

INFECTIOUS DISORDERS

PREVALENCE AND PROGNOSIS OF INTRACEREBRAL ABSCESS

Of 386 patients treated for intracerebral abscess at Children's Hospital, Boston between 1981 and 2000 and identified from databases, 55 had the diagnosis confirmed by cranial imaging or autopsy reports. A retrospective review of the records of these 55 patients, compared to a similar study of the natural history of intracerebral abscess in 94 patients treated between 1945 and 1980, showed that congenital heart disease was the most common predisposing factor during both time periods. The more recent case studies, compared to the earlier era, revealed a similar annual rate of cerebral abscess (2.75 vs 2.68), a decrease in the frequency of abscesses associated with sinus or otitic infection (11% in 1981-2000 vs 26% in 1945-1980), an increase in infants affected (18% vs 7%), an increased number associated with acute immunosuppressive diseases (16% vs 1%), an increase in cases treated with antibiotics alone (22% vs 1%), no significant change in mortality (24% vs 27%), and previously unrecognized *Citrobacter* causative organism (only in 3 neonatal cases) and fungus infection (predominantly in immunosuppressed patients), not encountered in the 1945-1980 era.

Ages of the 1981-2000 patients ranged from 5 days to 34 years. Of the infants in the study, 7 were younger than 8 weeks at presentation and 5 were younger than 1 month. Of 9 children classified as immunosuppressed, 6 had organ transplantations, 2 were treated for acute lymphoblastic leukemia, and 1 had hyperimmunoglobulin M syndrome. Abscesses were single in 37 and multiple noncontiguous in 18. Cultures obtained by aspiration, resection, or biopsy on 42 occasions identified pathogens in 36 (86%), with two or more organisms in 14. *Streptococcus milleri* was the most frequent isolate. Of 9 with fungal infections, 7 were immunosuppressed and all died. Presenting symptoms included headache in 27 (50%), with vomiting (12), photophobia (5) and fever (16); seizures in 15 (27%); changes in mental status (lethargy to coma) in 17 (31%); and other neurological signs including paresthesias (4), hemiparesis (4), and increasing head circumference in 3. All except one received antimicrobial therapy, alone or in combination with surgery. A surgical treatment, aspiration (20) or resection (3), was performed in 42 (76%) cases. Two or more procedures were required in 20. Thirteen (24%) patients died; the most common cause of death was multisystem failure. Of 24 patients followed after discharge, 7 had recovered, 10 had developmental delay or learning disorders, 6 had epilepsy, and 3 developed hydrocephalus that required a VPO shunt. Despite improvements in the diagnosis due to neuroimaging, brain abscess continues to result in high rates of neurologic impairment and death. (Goodkin HP, Harper MB, Pomeroy SL. Intracerebral abscess in children: historical trends at Children's Hospital Boston. *Pediatrics* June 2004;113:1765-1770). (Reprints: Howard P Goodwin MD, PhD, Department of Neurology, Box 800394, University of Virginia, Health Science Center, Charlottesville, VA 22908).

COMMENT. A brain abscess consists of localized pus within the brain substance. Organisms enter the brain via the blood stream from a distant infection by contiguous spread from the middle ear or paranasal sinuses, from a penetrating wound, or in association with cyanotic congenital heart disease with right-to-left shunt. Abscesses resulting from hematogenous spread may be localized in any part of the brain, most commonly at the

junction of gray and white matter, whereas those arising from contiguous sources are usually superficial and close to the infected bone or dura. During the initial cerebritis (septic encephalitis) stage, the clinical picture is nonspecific. A patient with heart disease develops headache, vomiting, seizures, and fever. As the abscess forms, the neurologic signs become more apparent and lateralizing, with hemiparesis, hemianopia, papilledema, and localized percussion tenderness of the skull. (Raimondi et al. 1965). The EEG shows focal slowing, and CT confirms the diagnosis. In the differential diagnosis, thromboses of arteries, veins and dural sinuses are common in cyanotic infants, and symptoms may mimic an abscess, except the onset is more abrupt. Thromboses are rare in infants older than 2 years. Hypoxic attacks occur in 12% to 15% of patients with cyanotic heart disease and are common during the first 2 years of life. Meningitis may also mimic an abscess before symptoms and signs become lateralized. (Menkes JH, 1980). The diagnosis of brain abscess should be considered with new-onset headache and seizure, especially in a child with congenital heart disease or recent sinus or ear infection, commonly *Streptococcus milleri* (*S intermedius*), and in an acutely immunosuppressed patient with fungal disease.

MRI/MRS STUDY OF ADEM

Magnetic resonance imaging and H magnetic resonance spectroscopy were used to detect possible structural and neurochemical abnormalities in two children, ages 6-months and 4.5 years, with acute disseminated encephalomyelitis at the State University of New York, Stony Brook, New York. The infant presented with focal seizures and thalamic and cerebral white matter lesions, and the older child with tremor and dystonia with bilateral basal ganglia lesions. Both recovered without the use of steroids or IV immunoglobulin. H MRS of involved areas showed abnormalities in N-acetyl-aspartate, choline, and lactate peaks during the symptomatic phase, and a low N-acetyl-aspartate persisted during recovery. The MRS findings are consistent with neuronal dysfunction, cellular membrane turnover, cellular infiltration, and metabolic stress in the acute phase, and with neuronal loss in the chronic phase. (Gabis LV, Panasci DJ, Andriola MR, Huang W. **Pediatr Neurol** 2004;30:324-329). (Respond: Dr Lidia V Gabis, Pediatric Neurology, Safra Children's Hospital, Sheba Medical Center, Tel Hashomer, Israel 52621).

COMMENT. Metabolic studies using magnetic resonance spectroscopy should aid in diagnosis of ADEM and may prove of value in following the course of the disease and the need for therapy.

MRS METABOLITES IN RASMUSSEN ENCEPHALITIS

The evolution of metabolite changes in an 8-year-old boy with focal Rasmussen encephalitis was studied by MRI and MRS at the Brain Research Institute, University of Melbourne, Australia. Serial structural and metabolite changes during a 9-month period which included an episode of complex partial status epilepticus showed focal swelling and a marked increase in T2-weighted signal intensity in the superior temporal gyrus following status. Follow-up scans showed resolution of the swelling and the development of slight focal atrophy. MRS showed a reduction in N-acetyl-aspartate, total creatine and trimethylamines after status. These metabolite changes had resolved in subsequent MRS