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Assessing Acute Middle Cerebral Artery Ischemic
Stroke by Quantitative Electric Tomography
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ABSTRACT

This paper focuses on the application of quantitative electric tomography (qEEGT) to map changes in EEG generators for detection of early signs of ischemia in patients with acute middle cerebral artery stroke.

Thirty-two patients were studied with the diagnosis of acute ischemic stroke of the left middle cerebral artery territory, within the first 24 hours of their clinical evolution. Variable Resolution Electrical Tomography was used for estimating EEG source generators. High resolution source Z-spectra and 3- dimensional images of Z values for all the sources at each frequency were obtained for all cases. To estimate statistically significant increments and decrements of brain electric activity within the frequency spectra, the t-Student vs. Zero test was performed.

A significant increment of delta activity was observed on the affected vascular territory, and a more extensive increment of theta activity was detected. A significant alpha decrement was found in the parieto-occipital region of the affected cerebral hemisphere (left), and in the medial and posterior region of the right hemisphere.

These findings suggest that qEEGT Z delta images are probably related to the main ischemic core within the affected arterial territory; penumbra, diaschisis, edema, might explain those observed theta and alpha abnormalities. It was concluded that qEEGT is useful for the detection of early signs of ischemia in acute ischemic stroke.

Visual Assessment of Selected High Amplitude
Frontopolar Slow Waves of Sleep: Differences
Between Healthy Subjects and Apnea Patients
Sari-Leena Himanen, Atte Joutsen and Jussi Virkkala

ABSTRACT

Slow wave sequences with individually defined amplitude criterion were selected manually from frontopolar sleep EEG of eight healthy control subjects and eight patients with sleep apnea syndrome. Healthy subjects had clearly more time occupied by slow wave sequences in all night sleep. Closer examination revealed that the difference in the amount of slow wave sequence time between the groups was statistically significant only in the first NREM sleep episode. In other words, healthy subjects had more time with slow wave sequences in the first NREM sleep episode, where sleep pressure is supposed to be highest. The lower amount of slow wave sequences in the apnea patients might reflect the fragmented sleep of the patients, inhibiting cortical synchronization.

Attentional Distraction of CNV

Depending on the Spatial Focus

Tomiharu Hiruma, Yasuharu Sato, Hirooki Yabe, Naoko Shinozaki,

Takeyuki Sutoh, Takashi Matuoka, Tadayoshi Nashida, Ren Asai and Sunao Kaneko

ABSTRACT

To investigate the distraction of spatial attention to the task-irrelevant visual stimuli, contingent negative variation (CNV) was measured by using a forewarned reaction time task in 20 healthy subjects. The lasting emission of light, irrelevant to the CNV task, at each perimetric angle of 15°, 30° or 45° to the fixated point was presented to the subjects. The amplitude of early CNV was small only under the light-emission at the angle of 30°. Our results indicate that attention is distracted even by the lasting, task-irrelevant stimuli and that distraction is dependent on the focusing function of attention.

Correlation Between P300 and

EEG Rhythm in Schizophrenia

Eiji Kirino

ABSTRACT

We hypothesized that cognitive deficits reflected by P300 abnormality and distorted EEG rhythm in schizophrenia, which might share the subcortical generation system, could be closely associated with each other. Our goal is to assess the relationship between P300 and EEG rhythm generation in schizophrenics.

Quantitative EEG (QEEG) in resting condition and P300 during auditory oddball paradigm were recorded with 25 unmedicated patients. Additionally, lateral ventricular-brain ratio (LV-BR), which partially reflects thalamic volume, was measured using CT scan. Brief Psychotic Rating Scale (BPRS) and Scale for Assessment of Negative Symptoms (SANS) were also rated.

P300 amplitudes at Pz positively correlated with theta and slow alpha power before pharmacotherapy, however, the correlation tended to be confined to fast alpha after pharmacotherapy. BPRS and SANS showed no significant correlation with QEEG. High frequency bands such as fast alpha and beta showed trends to correlate negatively to LV-BR.

