

LETTERS TO THE EDITOR

Neurocysticercotic versus idiopathic epilepsy: a comparative study of 175 patients

Epilepsy seems to be the most common clinical manifestation of neurocysticercosis (NC),^{1,2} while NC has been regarded as the most commonly identifiable cause of epilepsy in some developing countries.^{3,4}

Two groups of chronic epileptics, one with NC (61 patients) and the other with idiopathic epilepsy (in whom no cause of epilepsy could be identified) and normal CT scan (114 patients), were compared for sex, age, age of onset of epilepsy, type of epilepsy (International Classification 1981),⁵ and EEG findings. These patients were prospectively and randomly selected from a group of 580 epileptic outpatients who were evaluated and studied during the past four years. Single convulsions and patients less than 10 years old were excluded. A normal neurological examination was a criterion of inclusion in both groups. CT was performed in each case, and CSF examination when indicated. Only patients with a normal CT scan were included in the idiopathic epilepsy group. A standard 8-channel EEG was obtained in all patients. An EEG was considered abnormal if generalised or focal spike discharges or sharp waves were present or if paroxysmal slow activity (delta or theta; generalised or focal) was observed in the absence of spike discharges or sharp waves. The diagnosis of NC was made with the following criteria: 1) CT scan findings compatible with NC;⁶ 2) Positive CSF immunological test (indirect immunofluorescence or indirect haemagglutination) for NC; and 3) Surgical diagnosis of NC. For the control of seizures, a patient was considered free of seizures when epileptic fits did not occur after one year of drug therapy and follow up. All the patients were taking anticonvulsant drugs regularly at the time of this study.

The most common tomographic finding in

the NC group was multiple parenchymal calcifications (n = 55, 90.1%), followed by parenchymal cysts (n = 10, 16.4%), and hydrocephalus (n = 3, 4.9%).

CSF examination was performed in 18 (29.5%) patients of the NC group. Ten patients (16.4%) with neurocysticercosis showed alterations in the CSF, as follows: elevated protein levels (more than 50 mg/dl) 6, pleocytosis (more than five cells/cu mm) 7 (all with mononuclear preponderance), positive immunological test for NC in nine cases. Low CSF glucose levels were not observed in any case. Eosinophils (more than 5%) were observed in two cases. Twelve patients (19.7%) had the active form of NC, according to the classification of Sotelo *et al.*² A spinal tap was performed in 32 (28.0%) patients with idiopathic epilepsy, as part of another protocol of investigation not related to this work. All CSF examinations of the idiopathic group were normal.

There was a higher proportion of late onset epilepsy (onset over 25 years old) in the NC group (28) (46.6%), compared with the idiopathic group (33) (29.4%) [Chi square test = 5.0515; p < 0.05]. Normal EEGs were more prevalent in the NC group. Among the patients with the active form of NC, only one (8.3%) had an abnormal EEG, which consisted of continuous slowing of the right posterior temporal area. In both groups, there was a high proportion of focal EEG abnormalities. No type of epilepsy was characteristic of either group of patients. The modality of drug therapy and the control of seizures did not differ significantly between both groups (table).

The only features distinguishing the NC epileptics from the idiopathic epileptics were the increased prevalence of late onset epilepsy and the higher number of normal EEGs in the NC group. The greater proportion of late onset epilepsy may be due to the average large interval from the initial infestation to onset of symptoms (up to 30 years). The great proportion of normal EEGs in patients with NC has already been observed by other authors,^{1,7} even in the active forms. In addition, focal EEG abnormalities are more prevalent than diffuse.⁷ The number of normal EEGs in the idiopathic group is in keeping with previous reports.⁸ Although there was a tendency for more female epileptics in the NC group, this difference did not reach statistical significance. This observation may be due to sex related

differences in the intensity of the host inflammatory response to cysticerci in the central nervous system.⁹

In conclusion, any patient with late onset epilepsy, with a normal neurological examination, and living in an endemic area of taeniasis/cysticercosis, should be considered as having neurocysticercosis, regardless of the seizure type and the EEG findings.

