

SHORT REPORT

Albendazole therapy for subarachnoid cysticerci: clinical and neuroimaging analysis of 17 patients

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Abstract

Seventeen patients with subarachnoid cysticerci received albendazole at doses of 15 mg/kg/day for eight days. All patients also received corticosteroids during the trial. Evaluation of the therapeutic response consisted of the comparison of the number of cysts shown by CT before and three months after treatment, and the evaluation of the clinical status of the patients before and after the trial. Before treatment, the 17 patients had 30 subarachnoid cysticerci, 11 of which were > 50 mm in diameter. Seventeen cysts were located at the convexity of cerebral hemispheres, seven at the sylvian fissure, five at the ambiens cisterns, and one at the cerebellopontine angle cistern. Fourteen patients had seizures, 10 had hemiparesis, three were demented, one had diminution of visual acuity, and one had hemifacial spasm. Brain CT obtained after therapy showed resolution of 27 cysts (90% effectiveness). Fourteen (82%) patients had total resolution of all cysts. All but three patients were asymptomatic. Remaining deficits included hemiparesis in two patients and diminution of visual acuity in one. It is concluded that albendazole is an effective treatment for subarachnoid cysticerci as it causes disappearance of most lesions on CT, and produces considerable improvement in the clinical manifestations of the patients.

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Cysticidal drugs destroy up to 85% of parenchymal brain cysticerci, and result in clinical improvement in most patients.^{1,2} Nevertheless, subarachnoid cysts have been difficult to treat and most patients with this form of neurocysticercosis have a poor prognosis.³ Praziquantel has little effect on subarachnoid cysts because of its poor penetration of the subarachnoid space. By contrast, albendazole reaches high concentrations in CSF and has been used with success in some patients with subarachnoid cysts.⁴⁻⁶ However,

it has been argued that destruction of subarachnoid cysts by albendazole may cause adverse reactions due to their proximity to blood vessels or cranial nerves at the base of the brain. This study evaluates the efficacy and safety of albendazole in a series of patients with subarachnoid cysticerci.

Patients and methods

Seventeen patients (12 men and five women, mean age 47.6 (SD 14.2) years) with subarachnoid cysticerci were prospectively treated with albendazole at daily doses of 15 mg per kg of body weight for eight days. All patients received corticosteroids from two days before albendazole until one week after the trial had been completed. Intravenous dexamethasone (8 to 12 mg per day) was used in 12 patients who were admitted to hospital, and oral prednisone (50 mg per day) was given to the five patients treated on an outpatient basis. Antiepileptic drugs were continued during and after the trial for those patients with seizures. Intermittent doses of 100 ml 20% mannitol were used in patients who developed intracranial hypertension during the trial.

Diagnosis of subarachnoid cysticerci was based on appearance on CT of hypodense cystic lesions located over the convexity of the cerebral hemispheres, the sylvian fissure, or the CSF cisterns at the base of the brain. We only included viable cystic lesions that did not enhance after giving contrast medium. Evaluation of the therapeutic response to albendazole included the objective comparison of the size of the cysts shown by CT before and three months after the end of treatment as well as the clinical evaluation of the patients before and after the trial.²

Results

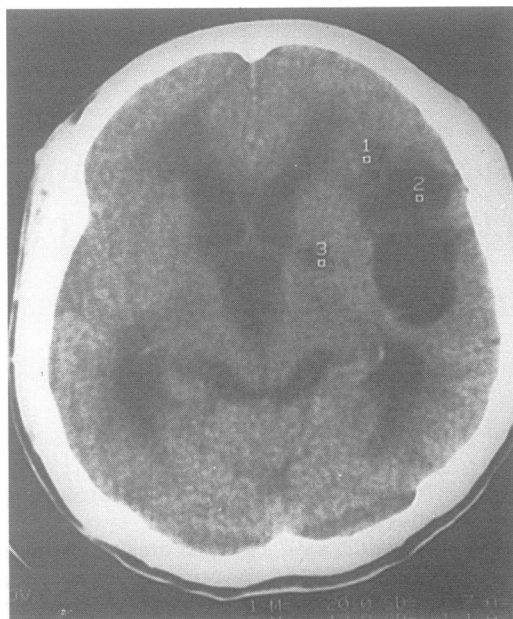
Before treatment, the 17 patients had 30 subarachnoid cysticerci, 11 of which measured 50 mm or more in diameter (giant cysts). Eleven patients had a single subarachnoid cyst and six patients had two to five cysts. Seventeen cysts were located over the convexity of the cerebral hemispheres, seven at the sylvian fissure, five at the ambiens cisterns, and one at the cerebellopontine angle cistern. In addition, seven patients also had a total of 27 parenchymal

