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SEIZURE DISORDERS

LONG-TERM MORTALITY IN CHILDHOOD-ONSET EPILEPSY

Seizure outcomes and mortality in a Finnish population-based cohort of 245 children diagnosed with epilepsy in 1964 were prospectively followed for 40 years (range, 2 to 53) at the Departments of Pediatric Neurology and Public Health, Turku University Hospital, Finland, and the Comprehensive Epilepsy Management Center, Montefiore Medical Center, Bronx, NY. Mortality overall was 24%, a rate 3 times that expected in the general population and 6.9 per 1000 person-years. The rate of death among subjects with incident cases of epilepsy was 5.3 per 1000 person-years and not significantly different from the 9.6 per 1000 among prevalent cases. Of 60 subjects who died, 51 had seizures during the 5-year period up to time of death or last 5-year follow-up. In addition to seizure recurrence in the terminal 5 years, increased risk of death was associated with a remote symptomatic cause of epilepsy, noted in 37% cases compared to 12% of those with an idiopathic or cryptogenic cause ($P<0.001$). Thirty-three (55%) of the 60 deaths were related to epilepsy, including sudden, unexplained death in 18 subjects (30%), seizure in 9 (15%), and accidental drowning in 6 (10%). Death was related to the underlying neurologic problem in 26 patients (43%) with remote symptomatic epilepsy, a death rate of 11.1 per 1000 person years. The highest rate of death occurred among subjects not in 5-year terminal remission; only 4 deaths occurred in 103 subjects who were in remission and not on medication (1.5 per 1000 person-years), as compared to 5 deaths in 35 subjects who were in 5-year remission and receiving medication (11.8 per 1000) and 51 deaths in 107 subjects not in 5-year remission (15.9 per 1000) ($P<0.001$).
Of 18 cases of sudden unexplained death (15 confirmed at autopsy), 7 had idiopathic or cryptogenic epilepsy, and 11 had remote symptomatic epilepsy. The risk of sudden, unexplained death among all subjects with epilepsy was 7%, and 12 % among

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those who were not in 5-year terminal remission and not receiving medication; it was 5% among subjects with idiopathic or cryptogenic epilepsy, none younger than 14 years of age; 15% if not in 5-year terminal remission with no medication. Increased risk of death associated with childhood-onset epilepsy and persisting into adulthood is limited to subjects with unremitting seizures and those with another neurologic disability, particularly cognitive impairment. Absence of 5-year terminal remission from epilepsy was the only significant risk factor for sudden, unexplained death. (Sillanpaa M, Shinnar S. Long-term mortality in childhood-onset epilepsy. **N Engl J Med** Dec 23, 2010;363(26):2522-2529) (Response and reprints: Dr Shinnar, Comprehensive Epilepsy Management Center, Montefiore Medical Center, 111 E 210th St, Bronx, NY 10467. E-mail: sshinnar@montefiore.org).

COMMENT. SUDEP is usually associated with refractory epilepsy, and AED polytherapy and frequent dose changes, reported as possible causative factors (Tomson T et al, 2005), are probably a consequence of the recurrent seizures. Seizure-induced cardiac asystole, recorded in patients undergoing video-EEG monitoring, is associated with a risk of SUDEP. (Lanz M et al, 2010). Also, positional airway obstruction and hypoventilation in postictal coma is suspected in a patient with SUDEP after having a generalized seizure in the prone position. (Tao JX et al, 2010). SUDEP may share a similar etiology with SIDS, and may be preventable in some cases by attention to airway obstruction. Postictal shutdown of brain activity and respiratory arrest is another mechanism proposed. (Lhatoo SD et al, 2010). In cognitively delayed children with remote symptomatic epilepsy, seizures should be kept to a minimum, with avoidance of polytherapy when possible, and observance of seizure precautions related to swimming and sleeping.

ELECTROCLINICAL CASE-CONTROL STUDY OF SUDEP AND POSTICTAL BRAIN SHUTDOWN

Ten adult patients with 30 documented epileptic seizures during video-EEG recording and who later died of SUDEP were compared with 30 matched live controls with 92 epileptic seizures from the same video-telemetry database at Case Medical Center, Cleveland, OH, and Frenchay Hospital, Bristol, UK. Postictal generalized EEG suppression (PGES) was seen in 15/30 (50%) case and 35/92 (38%) control seizures. PGES was significantly longer in the generalized motor seizures of the SUDEP group ($P<0.001$). Odds of SUDEP occurring were elevated with PGES durations of >50 secs ($P<0.05$); the odds were quadrupled beyond 80 secs. For each 1 sec increase in duration of PGES, the odds of SUDEP increased by 1.7% ($P<0.005$). Refractory epilepsy patients at risk of SUDEP have prolonged PGES (>50 secs), and risk of SUDEP is correlated with duration of PGES. The authors propose that a profound postictal cerebral dysfunction leading to central apnea may be a pathogenic mechanism for SUDEP. (Lhatoo SD, Faulkner HJ, Dembny K, Trippick K, Johnson C, Bird JM. An electroclinical case-control study of sudden unexpected death in epilepsy. **Ann Neurol** Dec 2010;68:787-796). (Respond: Dr Lhatoo, University Hospitals, Case Medical Center, Department of Neurology, 11100 Euclid Ave, Cleveland, OH 41106. E-mail: slhatoo@aol.com).