to 16.4 +/- 3.1 microm in the SB group. The epidermal thickness did not differ significantly in the TI group (47.9 +/- 2.3 microm) and SB group (49.1 +/- 3.5 microm); however, both increased significantly compared to their respective controls (41.8 +/- 1.4 microm). The basal layer thickness increased more in the SB group compared to the TI group (17.9 +/- 1.4 microm vs. 15.6 +/- 1.1 microm). Both differed also significantly compared to their controls (13.8 +/- 0.9 microm). The granular cell size increased significantly in both groups compared to the controls (731 +/- 42 microm); however, a significantly higher increase was observed in the TI group (852 +/- 58 microm) compared to the SB group (784 +/- 61 microm).

CONCLUSIONS: Ultraviolet radiation seems to influence predominantly deeper epidermal layers, whereas heat-induced burns affect more superficial epidermal layers. The term 'First-degree burn' should not be used synonymously for sunburn and superficial thermal burn injuries. Conflicts of interest None declared.