Neurology Asia 2004; 9 (Supplement 1) : 118 – 119

A comparative study of seizure frequency and neuroimaging changes in patients with neurocysticercosis with and without albendazole therapy

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Objective: Neurocysticercosis is a common cause of acquired epilepsy in developing countries. In India, 5.3 to 11 % of patients with epilepsy have neurocysticercosis. The role of antiparasitic albendazole therapy remains controversial due to lack of adequately controlled studies. This study aims to evaluate the role of albendazole therapy in the neurocysticercosis patients with two or more lesions to achieve seizure free status and complete resolution of lesions.

Methods: This was a retrospective-prospective cohort study from January 1997 to January 2004 comprising of 120 neurocysticercosis patients with more than one lesion in contrast CT or MRI brain scan. The patient had history of seizure within two weeks of enrolment. Exclusion criterias were primary seizure disorder, family history of seizure, preexisting focal neurological deficit, any metabolic or hereditary diseases.

The patients were divided in two groups. Group A (n = 60) received albendazole 15 mg/Kg/day for 14 days, dexamethasone 2 mg 8 hourly for 14 days and then tapered off, and antiepileptic drugs at appropriate doses. Group B (n = 60) received antiepileptic drugs only (control). Each patient was followed up at monthly intervals for first 6 months and then at 3 monthly intervals for 4 years. The outcomes were evaluated by recurrence of seizure, encephalopathy (presence of headache, vomiting and altered sensorium), hospital readmission, death, resolution of lesions in the follow up CT brain.

Results: The albendazole group consisted of 32 males and 28 females, mean age of 28 $\pm$ 2 years. The control group consisted of 34 males, 26 females, mean age of 30 $\pm$ 2 years. Table 1 shows the clinical and imaging results from 3 months to 4 years. At 3 months, there was increased seizure, encephalopathy and hospital readmission in patients treated with albendazole. Two patients on albendazole expired due to intractable seizure and encephalopathy. More seizures and hospital readmission continued to be observed in the albendazole group at 6 months.

Discussion and Conclusion: The role of albendazole in neurocysticercosis for resolution of lesions and seizure control is controversial for more than 20 years. An open controlled trial in 1995 showed no significant differences between the albendazole group and control in seizures and radiological changes of cysts.[1] A recent trial however, showed that albendazole decreased the burden of parasites and reduced the number of seizures.[2] Our study showed increased seizure, encephalopathy and hospital readmission in patients treated with albendazole. Acute perilesional inflammation and edema from exposure to parasitic antigen as the drugs act on the cysts may be the possible mechanism. There is also no evidence of long term benefit to use of albendazole based on clinical evaluation and imaging.

References

1. Carpio A, Santillan F, Leon P, *et al.* Is the course of neurocysticercosis modified by treatment with antihelminthic agents? *Arch Intern Med* 1995; 155: 1982-8
2. Garcia HH, Pretell EJ, Gilman RH, *et al*. A trial of antiparasitic treatment to reduce the rate of seizure due to cerebral cysticercosis. *N Engl J Med* 2004; 350: 249-58

Table 1: Status of patients after 3 months to 4 years of albendazole

	3 months			6 months		
	Group A (n = 60)	**Group B (n = 60)**	**P value**	**Group A (n = 58)**	**Group B (n = 60)**	**P value**
Seizure	28 (47%)	12 (20%)	< 0.001	15 (26%)	8 (13%)	< 0.05
Encephalopathy	15 (25%)	4 (7%)	< 0.001	2 (3%)	1 (2%)	NS
Readmission	24 (40%)	2 (3%)	< 0.001	8 (14%)	2 (3%)	< 0.05
Death	2 (3%)	0		0	0	
Imaging: Complete Resolution	4 (7%)	4 (7%)	NS	4 (7%)	6 (10%)	NS
Partial Resolution	30 (50%)	32 (53%)	NS	28 (48%)	30 (50%)	NS
Calcification	2 (3%)	2 (3%)	NS	2 (4%)	2 (3%)	NS
No Changes	24 (40%)	22 (37%)	NS	24 (41%)	22 (37%)	NS

	1 year			2 years		
	Group A (n = 58)	**Group B (n = 60)**	**P value**	**Group A (n = 58)**	**Group B (n = 60)**	**P value**
Seizure	12 (21%)	8 (13%)	NS	6 (10%)	4 (7%)	NS
Encephalopathy	2 (4%)	1 (2%)	NS	0	0	
Readmission	8 (14%)	2 (3%)	< 0.05	6 (10%)	0	
Death	0	0		0	0	
Imaging: Complete Resolution	12 (21%)	23 (38%)	< 0.05	20 (35%)	26 (43%)	NS
Partial Resolution	22 (38%)	20 (33%)	NS	8 (14%)	8 (13%)	NS
Calcification	14 (24%)	8 (13%)	NS	26 (45%)	24 (40%)	NS
No Changes	10 (17%)	9 (15%)	NS	4 (7%)	2 (3%)	NS

	4 years		
	Group A (n = 58)	**Group B (n = 60)**	**P value**
Seizure	4 (7%)	2 (3%)	NS
Encephalopathy	0	0	
Readmission	2 (4%)	0	
Death	0	0	
Imaging: Complete Resolution	26 (45%)	33 (55%)	NS
Partial Resolution	0	0	
Calcification	32 (55%)	27 (45%)	NS
No Changes	0	0	

Group A: Albendazole and dexamethasone for 14 days, antiepileptic drugs
Group B: Antiepileptic drugs only