Assessment of scalp microvascular function

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The microcirculation plays a pivotal role in metabolic processes essential for optimal organ function. Likewise, scalp perfusion may be essential for scalp health and hair growth. However, well-defined methods to measure microcirculation and microvascular function in the scalp are not available yet.

Aim: To determine whether the methodology to assess skin microvascular function on the forearm by means of a local heat stimulus can be applied to the scalp in subjects with a full head of hair.

Method: On two separate days, scalp (at the parting) and dorsal forearm skin microcirculation with and without a gel-filled heating probe of 44°C were simultaneously assessed using a Full Field Laser Perfusion Imager in 20 healthy subjects.

Results: Baseline microcirculation (flux) was twice as high in the scalp compared to forearm. Upon heat stimulus, scalp flux increased by 65% during the axon-mediated response (P1) and by 89% during the NO-mediated response (P2) relative to baseline. For the forearm this was 165% and 219%, respectively. The within-subject variation of baseline, P1 and P2 for the forearm was 25.4%, 26.7% and 33.2% and for the scalp 26.7%, 26.1% and 25.6%, respectively. There was no correlation between forearm and scalp microvascular function.

Conclusions: Scalp microvascular function may be assessed by the local thermal hyperemia method in subjects with a full head of hair with similar reproducibility as in the forearm.