

DO FEBRILE SEIZURES CAUSE MESIAL TEMPORAL SCLEROSIS?

Febrile Seizures and Mesial Temporal Sclerosis: No Association In A Long-Term Follow-Up Study

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OBJECTIVE: To determine whether febrile seizures cause mesial temporal sclerosis (MTS), the occurrence of MTS was evaluated in an unselected series of patients with febrile seizures.

METHODS: Twenty-four patients with a prolonged first febrile seizure, 8 with an unprovoked seizure after the first febrile seizure, and 32 age-, sex-, and handedness-matched control subjects with a single simple febrile seizure without later unprovoked seizures were selected from 329 febrile seizure patients followed up prospectively. The occurrence of MTS was evaluated after a mean follow-up time of 12.3 years by MR volumetry of amygdala and hippocampal formation and qualitative analysis of mesial temporal structures.

RESULTS: None of the patients had MTS. The mean total volumes of the right and left hippocampal formations and amygdala did not differ significantly between any of the three groups. The qualitative analysis revealed no sclerotic changes in the mesial temporal area. The patients with a prolonged initial febrile seizure had a lower mean right–left volume difference in hippocampal formations than the control subjects, but this had no effect on the outcome.

CONCLUSION: The occurrence of MTS following even prolonged febrile seizures is an uncommon event, confirming the good clinical outcome of febrile seizures.

(1–4). Moreover, rapid development of abnormalities seen on MRI suggesting MTS has been reported after febrile status epilepticus in infants (5). Animal models support the association as well. For instance, immature rats exposed to hyperthermic seizures during infancy develop significantly reduced hippocampal seizure thresholds to chemical convulsants and electrical stimulation during adult life (6). Other investigators, however, have not detected an association of febrile seizures with hippocampal formation atrophy (7,8,9,10), and epidemiological studies suggest that the overall risk of developing later epilepsy after febrile seizures is small (7,10,11,12).

In a new study, Tarkka et al., evaluated 32 children, 12–14 years old, with a history of prolonged (≥ 30 minutes) first febrile seizure. Eight of the 32 children had had an unprovoked seizure after the first febrile seizure. In addition, 32 age- and sex-matched controls, who had had a single simple febrile seizure but no subsequent unprovoked seizures, were evaluated. The authors found no evidence of increased signal on MRI, using T₂-weighted axial images, or any differences in hippocampus or amygdala volumes among patients with a prolonged initial febrile seizure, an unprovoked seizure after the initial febrile seizure, or a single simple febrile seizure. Patients with later unprovoked seizures had no difference in mean right–left hippocampal volume asymmetry compared to those with a single simple febrile seizure. Three patients in the prolonged febrile seizure group did have a smaller right hippocampal formation.

This relatively small study found no evidence for a link between febrile seizures and MTS. The patients represented a general clinic population, rather than surgical candidates with uncontrolled temporal lobe epilepsy—only three of the eight with afebrile seizures had had complex partial seizures. The results suggest that febrile seizures alone may not increase the risk of MTS and that other factors, such as uncontrolled seizures themselves, or possibly an underlying malformation, may play a role (5,13).

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COMMENTARY

Several studies have related a history of febrile seizures, particularly complex febrile seizures, to the presence of mesial temporal sclerosis (MTS) in patients with temporal lobe epilepsy, as identified on magnetic resonance imaging (MRI)

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