

ELECTROENCEPHALOGRAPHY

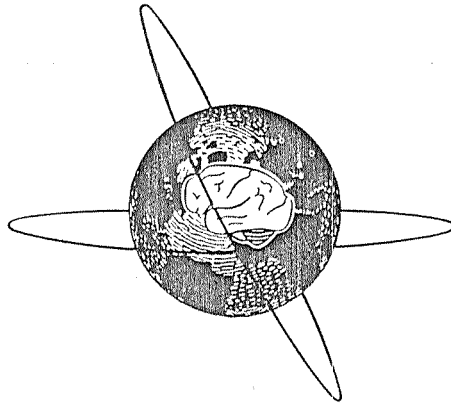
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CLINICAL NEUROPHYSIOLOGY

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- 1. Selective micro-structural modifications of sleep under conditions of acoustic perturbation.** - M.G. Terzano, L. Parrino, G. Fioriti, M.C. Spaggiari, S. Anelli, T. Arcelloni and G. Ambiveri (Dept. of Neurology and USL N4, Parma)

Within the organization of normal NREM sleep, it is possible to distinguish 2 complementary functional states, each characterized by a peculiar EEG arrangement: (a) the cyclic alternating pattern (CAP), correlated with long-lasting fluctuations of arousal level and autonomic activities ('excited state'); (b) non-CAP (NCAP), closely related to a relatively marked stability of the biological rhythms ('stationary state'). Since CAP may be evoked during NCAP by means of subawakening stimuli, the ratio CAP time to sleep time (CAP rate) can be enhanced through a controlled perturbation. After an adaptation night to the sleep lab, 12 healthy young adults underwent randomly 2 polysomnographic recordings under: (1) basal ambient conditions (Leq < 30 dBA); (2) continuous 45 dBA white noise. Although no remarkable variations emerged in the classical sleep variables and MSLT, the acoustic perturbation induced a deterioration of subjective sleep quality correlated with a significant increase of CAP rate during total NREM sleep (+120%, $P < 0.0001$), and during deep sleep (+216% in S4). Environmental perturbation, even of mild degree, may therefore induce significant micro-structural changes, which are reflected in an impairment of the restorative functions of sleep.

- 2. Functional EEG: cognitive functions - assessment with task-dependent EEG asymmetry with focal brain lesions.** - L. Murri, E. Bonanni, R. Massetani, M. Mancino, C. Navona and F. Denoth (Dept. of Neurology and IEI-CNR, Pisa)

EEG asymmetry in normal right-handed subjects during cognitive tasks has long been used to study the functional specialization of the two hemispheres. In this study, the asymmetry technique was used in patients with left brain lesions following acute supratentorial unilateral infarction.

Twenty-six right-handed patients (14 males and 12 females, age range 62-78 years), all with right hemiplegia, were studied:

14 showed very severe receptive or global aphasia and 12 were without language disorders.

EEG activity was recorded from P4-O2 and P3-O1, analysing total power and power associated with single frequency bands for 5 sec epochs. During EEG recording meaningful and non-meaningful auditory stimuli were applied (white noise, verbal and musical tasks, foreign language) and a right/left index was computed.

Performance of the verbal task provoked an asymmetric reduction in power, particularly in the alpha band, in the normal subjects and non-aphasic patients with left brain lesions, indicating a prevalent left hemisphere involvement. The absence of this trend was observed in the patients with language disorders.

- 3. Paroxysmal EEG abnormalities genetically transmitted - one family description.** - R. Silvestri, R. Ciliberto, N. Lombardo, P. De Domenico, G. Longo, W. Cavallari and R. Di Perri (Depts. of Neurology and Pediatrics, Messina)

A 10-year-old girl came to our observation since an EEG had shown, in the absence of any clinical manifestation, generalized and symmetrical 3 c/sec spike and wave bursts, whose duration was longer than 3 sec. The subject, the only daughter born of the first marriage of her mother, had no family history of neurological diseases; her physical and neuropsychological examinations were within normal limits. Polysomnographic recording showed, during SWS, the same abnormalities observed during wakefulness, while, during REM sleep, EEG activity was characterized by frequent diffuse polyspike and wave complexes, prominent in the anterior leads. Also on this occasion there were no related clinical manifestations.

Subsequent recordings were performed on her 33-year-old mother and 2 siblings, 3 and 2 years old respectively, born of the mother's second marriage, all normal by physical and neuropsychological examinations. Among them, only the 3-year-old sister showed asymptomatic left rolandic spikes.

The possible genetic transmission of paroxysmal EEG abnormalities is discussed.