

ICTAL FEAR: A PREDICTOR OF SURGICAL OUTCOME

Ictal Fear in Temporal Lobe Epilepsy: Surgical Outcome and Focal Hippocampal Changes Revealed by Proton Magnetic Resonance Spectroscopy Imaging

Feichtinger M, Pauli E, Schafer I, Eberhardt KW, Tomandl B, Huk J, Stefan H

Arch Neurol 2001;58:771-777

BACKGROUND: Ictal fear (IF) is most frequently associated with epileptic discharges from mesial temporal areas. **OBJECTIVES:** To determine whether patients with IF were more likely to become seizure free after antero-mesial temporal lobe resection compared with those without IF and whether they show more anteriorly pronounced metabolic changes assessed by means of multivoxel magnetic resonance spectroscopy (MRS) along the hippocampal axis. **METHODS:** Surgical outcome was assessed in 33 consecutive patients with temporal lobe epilepsy after a mean follow-up of 25 months (range, 12-38 months). Proton multivoxel MRS of the hippocampal formation was applied to detect regional differences along the axis of the hippocampus in patients with and without IF. Magnetic resonance tomography showed typical features of hippocampal sclerosis in all patients. **RESULTS:** Twelve (36%) of the 33 patients reported fear at the beginning of their habitual seizures. Eleven of these patients were seizure free postoperatively. In contrast, only 11 of 21 patients without IF had a favorable outcome. Results of MRS revealed significantly higher pathologic N-acetylaspartate-choline ratios in the anterior portion of the hippocampal formation in patients with than in those without IF, indicating focal metabolic and/or morphologic changes in the head of the hippocampus. **CONCLUSIONS:** These results indicate the importance of diagnosing auras with IF to provide a more detailed prognosis of the surgical outcome. In addition, our data emphasize that multivoxel MRS is a valuable tool in the presurgical evaluation, as it may reveal different topographical patterns of hippocampal sclerosis.

COMMENTARY

The mesial temporal lobe structures, especially the amygdala, are critical in the mediation of fearful emotions. Electrical stimulation of the amygdala, and to a lesser degree the hippocampus or parahippocampus, can produce the feeling of fear. In addition, fear is one of the well known experiential phenomena associated with temporal lobe seizures. Ictal fear is the sudden, often brief, fearful affect at the beginning or during an epileptic seizure, which occurs without context or relation to preceding perceptions. Atrophy of the amygdala and hippocampus have been related to the presence of ictal fear in temporal lobe epilepsy (TLE).

Feichtinger et al. examined the relationship of preoperative ictal fear to seizure outcome following temporal lobectomy and to the spatial distribution of metabolic abnormalities in the mesial temporal lobe as evidenced by magnetic resonance spectroscopy (MRS). They found that 92% of TLE patients with ictal fear became seizure-free as compared to 52% of TLE patients without ictal fear. In addition, they report that MRS abnormalities were more prominent in the anterior portion of the mesial temporal lobe for patients with ictal fear compared to those without ictal fear.

A reduced ratio of N-acetylaspartate (NAA) to choline (Cho) or creatine (Cr) is indicative of neuronal loss or dysfunction. Unilateral reductions in NAA/Cho have been shown to assist the preoperative localization of the epileptic focus in TLE. Although controversial, some studies have suggested that focal sclerosis in the head of the hippocampus is associated with a better postoperative outcome following temporal lobectomy compared to a diffuse anterior and posterior pattern of sclerosis in TLE. Thus, the prognostic value of ictal fear may be related to its association with focal anterior mesial temporal lobe MRS abnormalities. Prior studies have not found that any type of aura was prognostic of postoperative seizure outcome. The predominance of other auras or of anterograde amnesia may reduce subjective awareness of fear in some patients. It is possible that the direct and systematic questioning of patients employed in the present study is required to maximize the detection of ictal fear and uncover its association with seizure outcome. Alternatively, the relative small sample size in the present study may have produced subject selection bias, so additional studies with a higher number of patients are needed to confirm the present observation.

by Kimford J. Meador, M.D.