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### MEETING ABSTRACT

#### A2.40

#### Use of remote photoplethysmography in assessment of topical corticosteroid-induced skin blanching

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**Background:** Topically applied corticosteroids are frequently prescribed as local therapeutic treatment. The human skin-blanching assay proposed by McKenzie [1], for the assessment of bioavailability of topical corticosteroids has been in use for decades. Hence, in spite of technological advancements, the intensity of the drug-induced blanching is still assessed subjectively by eye, as existing techniques (reflectance spectroscopy) are complex and expensive. The simple and cost-effective alternative to existing methods is remote photoplethysmography, with its ability to non-intrusively acquire signals by means of a light source and a video camera.

**Objectives:** To evaluate the reliability of remote photoplethysmography in assessment of topical corticosteroid-induced skin-blanching.

**Methods:** Five healthy volunteers gave informed consent and participated in the present pilot study. To produce skin blanching, an adhesive plaster (15×15 mm area) containing 0.02 ml of clobetasol-17-propionate ointment (Dermovate<sup>®</sup> 0.5 mg/g, GlaxoSmithKline), was applied on the volar aspect of the right forearm for 12 hours. Thirty minutes after plaster removal, remote photoplethysmography (rPPG) signal was acquired (camera Ximea xiQ, at 100 Hz per channel) from blanched and surrounding skin regions at 530 nm and 810 nm light source illumination. To compare signals, PPG AC and DC components were compared for both wavelengths and sites (blanched and intact skin).

**Results:** The corticosteroid ointment produced substantial blanching of non-glabrous skin in all subjects. However, there was no statistically significant difference between rPPG AC signal amplitude acquired from blanched and intact skin regions, whereas the blanched skin region displayed a statistically significant increase (8–12%) of DC component amplitude only at 530 nm illumination, indicating on a non-pulsatile nature of the observed vascular response, possibly originated from reduced functional capillary density due to long-lasting vasoconstriction of arterioles supplying superficial cutaneous vascular plexus. Using DC component mapping it was possible to automatically select and evaluate the blanched skin region.

**Conclusions:** Remote photoplethysmography can provide objective assessment of blanching intensity and in future could be utilised in determination of steroid topical bioavailability.

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**Keywords:** vasoconstrictor assay – topical corticosteroids – remote photoplethysmography

#### Reference

1. McKenzie AW, Stoughton RB: **Method for comparing percutaneous absorption of steroids.** *Arch Dermatol*, 1962; 86(5):608–610.  
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