PEDIATRIC NEUROLOGY BRIEFS

A MONTHLY JOURNAL REVIEW

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

Vol. 5, No. 3 March 1991

DEVELOPMENTAL DISORDERS

SPINA BIFIDA AND CARBAMAZEPINE

The records of all pregnant Medicaid recipients in Michigan who were taking anti-epileptic agents during pregnancy were studied at the Center for Drug Evaluation and Research, Food and Drug Administration, Rockville, Maryland. Four cases of spina bifida were identified in infants born to 1,490 women who took anticonvulsants during pregnancy. Among 107 women taking carbamazepine three gave birth with spina bifida; one was taking valproic acid in addition and two were taking phenytoin, barbituates or primidone in combination with carbamazepine. Among 1,018 infants of mothers taking barbiturates alone only one had spina bifida. Among 444 women taking phenytoin and 50 taking primidone alone, none gave birth to an infant with spina bifida. When the data from approximately 20 published studies were pooled, nine cases of spina bifida occurred among a total of 984 in utero exposures to carbamazepine, and the relative risk was 13.7 times the expected rate (approximately one in 1,500 births). Five cases of spina bifida occurred in infants whose mothers took carbamazepine alone during pregnancy. While exposure to carbamazepine in utero carried a 1% risk of spina bifida the risk with valproic acid was close to 2% but the difference was not significant. The risks with other anticonvulsant drugs was only 0.14% or one in 748 cases. (Rosa, F.W. Spina bifida in infants of women treated with carbamazepine during pregnancy, N Engl J Med March 7, 1991; 324:674-677).

> COMMENT. The incidence of meningomyelocele has declined steadily from 12 per 10,000 in 1970 to 6 to 8 per 10,000 in 1980 among babies born in the United States. The neural tube closes between 22 and 29 days after conception and exposure to anti-epileptic agents such as valproic acid and carbamazepine

PEDIATRIC NEUROLOGY BRIEFS (ISSN 1043-3155) ©1991 covers selected articles from the world literature and is published monthly. Subscription requests ($33 US or £18 UK annually; add $8 (£4) for airmail outside North America) may be sent to: Pediatric Neurology Briefs - J. Gordon Millichap, M.D., F.R.C.P. - Editor, P.O. Box 11391, Chicago, IL 60611, USA, or Nat Wst Bnk, 94 Kensington High Street, London W8, UK. The Editor is Professor Emeritus at Northwestern University Medical School, Chicago, and is presently at Southern Illinois University School of Medicine, Springfield, Illinois, USA.

may interfere with closure. Meningomyelocele may be diagnosed in the fetus with 75 to 80% accuracy by measurements of serum alpha-fetoprotein levels, and ultrasonography can identify the extent and location of these defects. (Hobbins, J.C., Diagnosis and management of neural tube defects today, N Engl J Med, March 7 1991; 324:690-691).

The outcome of a neural tube defect may be improved by cesarean section before labor begins (Luthy, D A et al Cesarean section before the onset of labor and subsequent motor function in infants with meningomyelocele diagnosed antenatally, N Engl J Med March 7, 1991; 324:662-666). Infants who had been exposed to labor were 2.2 times more likely to have severe paralysis than those delivered by cesarean section without labor. The mean functional motor level was at the second lumbar vertebra in fetuses exposed to labor and at the fourth lumbar vertebra in those delivered before labor began. Cesarean section before onset of labor may result in better subsequent motor function and the ability to walk with minimal mechanical assistance.

CEREBRAL HEMIATROPHY: ETIOLOGY AND PATHOLOGY

Two types of cerebral hemiatrophy are reported from the Institute of Neuropathology at the University of Giessen, Arndtstrafse FRG. A case of "primary cerebral hemiatrophy" is described in a 12 year old boy whose birth was difficult and complicated by perinatal asphyxia. Seizures occurred immediately after birth and the psychomotor development was slow. He had spastic diplegia, asymmetrical, the right side predominating. He died at 12 years of age with cardiac arrest after status epilepticus. At autopsy the left hemisphere was reduced in size, the left lateral ventricle was enlarged and the white matter was decreased, especially on the left. The cerebral peduncles and pyramidal tracts were asymmetrical, and the neurons of the left hippocampus were replaced by glial tissue. Case two, an adult male, had a normal birth and early development and suffered from convulsions at two years of age which were followed by a right hemiparesis and homonymous hemianopsia. CT scan showed cerebral hemiatrophy and skull hypertrophy on the left side. The patient died at the age of 58 from intestinal hemorrhage with liver cirrhosis. The left cerebral hemisphere was atrophied and with crossed cerebellar and pyramidal tract atrophy. There was loss of cortical neurons in the atrophic left hemisphere and replacement by glial cells, a spongy state and abundant corpora amylacea. This was an example of "secondary cerebral hemiatrophy". The authors propose a classification of primary and secondary cerebral hemiatrophy. The primary forms are caused by vascular malformation, perinatal asphyxia and birth trauma and result in ulegyria, lamina necrosis and leukoencephalopathy. The secondary forms may be post-ictal with or without fever, cerebrovascular accident or leukoencephalitis. The pathological findings with the secondary form are sclerosing cortical atrophy and occasionally leukoencephalopathy (Vosskamper M, Schachenmayr W. Cerebral hemiatrophy: a clinical patho-