CASE REPORT

ALBENDAZOLE TREATMENT OF NEUROCYSTICERCOSIS

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Neurocysticercosis (NC) is a common parasitosis affecting the central nervous system. It is endemic in many developing countries. Praziquantel was the first drug to show potential efficacy for treatment of NC (Sotelo *et al,* 1984). Recently albendazole, an imidazole with activity against intestinal and systemic infections by trematodes and cestodes (Anonymous, 1984), demonstrated its efficacy in parenchymal NC (Escobedo *et al,* 1987). This study presents our experience in the treatment of parenchymal NC with albendazole.

From October 1988 to May 1990, 12 patients with a diagnosis of parenchymal NC, were admitted to the Department of Medicine, Srinagarind Hospital, Khon Kaen, Thailand. All cases were diagnosed according to the characteristic clinical features and typical macroscopic cerebral cysts shown by computed tomographic (CT) scans with and without contrast.

Each patient was treated with oral albendazole at a daily dose of 15 mg/kg body weight distributed in two doses, for one month. Antiepileptic drugs were also given throughout the study for about 3 months for cases with convulsive disorders.

Clinical status was evaluated during and after treatment for every patient. Evaluation of therapeutic response, as measured by a reduction or disappearance in the number of lesions, was made with CT scan at the end of treatment or 3 months after starting treatment.

Of the 12 patients, 7 were men and 5 were women. Age incidence ranged from 16-60 years with a mean of 32 years. Eleven cases presented

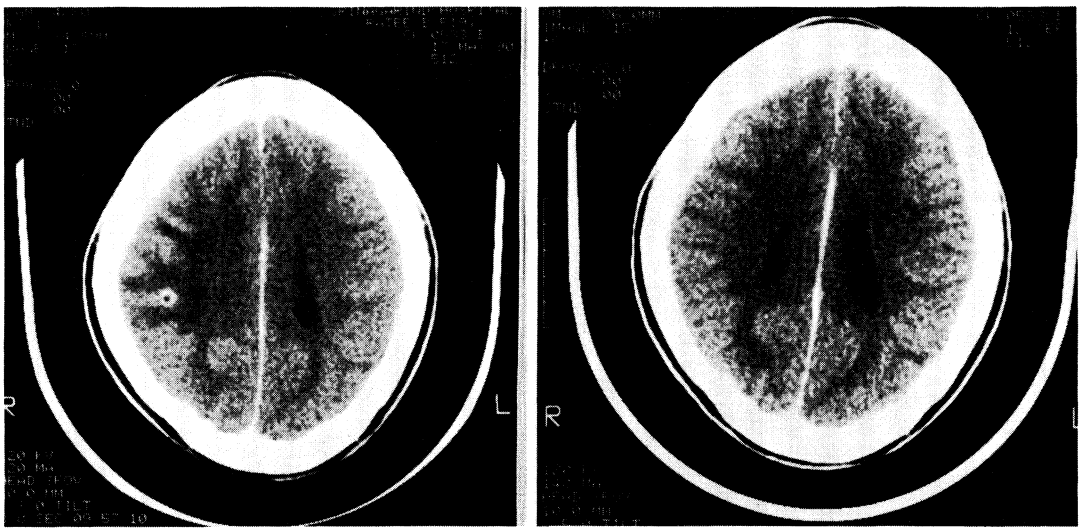

Fig —Left, contrast computed tomographic (CT) scan before treatment (patient no. 12) shows a ring enhancement with perilesional edema. Right, 3 months after treatment CT scan shows disappearance of the lesion.

Table 1

Symptoms and signs.

Case no.	Sex	Age (years)	Symptom	Time of the first attack prior to admission	Neurological examination
1	male	34	generalized seizure	1 year	normal
2	female	16	focal with 2°* generalized seizure	3 weeks	lt hemiparesis
3	female	27	focal with 2° generalized seizure	1 week	rt hemiparesis
4	male	34	focal with 2° generalized seizure	2 years	normal
5	male	54	generalized seizure	5 days	normal
6	male	29	generalized seizure	1 week	normal
7	male	30	focal with 2° generalized seizure	1 year	normal
8	male	60	focal with 2° generalized seizure	2 days	rt hemiparesis
9	male	41	headache	1 month	mild disorientation, papilledema
10	female	20	focal with 2° generalized seizure	2 days	rt hemiparesis
11	female	25	generalized seizure	1 week	normal
12	female	19	focal with 2° generalized seizure	3 weeks	normal

