Selected Summaries

Risk of Unprovoked Epilepsy After Febrile Convulsions

[Maker J, McLachlan RS. Febrile convulsions: Is seizure duration the most important predictor of temporal lobe epilepsy? Brain 1995,118: 1521-1528.]

In an attempt to establish an association between febrile seizures in past and occurrence of non-febrile epilepsy later, the authors studied six families each with multiple members (at least 4 per family) who were affected by febrile convulsions. All six probands developed epilepsy subsequent to occurrence of febrile convulsions. One of the proband had hemiconvulsion-hemiplegia-epilepsy (HHE) syndrome. Clinical characteristics of febrile convulsions: age at onset, total number of febrile convulsions, maximum number of febrile convulsions in any one day, duration of the longest febrile convulsion, occurrence of partial febrile seizure, associated afebrile seizure, and any associated neurological or mental abnormalities, were compared in between family members who did or did not develop afebrile seizure in later life. Electroencephalographic (EEG) studies were performed in 27 patients with history of febrile convulsions and 21 normal family members. Five of the eight patients with temporal lobe epilepsy underwent temporal lobectomy.

Sixty nine family members had seizures, 59 of whom had febrile convulsions. Eight (13%) family members out of 59 patients with febrile convulsions developed temporal lobe epilepsy. Four (7%) had other seizure disorders. However, only one of the 213 family members with no febrile convulsions had temporal lobe epilepsy. It took on average 12 ± 12.5 years for temporal lobe epilepsy to occur after first febrile seizure. Fifty three (90%) patients with febrile seizures' were fully assessed. In this group mean duration of febrile convulsions was significantly higher in those with (100 ± 133 min) or without (9 ± 19 min) subsequent development of temporal lobe epilepsy. Other factors did not differ significantly between the groups.

Eleven out of 27 patients with febrile convulsions had epileptiform activity in EEG while in all 21 family members without febrile seizures EEGs were normal. All eight patients with temporal lobe epilepsy and febrile convulsion had focal temporal lobe epileptiform activity. Histopathology in 5 of these patients, in whom temporal lobectomies were performed, revealed mesial temporal sclerosis in all. In another two patients who did not have surgery, magnetic resonance imaging (MRI) showed hippocampal atrophy suggestive of mesial temporal sclerosis.

In conclusion, authors reported a strong relationship between febrile convulsions and subsequent unprovoked seizures, especially temporal lobe epilepsy consequent to mesial temporal sclerosis. They noted that the long duration of febrile convulsion is the most important determinant of this association.

Comments

Febrile convulsions occur in young children who have an individual susceptibility to convulse in a setting of acute fever. The prevalence of these seizures is about 3% in the population at risk. They are rare below 6 months and above 5 years of age. The typical febrile convulsion is usually brief and generalized tonic-clonic in nature(l).

Prognosis for children who suffer from febrile convulsion is a cause of concern for parents. Serious and wide spread neurological damage may follow a prolonged episode of seizures as in the HHE syndrome. This study also reported two patients of HHE syndrome.

However, the precise relationship between febrile convulsion and temporal lobe epilepsy remains debatable. Annegers *et al.*{2) evaluated the risk of unprovoked seizures in 687 children with febrile convulsions and reported 5% rate of unprovoked seizures by 5 years of age and 7% rate by 25 years of age. Some studies do not support this association(3). In addition to prolonged febrile convulsions especially when lateralized, repeated convulsions in some illness, onset before 1 year, antecedent cerebral injury, associated mental handicap, female sex and family history of epilepsy of genetic origin in first degree relatives are some factors which are associated with development of later epilepsy, frequently temporal lobe epilepsy(l,4). In this study the authors observed that duration of febrile convulsion was the most important factor associated with etiopathogenesis of temporal lobe epilepsy. Prolonged seizures which lasted on an average 100 min each were significantly more common in those who developed temporal epilepsy while febrile convulsions in family members who did not develop epilepsy were less than 30 minutes in duration. Both patients with HHE syndrome had prolonged febrile convulsion averaging 120 minutes. Annegers *et al.*(2) observed that two thirds of those who had unprovoked seizures had more than a single attack and thus suffered from epilepsy. Increasing numbers of febrile seizures, age at onset less than 1 year and focal and prolonged (>30 min) febrile convulsions were important predictive factors. When the factors related to the development of partial epilepsy have been looked at separately from those present in generalized epilepsy, it has been found that persisting generalized tonic-clonic seizures occurred significantly more often in children of unskilled parents, where there had been adverse perinatal events and persistent neurological-abnormalities where the complex partial seizures occurred significantly more often when the first febrile convulsion had been prolonged and partial(5). In this series, four patients of febrile convulsion group had other than temporal lobe epilepsy.

EEG is not the investigation of choice considering structural pathology as sequelae to febrile seizures. Computed tomography (CT) and magnetic resonance imaging would be more appropriate. However, EEG still can be a useful ancillary investigation capable of suggesting persistent brain pathology (even when CT scans are reported normal) if it demonstrates an abnormality which is persistent. So, serial EEG recordings are more useful rather than a single record(6). In the present series also, the authors observed EEG abnormalities in febrile convulsion group only.

An association between febrile seizures and hippocampal sclerosis has been noted, but the precise reason of brain damage is not known. Previous studies have been restricted to histopathological examination of necropsy material. Volumetric MRI study *in vivo* may be an accurate method for measuring the volume of the hippocampus and thus detecting the underlying pathology of temporal lobe seizures (7). In this study, MRI in two of three patients who did not have surgery revealed hippocampal increased signal and atrophy suggestive of mesial temporal sclerosis.

So, authors have convincingly confirmed that prolonged febrile seizures remained the most important risk factor for unprovoked epilepsy in later life; temporal lobe epilepsy being the commonest type of epilepsy. Authors further demonstrated that it might be difficult to treat this type of epilepsy and few patients may require 'epilepsy surgery' at some stage of their lives. It is of utmost importance to prevent the brain damage by timely and effective treatment of febrile convulsions. Educating parents and treating physicians about the need for early management is desirable in this context.

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NOTES AND NEWS

WORKSHOP ON TUBERCULOSIS IN CHILDREN

This workshop is being organized by Indian Academy of Pediatrics, West Bengal Branch on July 28th, 1996 at Institute of Child Health, Calcutta. For further details please contact: Dr. Tapan Kr. Ghosh, Secretary, IAP Room, IMA House, 53, Creek Row, Calcutta 700 014.

ERRATUM

In the article entitled 'Calcium gluconate-Its unusual complication' by J.K. Lakhani published in the June 1996 issue on pages 510 and 511, the figures 1 and 2 have been interchanged.

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