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**In vivo reflectance-mode confocal microscopy assessments: impact of overweight on human skin microcirculation and histomorphology.**

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### **ABSTRACT**

Abstract. Reflectance-mode confocal microscopy (RCM) enables in vivo assessment of the human skin. Impact of overweight on both human skin microcirculation and histomorphology has not been investigated in vivo. The purpose of this study is to evaluate both microcirculation and histomorphology in vivo in overweight. In 10 normotensive overweight nondiabetic individuals (OW-group, BMI  $29.1 \pm 2.7$  kg/m<sup>2</sup>) and 10 age- and sex-matched healthy lean controls (CO-group, BMI  $20.4 \pm 1.9$  kg/m<sup>2</sup>) the following parameters were evaluated using RCM: dermal blood cell flow (DBCF), density of dermal capillaries (DDC), epidermal thickness (ET), and epidermal cell size (ECS). DBCF was counted at  $63.11 \pm 4.14$  cells/min in OW-group and at  $51.06 \pm 3.84$  cells/min in CO-group ( $P < 0.05$ ). DDC was reduced in OW-group ( $4.91 \pm 0.39$  capillaries/mm<sup>2</sup>) compared to the controls ( $6.02 \pm 0.64$  capillaries/mm<sup>2</sup>,  $P < 0.05$ ). Histometric evaluation of ET reveals thickening in OW-group compared to the CO-group ( $54.79 \pm 4.25$  μm versus  $44.03 \pm 3.11$  μm,  $P < 0.05$ ). ECS differed significantly ( $P < 0.05$ ) in OW-group ( $821.3 \pm 42.02$  μm<sup>2</sup>) compared to the controls ( $772.6 \pm 34.79$  μm<sup>2</sup>). Inverse correlation of dermal capillary density and overweight point to reduced total tissue perfusion while positive related blood cell flow reveals vasodilatation. Increase of both ET and cell size indicates remodeling of cutaneous histomorphology, maybe as an early stage of adiposity-related skin condition.