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Pain 1
Somatosensory evoked potentials to painful and painless electrical stimulation (SSEPEES). A tool for the clinical assessment of neuropathic pain pathways?

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Background: SSPEs with N1 latency of ~140 ms and Ad range velocity are recorded with painful and painless electrical stimulation (ring electrodes). Intradermal electrodes have been used for specific stimulation of the thermoalgesic pathways. Similar potentials are obtained with other sensory modalities, described as reflecting the saliency rather than the nature of the stimuli.
Objective: To reassess whether recorded SSPEs can reliably index their afferent pathway function.
Methods: 26 controls, mean age 41 years ± SD13.1 (range27-71). VAS graded stimulation (ring electrodes) to 3rd finger and 2nd toe with 2 stimuli of 0.5 ms and ISI = 5 ms at frequencies between 0.1-1Hz. Recordings at Cz-A1A2 (ten 2 s epochs averaged twice). The effect of compression block, and of magnetic and heat stimulation (CHEPS, Medoc) were also investigated. Subject consent and institutional approval obtained.
Results: N1-P1 amplitude increased with increasing VAS graded stimulus intensity. N1 latency across VAS grades did not change. No potentials recorded with threshold stimuli (VAS = 0). Mean N1-P1 amplitude decreased with increasing stimulation frequency. No change in amplitude was seen for each of 4 levels of VAS graded stimuli when their order of presentation was changed. Magnetic and heat stimulation elicited similar potentials. Arm compression block resulted in diminishing N1 amplitude and paraesthesiae at 5 min, unrecordable at 15 min (cold perceived as hot and light touch and pinprick absent then), and unrecordable potential at 20 min.
Conclusion: N1-P1 amplitude and latency at 0.1 Hz seem robust parameters. Further testing in patients with thermoalgesic pathways pathology is advisable.

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Pain 1
Contact heat evoked potentials (CHEPS) in patients with painful and non-painful polyneuropathies

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Background: CHEPS evaluate central and peripheral thermo-algesic pathways. There are few studies comparing CHEPS in polyneuropathies and central nervous system disorders with and without neuropathic pain.
Objective: To compare CHEPS in controls and patients with polyneuropathies and central nervous system disorders(CNS) with and without neuropathic pain.
Patients and methods: 58 M, 70 F. Mean age 52.5 years (range 21–83). 27 normal controls. 53 polyneuropathies with sensory involvement (16 small fibre), 39 painful. 25 had CNS disease, 17 painful. 21 had other peripheral conditions. CHEPS (Medoc, Israel) thermode was placed on the distal forearm and leg, baseline T° 37 °C, target T° 54 °C. Random interstimulus interval 10–15 seconds. 2 trains of 10 stimuli averaged and superimposed recorded from CZ-A1/A2. Filters 3–100 Hz. N2 latency and N2-P2 amplitude measured. Parametric and non-parametric statistics as appropriate.
Results: The morphology of CHEPS was similar in central and peripheral lesions. CHEPS were absent in the legs significantly more in all groups than in controls. The mean amplitudes in lower limbs in painful and non-painful polyneuropathies and in CNS disease were smaller than in controls. Mean N2 latency was prolonged (compared to controls only) in the arm of CNS diseases and in the leg of painful polyneuropathies and non painful CNS diseases.
Conclusions: CHEPS seems to be a reliable technique to assess the thermoalgesic pathway in sensory polyneuropathies and CNS disorders. The technique did not differentiate between painful and non-painful polyneuropathies nor between sensory polyneuropathies and CNS lesions.

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