* 2° = secondary

with epilepsy and 1 case (no. 9) presented with symptoms and signs of increased intracranial pressure (Table 1). Eosinophilia was present in many cases (Table 2), one of 3 cases examined had *Taenia* eggs in the stools, while x-ray of soft tissue for calcified cysticercosis was negative in all cases and abnormal CT scan of the brain revealed single ringlike enhancement with perilesional edema in 5 cases, single nodular enhancement with perilesional edema in 4 cases, focal edema without enhancement in 2 cases (single lesion 1 case, multiple lesions 1 case) and multiple ringlike enhancement with brain edema in 1 case (Table 3).

During treatment with albendazole, no patient had an epileptic attack. Of 5 patients with abnormal neurological signs, these signs gradually

Table 2

Laboratory data

Case no.	Eosinophils % in blood smear	*Taenia* eggs in stools	CSF	
			Before treatment	After treatment
1	8	ND	-	-
2	20	ND	normal	-
3	ND	ND	-	-
4	ND	+ve	normal	-
5	ND	ND	-	-
6	11	−ve	normal	-
7	ND	ND	WBC 236/mm^3 (L 54%, E 46%) protein 60 mg% sugar normal	WBC 327/mm^3 (L 80%, E 20%) protein 76 mg% sugar normal
8	ND	ND	normal	-
9	8	ND	pressure 600 mmH_2O WBC 27/mm^3 (L 68%, E 32%) protein 100 mg% sugar normal	
10	0	ND	-	-
11	ND	ND	-	-
12	24	−ve	normal	-

ND = not done
CSF = cerebrospinal fluid, WBC = white blood cells, L = llymphocytes, E = eosinophils.

improved after starting the medication.

The results of CT scanning of the brain after treatment are summarized in Table 3. They were normal in 8 cases, improvement of the lesion (disapprearance of perilesional edema) was evident in 2 cases and calcification was apparent in 2 cases.

In 1 case a generalized maculo-papular rash developed at the 20th day of medication and improved with antihistamine. Otherwise there were no side effects of albendazole treatment.

The patients were observed for 15-35 months (mean 24.5 months) after completion of treatment. All were healthy except 1 case (case no. 2) who developed an epileptic attack 5 months after treatment. Repeated CT scan revealed normal findings. Anticonvulsant therapy was given but the patient was lost to follow-up.

These and previous studies (Escobedo *et al,* 1987; Sotelo *et al,* 1988) demonstrate that albendazole is highly effective for the treatment of parenchymal NC. Adverse effects, due to the inflammatory reaction produced by the host in response to the dead parasites, are minimal and can be controlled with symptomatic drugs. Albendazole is also effective in patients who have shown poor theraputic response to praziquantel (Escobedo *et al,* 1987), and thus is an alternative drug for treatment of neurocysticercosis.

Table 3

Results of CT scanning before and after treatment.

Case no.	CT scan of brain		
	Initial	Last day of treatment	3 months after treatment
1	LcN	-	normal
2	LcN	-	normal
3	LcR	-	improvement
4	LcR	-	improvement*
5	LcR	-	normal
6	L	-	normal
7	multiple L	-	normal
8	LcN	-	calcification
9	multiple LcR, generalized brain edema	normal	-
10	LcR	-	calcification
11	LcN	-	normal
12	LcR	-	normal

CT = Computed tomography, L = Localized low density area, N = Nodular enhancement, R = Ring enhancement, c = With, - = not done, * = turn to normal at 6 months later

REFERENCES

Anonymous. Albendazole : worms and hydatid disease [Editorial]. *Lancet* 1984; 2 : 675-6.

Escobedo F, Penagos P, Rodriguez J, *et al.* Albendazole therapy for neurocysticercosis. *Arch Intern Med* 1987; 147 : 738-41.

Sotelo J, Escobedo F, Rodriguez-Carbajal J, *et al.* Therapy of parenchymal brain cysticercosis with praziquantel. *N Engl J Med* 1984; 310 : 1001-7.

Sotelo J, Escobedo F, Penagos P. Albendazole vs praziquantel for therapy for neurocysticercosis. A controlled trial. *Arch Neurol* 1988; 45 : 532-4.