

Abstracts

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The Utility of EEG and Neurophysiologic Techniques After Neurotoxic Exposure

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There are over 70,000 different synthetic toxic chemicals in air, water and soil. The chemical industry is constantly manufacturing newer chemical substances. The central nervous system as well as the peripheral nervous system serve as sensitive bioindicators of potential chemical toxicity exposure in humans. This is certainly recognized in acute exposures, and only recently has been considered in chronic long-term low dose exposure to toxic chemicals. There are several widespread well known chlorinated hydrocarbon insecticides (CHI) which have been identified as long-term ecological and physiological contaminants in the environment. These substances are concentrated over time in human adipose tissue because of their lipophilicity. Chronic accumulation of these CHI in birds and animals interferes with reproduction efficacy, impairs metabolic function and has well documented neurologic effects. Their effects are thought to be secondary to impairment of $\text{Na}^{++}\text{-K}^{++}$ ATPase and blocking of chloride conductance channels. In man these CHI have not been studied intensively, especially after low dose chronic exposure, although CHI are known to cause seizures in acute overdoses.

Since CNS dysfunction may manifest as bioelectrical disturbance, it seems reasonable to consider employing the electroencephalogram, as well as cortical evoked responses and more

specifically quantitative neurophysiologic techniques, as indicators of abnormal physiologic state. The EEG serves as a useful noninvasive diagnostic test for evaluation of patients allegedly exposed to CHI. The EEG may show abnormalities consisting of bilateral synchronous theta wave activity and bilateral synchronous spike and wave complexes interictally. An excess of slow waves, spike activity and paroxysmal bursts of delta waves have also been seen after chronic exposure to higher levels of CHI. The common clinical end state after acute CHI has been well documented to consist of intractable seizure activity and frequently status epilepticus and death.

In thinking of neurointoxication from toxic chemicals such as CHI, neurologists need to be concerned about the full range of toxification, all the way from zero values through population averages, organ dysfunction and development of clinical symptomatology. During this theoretical progress from normal to abnormal neurological state, CNS damage may be occurring while the patient is asymptomatic or having an unusual constellation of nonspecific symptoms which do not fit neatly into any diagnostic categories. It behooves the clinical neurologist-electroencephalographer to consider toxic exposure in appropriate patients and to obtain an EEG in order to better evaluate the patient.

The Anterior Temporal Electrode Revisited

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The anterior temporal (AT) region of the brain is the most frequent location for a spike focus.

Occasional slow activities in the AT in elderly adults have been considered to be non-