Risk of seizure recurrence in patients with neurocysticercosis:

Carpio A, Hauser WA. (The School of Medicine and Research Institute, University of Cuenca, Ecuador; and GH Sergievsky Center, College of Physicians and Surgeons, Columbia University, New York, USA.) Prognosis for seizure recurrence in patients with newly diagnosed neurocysticercosis. Neurology 2002;59:1730–4.

Summary
This study prospectively assessed the risk of seizure recurrence in 77 consecutive patients after a first seizure due to neurocysticercosis. Seizure recurrence was defined as any seizure occurring more than 1 week after the index seizure. The diagnosis of neurocysticercosis was based on the following computed tomography (CT) criteria: (i) one or more active parenchymal cysts; (ii) one or more transitional or degenerative parenchymal cysts; (iii) one or multiple calcifications associated with one or more active cysts with or without transitional or degenerative cysts; (iv) any of the above descriptions associated with the extraparenchymal forms. Patient recruitments were done between August 1994 and August 1998 and the study was terminated in August 2001. All the patients received prednisolone (1 mg/kg/day for 8 days after which it was tapered off in the next 8 days) along with antiepileptic drugs (either phenytoin or carbamazepine). Depending upon the preference of the neurologist on duty, 44 patients were administered albendazole (15 mg/kg/day for 8 days) on a non-random basis. All patients were followed up at 2-monthly intervals, preferably by means of clinical interviews. Alternatively, they were contacted by telephone or home visits were made. All patients were followed until seizure recurrence or until termination of the study. After inclusion, if a patient had no further seizure for 1 year, antiepileptic drugs were withdrawn over a 1-month period. If seizures recurred, antiepileptic drugs were restarted. In 72 patients follow up CT scans were obtained between 6 and 12 months after the first CT scan. The mean follow up of the 77 patients was 24 months (median 15 months).

The results were displayed as Kaplan–Meier survival curves with the cumulative probability of seizure recurrence plotted as a function of time after the first seizure. Thirty-one patients (40.3%) developed a seizure recurrence and the cumulative estimate of seizure recurrence for all patients was 22% at 6 months, 32% at 12 months, 39% at 24 months and 49% at 48 and 84 months. Among the 46 patients who remained seizure-free for 1 year and had the antiepileptic drugs withdrawn with a subsequent 1 year follow up, 8 patients had a seizure recurrence. The estimate of cumulative seizure recurrence in these patients, based upon Kaplan–Meier analysis, was 18%. Out of the 31 patients who had a seizure recurrence, 16 (52%) had a third seizure during the follow up period. Results from the Kaplan–Meier analysis demonstrated the estimates of recurrence from the second seizure to the third to be 23% in 6 months, 27% within 12 months, 42% within 24 months, and 68% within 48 and 84 months. Multivariate analysis revealed that gender, seizure type, classification of neurocysticercosis, localization of cysts, Todd paralysis, neurological deficit at presentation and electroencephalographic abnormalities did not predict seizure recurrence. Also, albendazole treatment did not influence the risk of seizure recurrence. The only factor found to be predictive of seizure recurrence was persistence of CT abnormalities. Seizure recurrence was observed in 22% of patients in whom the cysts disappeared, in 56% of patients with persistent cysts (p>0.05) and in 52% of those with calcifications alone.

The authors estimated that about 50% of patients will experience a seizure recurrence in the 7-year period following the first seizure with almost half the recurrences occurring in the first year. The risk of seizure recurrence appeared to be related to the persistence of active lesions. On the basis of these observations, the authors suggested that patients with neurocysticercosis should receive anti-epileptic therapy until the acute lesions clear on CT.

Comment
Neurocysticercosis is the most important cause of acquired epilepsy in developing countries, and it is frequently seen in immigrant populations in developed nations. Reports suggest that approximately 70%-90% of patients with neurocysticercosis have seizures as the dominant symptom. Carpio suggested that the seizures associated with neurocysticercosis could be classified as either ‘acute symptomatic’ or ‘remote symptomatic’ seizures. Patients with acute inflammatory lesions (Carpio et al.2 refer to these lesions as a transitional form or degenerative phase) develop acute symptomatic seizures due to an acute inflammatory reaction in the cyst wall and neighbouring brain parenchyma. Patients with calcified lesions...
have chronic recurrent seizures and are classified as remote symptomatic seizures. Seizures in the inactive or calcified form have been attributed to residual perilesional gliosis that result in chronic epileptogenic foci. At present, there is no agreement on the likelihood for further seizures in patients with neurocysticercosis. Some authors had earlier suggested that control of seizures in patients with neurocysticercosis was better after a course of anticysticercal drugs than when the disease was left untreated. These authors even claimed that the chances of remaining seizure-free after withdrawal of antiepileptic drugs was greater in those patients who were previously treated with anticysticercal drugs.3,4 However, this study by Carpio and Hauser suggested no correlation between treatment with anticysticercal drugs and seizure recurrence. The authors further noted that the changes in CT findings over time were similar, irrespective of whether anti-cysticercal treatment was given or not. Previous data on untreated neurocysticercosis indicated that some of the cysticercal lesions resolve or calcify over time.5,6 In a study on children, it was observed that up to 55% of individual cysticercal lesions may spontaneously disappear.9 Another point about anticysticercal therapy that needs consideration is the ideal duration of treatment with albendazole. Carpio and Hauser gave albendazole for 8 days and in an Indian series with single enhancing CT lesions albendazole given for 7 days did not hasten the resolution of CT lesions.7 On the contrary, in a double-blind study in children, Baranwal et al. observed a significantly faster and higher incidence of complete disappearance of lesions in patients who received albendazole for 4 weeks.8 It is possible that the duration of treatment with albendazole in the present series (also having single degenerative cysticercal lesions in a majority) was not enough to produce the desired response.

The data in this report suggest that there were two categories of patients—those with a single transitional cyst (60%) and multiple lesions of different types of cysticercal lesions (40%). The phenomenon of spontaneous resolution and disappearance is well documented in Indian patients with single enhancing CT lesions (Carpio and Hauser referred to these lesions as single transitional lesion). Further, several reports from India also suggested that seizures ceased to recur after single CT lesions had disappeared spontaneously.9,10 The concluding remark of Carpio and Hauser, that patients with acute neurocysticercosis should be treated with antiepileptic drugs until cyst resolution on CT, is consistent with Indian observations on single enhancing CT lesions. The overwhelming majority of patients in this study had single enhancing lesions. It is not clear from the data provided how many patients with multiple lesions go on to develop normal CT scans. It would also be interesting to find the difference in prognosis of seizures between patients having single degenerating cysts and those with multiple lesions.

Carpio and Hauser have not given the reasons for seizure recurrence in patients who showed complete cyst disappearance and normal follow up CT scans. Pradhan et al. demonstrated that perilesional gliosis, observed with the help of magnetization transfer magnetic resonance imaging, could be the reason for poor seizure control and a significantly higher incidence of seizure recurrence (19 of 22 patients compared with 9 of 86 patients who did not have gliosis).11 Calcific transformation of inflammatory lesions may also be associated with a higher risk of seizure recurrence. The duration of antiepileptic treatment in patients with lesional calcification or perilesional gliosis is also not known.

In conclusion, the findings of Carpio and Hauser confirm the Indian observations in relation to single-enhancing CT lesions that antiepileptic drugs may be withdrawn after a CT lesion has disappeared. However, the management of patients with multiple cysticercal lesions remains a problem. A larger parasitic load is more likely to produce permanent cerebral sequelae in the form of lesional calcification and perilesional gliosis, and possibly a lifelong risk of seizure recurrence.

REFERENCES


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