SEIZURE DISORDERS

3-PGDH DEFICIENCY, SEIZURES, AND MICROCEPHALY

The beneficial effects of oral L-serine (up to 500 mg/kg/day) and glycine (200 mg/kg/day) in 2 siblings, aged 7 and 5 years, with 3-phosphoglycerate dehydrogenase (3-PGDH) deficiency are reported from University Children's Hospital, Utrecht, The Netherlands. The patients were born with microcephaly, development was retarded, and seizures started at 1 year, 10 to 50 daily, and were refractory to sodium valproate and clonazepam. EEG's showed multifocal epileptiform discharges. MRI showed cortical atrophy and hypomyelination. Laboratory tests showed megaloblastic anemia, thrombocytopenia, low plasma concentrations of serine and glycine, and low CSF methyltetrahydrofolate concentration. 3-PGDH activity in cultured skin fibroblasts was deficient (3.9 and 1.7 mU/mg protein). The parents 3-PGDH activity was normal (23 and 27 mU/mg of protein). Amino acid treatment resulted in complete control of seizures in 2 weeks, and the EEG abnormalities resolved in 6 months. Plasma serine and glycine concentrations also became normal during therapy, and no adverse effects were noted during 12 months of follow-up. (de Koning TJ, Duran M, Dorland L et al. Beneficial effects of L-serine and glycine in the management of seizures in 3-phosphoglycerate dehydrogenase deficiency. Ann Neurol Aug 1998;44:261-265). (Respond: Dr de Koning, Department of Metabolic Diseases, University Children's Hospital "Het Wilhelmina Kinderziekenhuis," Nieuwegracht 137, 3512 LK Utrecht, The Netherlands).

COMMENT. 3-Phosphoglycerate dehydrogenase (3-PGDH) deficiency is a rare inborn error of serine biosynthesis recently recognized and manifested by congenital microcephaly, seizures, and psychomotor retardation. Low concentrations of serine and glycine are found in plasma and CSF during fasting. Whereas serine supplements alone correct the anemia and are partially effective against seizures, the addition of glycine results in complete seizure control and improves behavior and alertness. Serine metabolism should be checked by fasting plasma amino acid determinations in infants with microcephaly and seizures.

BRAIN NEOPLASMS

POST-CHEMOTHERAPY SECONDARY BRAIN TUMORS IN INFANTS

The longterm outcome of 198 infants with malignant brain tumors treated postoperatively with prolonged chemotherapy (vincristine, cyclophosphamide, cisplatinum, and etoposide) is evaluated by a Pediatric Oncology Study Group. Four of 132 children, 7 to 23 months at diagnosis, and 1 of 66 who were diagnosed between 24 and 36 months developed second malignancies. The primary tumors were choroid plexus carcinomas (2), ependymoma (1), ganglioglioma (1), and medulloblastoma (1). Secondary neoplasms were myelodysplastic syndrome (2), acute myelogenous leukemia (1), sarcoma (1), and meningioma (1). The risk of developing a second malignancy 8 years after diagnosis was 11% in the total group; in children younger than 24 months at diagnosis the risk was 19%, and in children diagnosed at 24 to 36 months it was 5%. The high rate of secondary malignancies, especially leukemia, in infantile brain tumor patients may be attributed to the oncogenic potential of prolonged alkylating chemotherapy and etoposide, with or without irradiation. (Duffner PK, Krischer JP, Horowitz ME et al. Second malignancies in young children with primary brain tumors following treatment with prolonged postoperative chemotherapy and delayed irradiation: a pediatric oncology group study. Ann Neurol Sept 1998;44:313-316). (Respond: Dr