# PEDIATRIC NEUROLOGY BRIEFS A MONTHLY JOURNAL REVIEW

## J. GORDON MILLICHAP, M.D., F.R.C.P., EDITOR

Vol. 16, No. 6

June 2002

## SEIZURE DISORDERS

### RISK AND CAUSE OF DEATH IN EPILEPSY

The risk factors and frequency of death in childhood epilepsy were assessed in a population-based cohort study at Dalhousie University, Halifax, Nova Scotia, Canada. Of 692 children who developed epilepsy during 1977-85, 26 (3.8%) had died by 1999. Frequency of death was 5.3 times higher than in the reference population in the 1980s and 8.8 times higher in the 1990s. The mortality at 20 years after onset was 6.1% compared to 0.88% in the reference population matched for age and sex. Onset of seizures in the first year carried a significantly increased risk of mortality compared to later onset epilepsy. Of 85 children with secondary generalized epilepsy, 15% died, compared to 2% of 510 with partial and primary generalized epilepsy, and 1% of 97 with absence epilepsy. Severe disorders associated with functional neurological deficit were associated with 22 times greater risk of death and were the cause of death in 22 children at a mean age of 10 years (range 1-29), independent of sex, age, and epilepsy type. Aspiration with pneumonia was the cause of death in 14, infection in 3, shunt malfunction 1, pulmonary embolism 1, congestive heart failure 1, gastroesophageal reflux 1, and status epilepticus in 1. The rate of death in patients without severe neurological deficit was 0.8% (of 591), similar to that in the reference population. Four deaths were unexpected, all in young adults, aged 18-30 years, without severe neurological deficits. Suicide was the cause in 2, homicide in 1, and a sudden unexpected death, unexplained at autopsy, in a 21-year-old woman with tuberous sclerosis who had several seizures during sleep. Functional neurological deficit was the only independent determinant of mortality. (Camfield CS, Camfield PR, Veugelers PJ. Death in children with epilepsy: a population-based study. Lancet June 1, 2002;359:1891-1895). (Respond: Dr Carol Camfield, Division of Child Neurology, IWK Health Centre, Halifax, Nova Scotia B31 3G9. Canada).

COMMENT. Children with epilepsy have more than five times the risk of dying in the first 20 years after onset. Most deaths are related to comorbid severe neurological disorders associated with functional neurological deficit and not to the epilepsy per se. Camfield and associates have demonstrated that death from

PEDIATRIC NEUROLOGY BRIEFS (ISSN 1043-3155) © 2002 covers selected articles from the world literature and is published monthly. Send subscription requests (S63 US; S65 Canada; \$73 airmail outside N America) to Pediatric Neurology Briefs - J. Gordon Millichap, M.D., F.R.C.P.-Editor, P.O. Box 11391, Chicago, Illinois, 60611, USA.

The editor is Pediatric Neurologist at Children's Memorial Hospital and Northwestern University Medical School, Chicago, Illinois, PNB is a continuing education service designed to expedite and facilitate review of current scientific information for physicians and other health professionals. Fax: 312-943-0123. seizures themselves is uncommon, a finding that should help to allay the fear often expressed by parents of a child with a first convulsion.

Camfields' findings are similar to those of Callenbach PMC et al who reported a mortality rate of 3.8/1000 person-years, seven times higher than expected in a cohort of 472 children in the Netherlands. None of 328 children with nonsymptomatic epilepsy died. In those with symptomatic epilepsy, the mortality risk was 22.9 vs 0.39 expected in a control population (<u>Pediatrics</u> 2001;107:1259-1263; see <u>Ped Neur Briefs</u> June 2001;15:43-44). Among the 9 deaths in this prospective study, none was sudden unexpected and unexplained (SUDEP). SUDEP risk factors are usually multiple and include early-onset epilepsy, poor seizure control, polytherapy with antiepileptic drugs (AED), and frequent dose adjustments or abrupt AED withdrawal (Nilsson et al. In Gordon N. <u>Dev Med Child</u> Neurol 2001;43:354-357).

An accurate initial diagnosis is important in counseling parents regarding risk of mortality in childhood epilepsy. Children with secondarily generalized epilepsy associated with functional neurological deficit are particularly at risk of a poor prognosis. Apart from the rare exception of SUDEP in children with tuberous sclerosis, deaths in epilepsy are usually explained.

#### FOCAL CORTICAL HYPOMETABOLISM AND INFANTILE SPASMS

The occurrence and prognostic significance of focal defects in cerebral cortical glucose metabolism were evaluated in infants with newly diagnosed symptomatic and cryptogenic infantile spasms examined at Turku and Helsinki Universities, Finland, MRI, video-EEG, and PET were obtained within 2 weeks of diagnosis in 10 patients with symptomatic and 7 with cryptogenic infantile spasms. Twelve patients had repeat PET at 1 year of age. Cortical hypometabolic foci occurred in 13 (77%) infants: 7 had symptomatic and 6 cryptogenic spasms. In 7 of 9 reexamined with PET at age 1, foci had disappeared, and none of 6 with occipital foci had persistent hypometabolism. The focal PET abnormalities correlated with focal findings on video-EEG. Quantitative cortical and subcortical glucose metabolic rates were similar in cryptogenic and symptomatic spasms at onset. Striatal values are higher than cortical values in all patients. Focal lesions in glucose metabolism associated with infantile spasms have no prognostic value for seizure outcome. (Metsahonkala L, Gaily E, Rantala H et al. Focal and global cortical hypometabolism in patients with newly diagnosed infantile spasms. Neurology, June (1 of 2) 2002;58:1646-1651). (Reprints: Dr L Metsahonkala, Department of Pediatrics, Turku University Central Hospital, PL52 20521 Turku, Finland).

COMMENT. Cortical hypometabolic lesions demonstrated by PET in children with infantile spasms are usually transient, especially those in occipital regions, the most common localization. They are equally common in cryptogenic and symptomatic spasms. PET and video-EEG abnormalities are correlated, but PET is the better test to detect focal cortical dysfunction. PET is of no value in prognosis, whereas infants with MRI structural abnormalities are at increased risk of continuing seizures and poor developmental outcome. Most children with infantile spasms and favorable outcome have transient foci of cortical hypometabolism at onset, especially occipital in location.

Bitemporal glucose hypometabolism may be indicative of a poor prognosis, delayed development, severe dysphasia, and autism in children with infantile spasms examined by PET. (Chugani HT et al. 1996; see <u>Progress in</u> <u>Pediatric Neurology III</u>, PNB Publ, 1997;pp40-41).