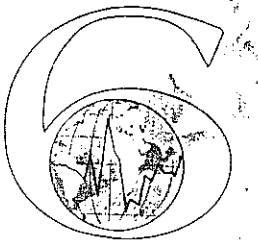

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GIANT SOMATOSENSORY EVOKED POTENTIALS IN DIFFERENT CLINICAL CONDITIONS: SCALP TOPOGRAPHY AND DIPOLE SOURCE ANALYSIS

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Scalp topography and equivalent dipoles (EDs) of giant SEPs to median nerve stimulation were investigated in 14 patients: 6 with cortical myoclonus; 3 with unilateral porencephalic lesions; 3 with benign childhood epilepsy with centrotemporal spikes (BCECS); and 2 with Down's syndrome. Spherical spline maps of amplitudes and current source densities were computed for different SEP peaks recorded from 20 scalp electrodes. Dipolar sources were modelled by means of a spatio-temporal analysis (BESA). Five sets of early cortical components contralateral to the stimulated limb were identified in topographic maps of normal subjects: a parieto-frontal N20-P20 complex; a central positivity, P22; a parieto-frontal P27-N30 complex; a central negativity, N33; and a central-parietal positivity, P45. The first four components were optimally explained by two EDs: one tangential, modelling both the N20-P20 and the P27-N30 complexes, was located close to the posterior bank of the central sulcus; a radially oriented dipole, explaining the P22 and N33 peaks, was situated in peri-rolandic cortex (crown of pre/postcentral gyrus).

In all patients except those with BCECS, these early cortical SEP components were identified: depending on the patient, either tangential or radial components alone, or both components, were enhanced. EDs were more easily distinguishable as compared with normal SEPs and the radial dipole was located anterior to the central sulcus, in the crown of precentral gyrus. The two patients with BCECS showed an extreme enhancement of component N60, with a temporal-frontal field explained by a tangential dipole, never observed in normal subjects. It appears that giant SEPs originate mainly from the same cortical sources as normal SEPs.

THE LATENCY OF SOMATOS
AND TEMPORAL

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The peak latency of the somatosensory cereb
800 μm displacement was calculated to be
(3.5ms were subtracted for the receptor del
250 μm, 125 μm, 50μm and 25μm) produ
between 800μm and 25μm displacements an
used by the mechanisms of the temporal su
system is about 9ms under the conditions of

The stimulus time course was the same f
indentation phase of the skin was always
intensities of the stimulus. It seems, therefo
on the duration of the afferent discharge, b
shorter the summation time. This results
peripheral stimulus, producing a long lasting