W O ARRUDA
 Serviço de Neurologia,
 Centro de Saúde Metropolitano,
 Secretaria de Saúde do Estado,
 Curitiba PR, Brazil

Correspondence: Dr Arruda, Rua Gonçalves Dias 713, 80-240 Curitiba PR, Brazil.

- 1 Canelas HM. Neurocysticercose: incidência, diagnóstico e formas clínicas. *Arq Neuro-psiquiatria* 1962;20:1.
- 2 Sotelo J, Guerrero V, Rubio F. Neurocysticercosis: a new classification based on active and inactive forms. A study of 753 cases. *Arch Intern Med* 1985;145:442.
- 3 Shorvon SD, Farmer PJ. Epilepsy in developing countries: a review of epidemiological, sociocultural, and treatment aspects. *Epilepsia* 1988;29(suppl 1):S36.
- 4 Arruda WO. Etiology of epilepsy: a prospective study of 210 cases. *Arqu Neuro-psiquiatria* (in press).
- 5 Proposal for revised clinical and electroencephalographic classification of epileptic seizures. *Epilepsia* 1981;22:489.
- 6 Minguetti G, Ferreira MV. Computed tomography in neurocysticercosis. *J Neurol Neurosurg Psychiatry* 1983;46:936.
- 7 Marques-Assis L, Ortiz Filho L. A epilepsia na neurocysticercose. *Arq Neuro-psiquiatria* 1972;30:297.
- 8 Goodwin DS, Aminoff MJ. Does the interictal EEG have a role in the diagnosis of epilepsy? *Lancet* 1984;1:837.
- 9 Del Brutto OH, Garcia E, Talamas O, Sotelo J. Sex-related severity of inflammation in parenchymal brain cysticercosis. *Arch Intern Med* 1988;148:544.

Angiostrongylus cantonensis abscess in the brain

Angiostrongylus cantonensis is a rat lung worm with a geographical distribution from Madagascar to Hawaii. Humans are a paratenic intermediate host and angiostrongyliasis can present with protean clinical manifestations. Diffuse eosinophilic meningoencephalitis is the commonest presentation caused by the young adult worms in the subarachnoid space. We report an angiostrongylus abscess presenting with focal seizures which to our knowledge is the first report of its kind.

A 45 year old man presented with headache and right focal tonic clonic seizures, which he had had for a few months, starting in the right eyelid and face, with subsequent generalisation. On examination he had right spastic hemiparesis grade IV. There were no signs of raised intracranial pressure or any systemic disease. Plain and contrast CT scan of the head showed a left parietal enhancing disc shaped lesion 2 cm in diameter (fig 1). He was treated with anti-tuberculous and anticonvulsant drugs after a presumptive diagnosis of tuberculoma. Two months later he presented with abnormal tonic movements in the right upper limb. On examination he had spastic right hemiparesis grade III-IV with atrophy of the right upper and lower limb muscles. There were no features of raised ICP. Routine haematological and biochemical tests were normal. ESR, eosinophil count, EEG,

Table Clinical findings of NC and idiopathic group of chronic epileptics

	Neurocysticercosis	Idiopathic
Total number	61	114
Sex (M/F)	24/37	60/54
Sex ratio	1.0:1.5	1.1:1.0
Present age, mean (SD)	35.6 (14.2)	32.8 (12.4)
Type of epilepsy		
1) Generalised	27 (44.2%)	53 (46.5%)
2) Partial		
Simple	3 (4.9%)	4 (3.5%)
Complex	6 (9.8%)	7 (6.1%)
3) 1 + 2	4 (6.5%)	10 (8.7%)
4) Secondarily generalised	18 (29.5%)	36 (31.5%)
5) Unclassifiable	3 (4.9%)	1 (0.9%)
Normal EEG	43 (70.5%)	62 (54.4%)*
Abnormal EEG	18 (29.5%)	52 (45.6%)
Focal	13 (72.7%)	30 (57.7%)
Generalised	5 (27.7%)	22 (42.3%)
Therapy		
Monotherapy	51 (83.6%)	82 (72.0%)
Control of seizures		
Free of seizures	36 (59.0%)	72 (63.1%)
Decrease of frequency	21 (34.4%)	32 (28.0)
Unchanged	4 (6.5%)	10 (8.7%)

*—Chi square test, p < 0.05.