

PEDIATRIC NEUROLOGY BRIEFS

A MONTHLY JOURNAL REVIEW

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

Vol. 26, No. 7

July 2012

SLEEP-RELATED DISORDERS

THALAMUS & ELECTRICAL STATUS EPILEPTICUS IN SLEEP

Researchers at Children's Hospital, Boston, MA, and other centers in the US; Winnipeg, Canada; and Barcelona, Spain compared the prevalence during a 14-year period and the type of early developmental lesions in 147 patients with electrical status epilepticus in sleep (ESES), 100 with prominent sleep-potentiated epileptiform activity (PSPEA) and 47 patients without PSPEA as controls. Mean age at EEG recording was 7.9 years. All patients had at least one MRI. Early developmental lesions, chiefly thalamic, were more frequent in cases with PSPEA than in controls (48% vs 19.2%, $p=0.002$). Thalamic, mainly vascular, lesions occurred in 14% cases vs 2.1% in controls ($p=0.037$). Early developmental lesions were 14% vascular, 9% periventricular leukomalacia, and 5% cortical malformations. Clinical features of 100 patients with non-REM-PSPEA included developmental regression (50%), language regression (43%), clinical seizures (78%), cerebral palsy (22%), autistic behavior (20%), and attention deficit (7%). (Sanchez-Fernandez I, Takcoka M, Tas E, et al. Early thalamic lesions in patients with sleep-potentiated epileptiform activity. *Neurology* 2012 May 29;78(22):1721-1727). (Response and Reprints: Dr Loddenkemper. E-mail: tobias.loddenkemper@childrens.harvard.edu).

COMMENT. Almost 50% of children with epilepsy and PSPEA have early developmental lesions, especially vascular and thalamic in origin. In patients with language regression, behavioral changes, and epilepsy accompanied by sleep-potentiated EEG abnormalities, the search for thalamic dysfunction may prove to be a helpful anatomic correlate. (Quigg M, Noachtar S. Editorial. *Neurology* 2012 May 29;78(22):1708-1709). An MRI should be considered in children with PSPEA.

Electrical status epilepticus during sleep is found in 50% of patients with acquired epileptic aphasia (Landau-Kleffner syndrome) (Hughes JR, *Epilepsy Behav* 2011

PEDIATRIC NEUROLOGY BRIEFS © 1987-2012, ISSN 1043-3155 (print) 2166-6482 (online), is published monthly and covers selected articles from the world literature. The editor is Pediatric Neurologist at the Ann & Robert H. Lurie Children's Hospital of Chicago; Professor Emeritus, Northwestern University Feinberg School of Medicine. PNB is a continuing education service designed to expedite and facilitate the review of current scientific information for physicians and other health professionals. Apply to PediatricNeurologyBriefs.com for Subscriptions (12 issues, January - December 2012): Digital PDF, \$72 (Residents/Fellows \$36); Print + Digital, \$96 within US & UK; \$128 outside US & UK. Institutional rates are available. To order by mail: Pediatric Neurology Briefs Publishers, PO Box 11391, Chicago, IL 60611

Feb;20(2):247-253), and language regression occurs in 43% of the patients with sleep-potentiated epileptic activity in the EEG. (Sanchez-Fernandez I. et al. *Neurology* 2012 May 29;78(22):1721-1727). The present article links acquired epileptic aphasia with sleep-potentiated epileptic activity in the EEG and MRI findings of early thalamic injury. The thalamus has a role not only in the facilitation of seizure activity during non-REM sleep but also in sleep-related electrical status epilepticus and associated language and behavioral regression.

THERAPY OF ENCEPHALOPATHY WITH ESES/CSWS

Researchers at University of Pavia, Italy review treatment options for electrical status epilepticus in sleep (ESES)/continuous spikes and waves during slow sleep (CSWS) and their comparative value. ESES/CSWS is an age-related, self-limiting disorder characterized by epilepsy with various seizure types, neuropsychological regression, and a typical EEG pattern of continuous epileptiform activity for more than 85% of non-rapid eye movement (non-REM) sleep. ESES/CSWS is rare, accounting for 0.2-0.5% of childhood epilepsies. The goal of treatment is not only to control clinical seizures but also to improve neuropsychological functions and prevent potential cognitive deterioration. When the EEG pattern of ESES is refractory to AEDs, more aggressive therapeutic approaches are considered, but evidence of efficacy is dependent on uncontrolled studies and case reports. The authors' suggested approach to treatment begins with the AEDs valproic acid, benzodiazepines, or levetiracetam. If unresponsive after 6 months, the addition of steroids is applicable. Phenobarbital and carbamazepine should be avoided since these AEDs increase synchronous bilateral epileptic discharges in the EEG and worsen clinical manifestations. (Veggiotti P, Pera MC, Teutonico F, Brazzo D, Balottin U, Tassinari CA. Therapy of encephalopathy with status epilepticus during sleep (ESES/CSWS syndrome): an update. *Epileptic Disord* 2012 Mar;14(1):1-11). (Respond: Dr P Veggiotti, Istituto Neurologico C Mondino, Via Mondino 2, 27/100 Pavia, Italy. E-mail: pveggiot@unipv.it).

COMMENT. In this report, ESES and CSWS are considered synonymous but this opinion is sometimes debated. Cognitive impairment is a hallmark of the syndrome, either global or selective, involving language regression as in acquired epileptic aphasia (Roulet PE, Davidoff V, Despland PA, Deonna T. *Dev Med Child Neurol* 1993 Aug;35(8):661-674). The pathophysiological mechanisms of CSWS and associated neuropsychological deficits are poorly understood.

Investigators in Kiel, Germany compared the results of functional MRI in 12 children with CSWS to electric source analysis. Spike-related positive activations and negative deactivations involved bilateral perisylvian region and cingulate gyrus in all cases, frontal cortex in 5, parietal cortex in 1, and thalamus in 5 cases. Despite etiological heterogeneity, patients with CSWS were characterized by activation of the similar neuronal network: perisylvian region, insula and cingulate gyrus. The influence of epileptic spikes on neuronal networks important in the consolidation of memory traces during sleep may explain the association of CSWS with neuropsychological deficits. (Siniatchkin M, Groening K, Moehring J, et al. Neuronal networks in children with continuous spikes and waves during slow sleep. *Brain* 2010 Sep;133(9):2798-2813).