The lack of correlation between P300 amplitudes and fast alpha power before pharmacotherapy, which was restored after pharmacotherapy, might indicate thalamocortical dysfunction in schizophrenia.

The Relationship Between Bilateral

Spike and Wave Complexes and Focal

Discharges in Patients with Partial Epilepsy

John R. Hughes and John J. Fino

ABSTRACT

The goal of this study was to investigate in patients with partial epilepsy the relationship between bilateral spike and wave (BSW) complexes of a generalized epilepsy and the focal spikes of partial epilepsy. For the study 300 patients were collected, all with focal epilepsy on their last hospital visit: 150 were well controlled (C) and 150 were uncontrolled (U), and the number of EEGs was 674 in the C and 804 in the U groups. BSW were seen at some time in 25% of all patients, more often in the U than C patients, especially the irregular 3/sec form. The bilateral complexes at

times appeared at the onset of the epilepsy, usually at the same time with focal discharges, mainly from temporal or frontal areas. The U patients showed these complexes at a younger age than the C group and continued to be seen often into the 30s, occasionally into the 60s age group. The other presentation of the BSW was years after the onset of the focal discharges, usually temporal or frontal in location and more often seen in the U than C group. The U group showed spikes, many in number as active foci, more often than the C group. The discussion deals with the possibility that these bilateral spike and wave complexes may represent a reflection of a lowered threshold to a seizure.

Generalized Spike-Wave Discharges with Focal Onset in
a Patient with Head Trauma and Diffuse Cerebral Lesions:
A Case Report with EEG and Cranial MRI Findings
F. Irsel Tezer, Nese Dericioglu and Serap Saygi

ABSTRACT

The role of cerebral lesions associated with absence seizures, outside the frontal lobe, has not been demonstrated by both electroencephalography and neuroimaging techniques until now, to our knowledge. We present a case with absence seizures and EEGs with generalized 3 Hz spike-wave patterns that were preceded by a burst of spike-waves on the right parieto-occipital region. The patient had a history of head trauma, and cranial MRI revealed lesions that might be responsible for the seizures. The patient's lateralized and localized EEG findings were probably a representation of secondary bilateral synchrony (SBS). The mechanism of SBS is considerably more complex than a simple triggering of generalized spike-wave complexes from a single cortical focus.

Factors in the Interictal Record
Predicting an Ictal Episode: A Case Study
John R. Hughes, John J. Fino, Ketan Patel and William Domarad

ABSTRACT

This report deals with a patient with intractable seizures, who had 64 subdural electrodes implanted onto the left frontal and temporal cerebral cortex in anticipation of probable seizure surgery. One specific region on the left frontal lobe proved to be the focus for both the interictal spikes and also for the ictal activity. Our goal was to determine what electrical characteristics in the interictal record predicted the ictal episodes. The number of interictal spikes and also the amount of fast activity (15-128/sec) progressively increased before each of the 5 ictal episodes; an analysis showed that the number of spikes and their frequency proved the more significant variable. One other characteristic that changed before the ictal episodes was a great decrease in the interval between spikes as an example of a diminishing variability or increasing periodicity. Thus, the important factors in the interictal record that lead to an ictal event are the number of spikes, the amount of fast activity and the decreasing variability between the spikes.

A Case of Mild Alzheimer's Disease
Accompanied by Periodic Synchronous Discharges
Hiroyasu Ishikawa, Atsushi Sekine, Takashi Kanbayashi and Tetsuo Shimizu

ABSTRACT

Periodic synchronous discharges (PSD) on the electroencephalogram can be observed in diseases such as Creutzfeldt-Jakob disease, hypoxic encephalopathy and Alzheimer's disease (AD). However, in previously reported cases of AD with PSD, PSD have only been found many years after the diagnosis of AD. We recently encountered a patient with mild AD accompanied by transient PSD. To our knowledge, this is the first case report to suggest that PSD can occur in mild AD.