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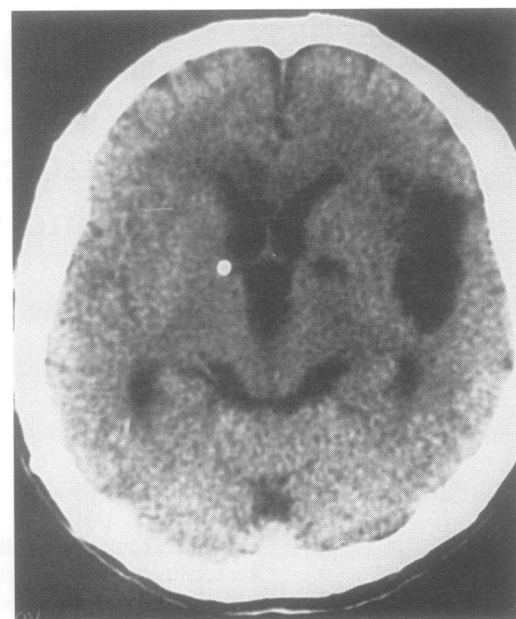
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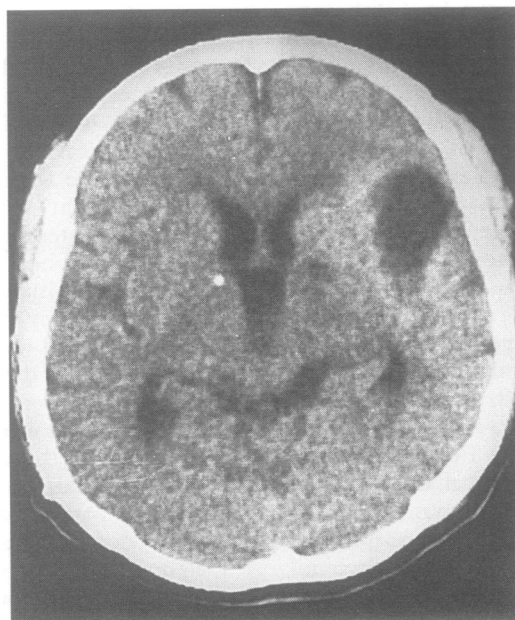
(A) Brain CT at the time of admission showing acute hydrocephalus and a large subarachnoid cysticerci located at the left sylvian fissure. (B), (C), and (D), Brain CT obtained three, six, and nine months respectively after the end of treatment, showing the progressive reduction in size and the complete disappearance of the cyst as the result of albendazole treatment. The hydrocephalus was resolved with a ventricular shunt before the start of the trial with albendazole.



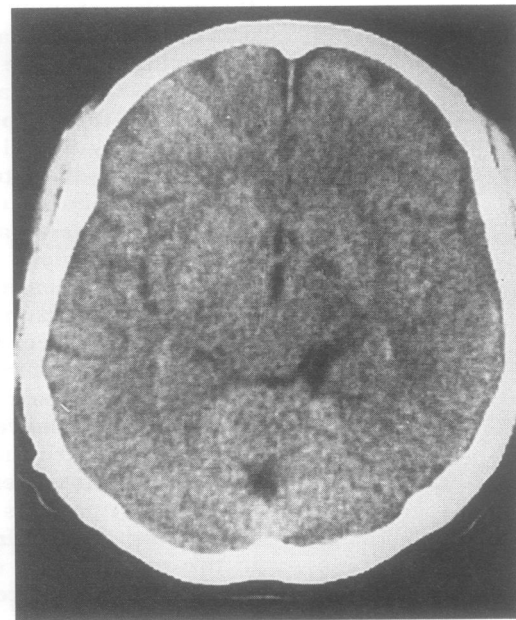
A



B



C



D

brain cysts, three had hydrocephalus, two had parenchymal brain calcifications, and one had a small capsular infarct.

