11th World Congress on Pain Selected Abstracts - Selected Abstracts

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A new approach to simultaneously monitor (sympathetic) vasomotor reactions of skin and underlying deep tissues in man

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Aim of Investigation: The assessment of vasomotor functions of skin and underlying deep tissues like muscle and bone is of general clinical interest. This also holds for certain pain states, e.g. complex regional pain syndrome (CRPS). Reliable methods are available for skin, but there has been no appropriate method to electively monitor blood flow in deep tissues. Consequently, little is known about bone vasomotor control in man. Here we report about a new approach, which allows differential and simultaneous evaluation of vasomotor reactions in these tissues.
Methods: Laser-Doppler-spectroscopy (O2C, LEA, Giessen, Germany) was used to study blood flow in various combinations of detection depths (2, 8 and 16 mm) and of recording sites in hairy skin (dorsal side of thumb/forearm), glabrous skin (palm), muscle (interosseus I, forearm flexors/extensors) and bone (distal radial and ulnar sites/proximal phalanx of thumb). Standard stimuli (contralateral static handgrip, apnoea, valsalva manoeuvre, rebreathing) were used (n=105) to reflexively influence blood flow in 9 healthy subjects (mean age: 32 yrs., 3 female, 6 male). Flow could be evaluated at 340 recording sites (skin: 150, muscle: 86, bone: 104).
Results: Vasomotor reflexes depended on both, the kind of stimulus and the tissue under study. In hairy skin, usually no or only weak responses were found upon all kinds of stimuli. Valsalva manoeuvre and rebreathing during stimulation elicited a differential reflex pattern in glabrous skin (mostly flow decrease) vs. deep tissues (mostly flow increase), apnoe showed more variable results. Contralateral handgrip consistently led to flow increases, being more pronounced in deep tissues vs glabrous skin. Interestingly, reflex changes of bone blood flow were clearly to identify and recovery time was typically more prolonged compared to muscle sites.
Conclusions: This new approach allows a comprehensive judgement of vasomotor functions and may well be used in painful diseases inflicting vasomotor disturbance, like CRPS.

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