

(28%)(arteriovenous malformation in 11), congenital heart disease in 14 (16%), and brain tumor in 13 (15%). Infection was associated in 5 (6%) cases, and coagulation deficiencies in 4 (5%). (Wo WD et al. **Arch Neurol** 2008;65:1629-1633; **Ped Neur Briefs** 2009;23:16).

Of 251 patients with childhood stroke (aged 1 month through 16 years) admitted to Beijing Children's Hospital, China, 1996-2006, arterial ischemic stroke accounted for the majority of cases (62.5%) and hemorrhagic stroke for 37.5%. Vitamin K deficiency was a major etiology of hemorrhagic stroke in China, diagnosed in 72 (76.6%) of 94 cases, most occurring in breastfed infants who had received no vitamin K after birth. Cerebral vascular abnormality was present in 7 (7%) (AVM in 6 of these). Infection played a role in 10%, including viral encephalitis, varicella zoster, mycoplasma and Epstein-Barr virus infections.(Wang J-J et al. **Pediatr Neurol** 2009;40:277-281). Etiological factors associated with hemorrhagic stroke in China differ from those reported in Western countries, where AVM is the most frequent cause.

HEADACHE DISORDERS

MENSTRUAL MIGRAINE IN ADOLESCENTS

The relationship between migraines and the menstrual cycle in prepubertal and pubertal girls was analyzed retrospectively in 896 girls, aged 9 to 18 years (mean age 14.3 years), attending a pediatric Headache Center at the Cincinnati Children's Hospital, OH. At the initial evaluation, headaches had occurred with menstrual periods in 50.3% of menarchal girls and 36.9% of all girls in the cohort. Mean age of headache onset was 10.3 +/- 3.5 years, and mean age of initial presentation was 13.8 +/- 2.6 years. Of the total group, 830 (92.6%) reported headaches that met the ICHD-II criteria (migraine without aura in 80.4% and migraine with aura in 12.3%). Those not meeting ICHD-II criteria had 'probable migraine.' Average headache frequency was 17.2 +/- 10.7 per month and average severity was 6.5 on a scale of 0-10. Duration of headache was 12.3 +/- 19 hrs. Migraine with a menstrual pattern started between day -2 and +3 of the onset of the menstrual period (68% before and only 14% after the period started). Headache frequency, severity and duration were no different in girls with or without a menstrual pattern (p=0.10). Associated symptoms, including photophobia, nausea and vomiting, were increased in girls with menstrual migraine compared to those without (p<.01). A total of 160 had a monthly pattern to the headaches and potential menstrual related migraine before beginning menstruation. A progressive increase in prevalence of a monthly pattern of migraine was observed in adolescents who later developed menstrual related migraine. The prevalence plateaued at age 13 years in susceptible patients, coinciding with onset of the first period. Intermittent prophylaxis for adolescents with a predictable pattern of menstrual related migraine should be considered. (Crawford MJ, Lehman L, Slater S et al. Menstrual migraine in adolescents. **Headache** March 2009;49:341-347). (Respond: Andrew D Hershey MD, Children's Hospital Medical Center, Department of Neurology, 3333 Burnet Ave, MLC 2015, Cincinnati, OH 45229).

COMMENT. Menstrual migraine is defined as migraine without aura with 90% of attacks occurring between 2 days before and 3 days after onset of menstruation, in at least 2 out of 3 menstrual cycles. Falling levels of estrogen during the late luteal/early follicular phase of the menstrual cycle are a proposed mechanism for menstrual migraine.