All patients had a chronic neurological picture from several months to years before admission. Fourteen patients had seizures, 10 had hemiparesis, five had headache or vomiting, three were demented, two had papilloedema, one had diminution of visual acuity due to optic atrophy, and one had a hemifacial spasm. Nine of the 10 patients with hemiparesis had giant cysts contralateral to the motor deficit. The two patients with papilloedema and the patient with optic atrophy had hydrocephalus. These patients underwent a ventricular shunt as the first therapeutic measure, and by the time they entered the study, they had no evidence of increased intracranial pressure.

Ten patients had headaches during albendazole treatment. This was ameliorated with

analgesics in eight patients. The other two patients (both with giant cysts) required mannitol for relief of symptoms. Three patients had transient worsening of their hemiparesis and one patient had generalised seizures during the trial. These manifestations improved spontaneously in every case.

Brain CT obtained three months after the end of albendazole treatment showed complete resolution of 22 cysts and reduction in the size of five cysts. The remaining three cysts did not show changes compared with CT obtained before treatment. Twenty five of the 27 parenchymal brain cysts also disappeared as the result of treatment. By this time, all the patients were free of seizures, dementia improved in the three patients, and the hemiparesis improved in eight. One of the patients with residual hemiparesis had an old lacunar infarct, and the other had a large cyst located at the sylvian fissure that did not change in size

after albendazole therapy. Finally, the patient with diminution of visual acuity due to optic atrophy did not improve despite disappearance of the cyst.

Patients whose CT showed reduction in the size of the cysts were further evaluated with CT every three months until the lesions disappeared. Such resolution was achieved from six to 12 months after treatment (figure). The three cysts that did not respond to albendazole were in three different patients, and included one small cyst over the convexity of the cerebral hemispheres, one small cyst at the ambiens cistern, and one large cyst at the sylvian fissure. The patient with the large cyst was referred for surgical resection of the lesion because of progressive hemiparesis, and the other two patients received a second trial with albendazole. Further follow up with CT showed persistence of both cysts after the second course of treatment. Long term follow up (mean 22.78 (SD 7.14) months, range 12 to 36 months) was possible in nine patients. Six of these patients remained asymptomatic. One patient had a relapse of seizures related to voluntary withdrawal of antiepileptic drugs, one patient developed recurrent hydrocephalus due to shunt dysfunction, and the other patient died at home 12 months after the trial from unknown reasons.

Discussion

This study shows that albendazole is effective for treatment of subarachnoid cysticerci. The drug caused disappearance of 27 (90%) of 30 cysts after a course of treatment. Fourteen (82%) patients had total resolution of all cysts. Resolution of the cysts was associated with clinical improvement in 14 (82%) patients. These results agree with that found in patients with parenchymal neurocysticercosis, in whom the use of cysticidal drugs results not only in resolution of the lesions on neuroimaging studies, but in better clinical outcomes.^{1,2}

Albendazole was not associated with severe side effects. Although 10 patients had headaches during the treatment, this com-

plaint resolved with the use of analgesics in most patients. Also, the transient worsening of the motor deficit experienced by three patients improved spontaneously in every case. We had no patient with permanent neurological sequelae related to the use of albendazole. However, we gave corticosteroids to all patients to ameliorate the inflammatory reaction around dying cysts. Such reaction may cause a cerebral infarction due to occlusion of a subarachnoid blood vessel located in the neighbourhood of the cyst.^{2,4}

Eleven (37%) of the 30 subarachnoid cysts included in this series measured 50 mm or more. Giant cysts may not disappear three months after treatment even if successfully attacked by the drug.⁴ Ten of the 11 giant cysts included in this series responded to albendazole, but only five of them disappeared within three months. The other five cysts disappeared on further follow up, suggesting that reduction in the size of a giant cyst at three months is a reliable sign of drug effectiveness (figure).

Albendazole was effective and safe in this series of patients with subarachnoid cysticerci, suggesting that the prognosis of such patients is not as poor as was previously thought. Further clinical trials to confirm the benefits of albendazole in subarachnoid cysticercosis are warranted.

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