of migraine, 85% met migraine diagnostic criteria of the International Headache Society, and 40% had chronic daily headaches. The PQLI score for the group (73.1 +/- 14.4) was lower than that for healthy norms (83.0 +/- 14.8) and was lowest for children with chronic daily headaches (70.5 +/- 15.5). The impairment of QOL in children with migraine was similar to that observed in children with arthritis and cancer, affecting school and emotional functioning. (Powers SW, Patton SR, Hommel KA, Hershey AD. Quality of life in childhood migraines: clinical impact and comparison to other chronic illnesses. Pediatrics July 2003;112:e1-e5). (Reprints: Scott W Powers PhD, Headache Center, Division of Psychology, Cincinnati Children's Hospital, MLC, D-3015, 3333 Burnet Ave, Cincinnati, OH 45229). E-mail:Scott.Powers@cchmc.org).

COMMENT. The prevalence of childhood migraine is estimated at about 11%, more than twice that reported in earlier studies. Environmental factors, including school, social, and family tensions, are cited as factors in the increased prevalence of migraine noted in the last decade. (see Progress in Pediatric Neurology III, PNB Publishers, 1997;pp187-190). A similar increase in migraine prevalence is noted in adult populations. With the increased consumption of snack foods, caffeine-containing beverages, and alcohol among children and adolescents, diet as a cause or precipitant of migraine is receiving increased attention (Millichap JG, Yee MM. Pediatr Neurol Jan 2003;28:9-15). Headaches, especially chronic daily headaches, cause a pattern of disability and impairment in quality of life similar to that in children with rheumatoid arthritis or cancer. Children with migraine report more impairment in school and emotional functioning than those with other chronic diseases.

DEGENERATIVE DISORDERS

NITROUS OXIDE TOXICITY WITH METHYLENETETRAHYDROFOLATE REDUCTASE DEFICIENCY

The neurological deterioration and death of a child with methylenetetrahydrofolate reductase (MTHFR) deficiency following anesthetization with nitrous oxide are reported from the University of Wisconsin Medical School, Madison, WI, and McGill University, Montreal. The child appeared normal until 3 months of age, when a mass in the left leg developed. The patient's father, an uncle, and a sibling had elevated levels of homocysteine, and received high-dose vitamin B supplements. Twenty five days after resection of an infantile fibrosarcoma under halothane and 60% nitrous oxide anesthesia, the patient was readmitted because of seizures and episodic apnea. He was severely hypotonic, and areflexic. CT of brain showed generalized cerebral atrophy. Urine was positive for homocystine, but negative for organic acids and methylmalonic acid. Plasma homocystine was elevated, methionine level was low, vitamin B_{12} level normal, serum folate low normal, and csf folate normal. The patient died at 130 days of age (46 days after operation) with respiratory arrest. Autopsy revealed cerebral atrophy and severe demyelination, with astrogliosis in the midbrain, medulla, and cerebellum. Values for MTHFR activity in cultured fibroblasts were low. The child and his affected relatives were heterogeneous for a novel mutation which causes substitution of isoleucine for methionine. The mutation was transmitted from a paternal chromosome. Nitrous oxide inactivates

methionine synthase and the enzyme inhibition is irreversible. (Selzer RR, Rosenblatt DS, Laxova R, Hogan K. Adverse effect of nitrous oxide in a child with 5,10-methylenetetrahydrofolate reductase deficiency. N Engl J Med July 3, 2003;349:45-50). (Reprints: Dr Kirk Hogan, Department of Anesthesiology, B6/319 Clinical Sciences Center, 600 Highland Ave, Madison, WI 53792).

COMMENT. Nitrous oxide irreversibly oxidizes the cobalt atom of vitamin B_{12}, and inhibits the activity of methionine synthase which catalyzes the remethylation of 5-methyltetrahydrofolate and homocysteine to tetrahydrofolate and methionine. Activated methionine is the principal substrate for the assembly of the myelin sheath, for methyl substitutions in neurotransmitters, and DNA synthesis in tissues. (Chiang PK et al. 1996). The authors propose that a nitrous oxide-induced defect of methionine synthase coupled with the inherited defect of MTHFR were responsible for the patient's death. They cite two recent case reports of infants with acute neurologic deterioration within days of nitrous oxide anesthesia. Both children had severe dietary cobalamin deficiency. The episodes were nonlethal. The above case ending in death followed two nitrous oxide anesthesias a few days apart, one for the biopsy and the other for tumor resection. In addition, the patient had an inborn error of metabolism involving MTHFR. Patients with MTHFR deficiency should not receive nitrous oxide anesthesia.

APOLIPOPROTEIN C-II DEFICIENCY WITH ENCEPHALOPATHY

Two siblings with severe hyperchylomicronemia and encephalopathy in early infancy are reported from Starship Children's Hospital, Aukland, New Zealand. Case 1 presented at 5 weeks of age with tachypnea, feeding problems, and lethargy, which followed a viral upper respiratory tract illness. Parents were second cousins, and some family members had died suddenly in infancy of unexplained illness. Abnormal physical signs included hypotonia, macrocephaly, a white retina, and hepatosplenomegaly. Venous blood was grossly hyperlipemic and appeared "strawberry cream" in color. Triglycerides and cholesterol were grossly elevated, secondary to lipoprotein lipase deficiency. After omitting breast milk and substituting a medium chain triglyceride formula (Monogen), the plasma triglyceride level fell slowly toward normal. MRI showed lipid deposition throughout the brain. Despite correction of lipid blood levels, she had severe developmental delay at 18 month follow-up, and the MRI was unchanged. Plasma apolipoprotein C-II, the lipoprotein responsible for activation of lipoprotein lipase, was absent in the patient and a sibling, also affected (Patient 2), and was below reference levels in all other family members. The sibling who was treated early developed normally. Both patients had a novel homozygous point mutation on sequencing of the APO-C-II gene. The parents and all other siblings were heterozygotes. (Wilson CJ, Oliva CP, Maggi F et al. Apolipoprotein C-II deficiency presenting as a lipid encephalopathy in infancy. Ann Neurol June 2003;53:807-810). (Dr Wilson, Metabolic Service, Starship Children's Hospital, Auckland, New Zealand).

COMMENT. This rare infantile "lipid encephalopathy" due to apolipoprotein C-II deficiency, and characterized by severe psychomotor retardation, pink venous blood,