FORCED USE TREATMENT OF CHRONIC HEMIPARESIS

Twelve children (age 1 to 8 years) with chronic (>1 year) hemiparesis were treated by forced use, or constraint-induced, movement therapy at Tulane University School of Medicine, New Orleans, LA. Each received a plaster cast on the unaffected arm for 1 month, while 13 hemiparetic control children did not. Peabody Developmental Motor Scales (PDMS) and parental reports, used to assess change in function, were obtained on all children at entry, and at 1 month, 6 months, and 7 months after entry. Controls received casts after 6 months.

The casted children improved 12.6 PDMS points after 1 month, while the controls showed only 2.5 points improvement. Improvements had persisted in 7 children who returned after 6 months for follow-up testing. Ten control children who received casts at crossover showed similar gains in function. The measured improvements were corroborated by parental reports. Ongoing physical/occupational therapy was received by both casted and control patients and did not explain the greater improvement observed in the casted group. (Willis JK, Morello A, Davie A et al. Forced use treatment of childhood hemiparesis. Pediatrics July 2002;110:94-96). (Reprints: Dr John K Willis, Department of Psychiatry and Neurology, HC82, Tulane University School of Medicine, 1430 Tulane Ave, New Orleans, LA 70112).

COMMENT. Constraint-induced movement therapy has been proven effective in the rehabilitation of adults with stroke and hemiparesis. The above study at Tulane has demonstrated the benefits of this technique in children with hemiparetic cerebral palsy. Cerebrocortical reorganization is postulated as the mechanism of this form of therapy.

BRAIN NEOPLASMS

MANAGEMENT OF OPTIC CHIASMA/HYPOTHALAMIC GLIOMAS

A retrospective chart review of all newly diagnosed tumors involving the optic chiasm from 1982-1996 was performed at British Columbia's Children's Hospital, Vancouver, Canada. Of 32 patients, 14 (10 male) had chiasmatic and 18 (9 male) chiasmatic/hypothalamic astrocytomas. Neurofibromatosis I was present in 10 (71%) of the chiasmatic group and none of the chiasmatic/hypothalamic patients. Clinical presentations of chiasmatic tumors were decreased visual acuity (9), symptomatic neoplasms elsewhere (4), hydrocephalus (3), developmental delay (2), and precocious puberty (2). The most common presenting symptoms of chiasmatic/hypothalamic tumors were reduced visual acuity (11), elevated intracranial pressure (8), and diencephalic syndrome (7).

The majority (13) of chiasmatic tumors was managed by surveillance only, for an average follow-up of 5.7 years (range 1.9-14.8 yrs), and none showed progression requiring treatment. Six of the 14 had second non-optic gliomas (2 in the septum pellucidum, 2 brain stem gliomas, 1 temporo-patietal and 1 thalamic glioma) treated by resection, irradiation or chemotherapy.

The majority (17) of chiasmatic/hypothalamic tumors had surgical resection, subtotal in 8, partial in 6, limited in 3; one had no surgery. The extent of resection showed no correlation with the time to tumor progression (average 18 months). Limited resections were associated with fewer complications related to hypothalamic dysfunction. Diabetes insipidus developed in 5 of 8 with subtotal resection, all 6 with partial resection, and none with limited resection or biopsy only. The syndrome of inappropriate antidiuretic hormone secretion developed in 7 overall. One patient died in the early postoperative period and 4 died during

follow-up. If surgery is performed, it should be limited to a biopsy or decompression. (Steinbok P, Hentschel S, Almqvist P, Cochrane DD, Poskitt K. Management of optic chiasmatic/hypothalamic astrocytomas in children. Can J Neurol Sci May 2002;29:132-138). (Reprints: Dr Paul Steinbok, Division of Pediatric Neurosurgery, British Columbia's Children's Hospital, 4480 Oak Street, A323, Vancouver, BC, V6H 3V4, Canada).

COMMENT. Optic chiasmatic and optic chiasmatic/hypothalamic tumors are different in their clinical presentation and behavior. Neurofibromatosis I is a feature of only the optic chiasmatic tumors. Optic chiasmatic tumors are managed by observation and treatment is required mainly for associated non-optic tumors. In chiasmatic/hypothalamic tumors, radical resection should be avoided. Although radiotherapy is effective in preventing progression, it should be delayed as long as posible because of the risk of long-term complications. Chemotherapy as the first line of treatment for optic/hypothalamic tumors may delay the need for radiotherapy but it may not be effective in preventing progression.

COGNITIVE IMPAIRMENT FOLLOWING INTRATHECAL METHOTREXATE FOR MEDULLOBLASTOMA

Intelligence, executive function, attention, visual perception, and short-term memory were assessed in two groups of children who underwent surgery and subsequent radiotherapy and chemotherapy for cerebellar medulloblastoma at the Carlo Besta National Neurologic Institute, Milan, Italy. All 21 patients selected received the same combined radiotherapy-chemotherapy, but only one group (11 patients) was treated with intrathecal methotrexate (MTX) in addition. Both groups performed worse on cognitive tests than matched controls (cousins and siblings). Children younger than 10 years receiving MTX had significantly lower scores in all tests, and particularly executive function. Their impaired performance on arithmetic, comprehension, and block design was directly correlated with the extent of periventriculat leukomalacia observed on MRI. Only short-term memory was impaired in the MTX patients older than 10 years. In the group not receiving MTX, the 3 to 10 year old patients did significantly worse than controls in three tests only, whereas patients older than 10 showed no impairment in test performance compared to controls. The use of intrathecal methotrexate in the treatment of medulloblastoma should be reassessed. (Riva D, Giorgi C, Nichelli F et al. Intrathecal methotrexate affects cognitive function in children with medulloblastoma. Neurology July (1 of 2) 2002;59:48-53). (Reprints: Dr Daria Riva, Divisione di Neurologia dello Sviluppo, Instituto Nazionale Neurologico, Via Celeria, 11, 20133 Milano, Italy).

COMMENT. Intrathecal methotrexate therapy in children with medulloblastoma may worsen the cognitive deficits induced by chemotherapy and radiotherapy. Children younger than 10 years are especially at risk of impaired cognitive function following methotrexate.

The increase in survival rate of children with brain tumors over the past 20 years has been accompanied by a decrease in intellectual functioning and other complications. (Duffner PK, Cohen ME. 1991; see Progress in Pediatric Neurology II, PNB Publ, 1994;pp339-341). The omission of methotrexate may avoid the complications of leukoencephalopathy and dementia. Complications of cranial irradiation are reviewed in Progress in Pediatric Neurology III, 1997;pp423-430.