Special Issue Article

Neurocysticercosis: declining incidence among patients admitted to a large public hospital in Guayaquil, Ecuador

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It has been stated that new cases of neurocysticercosis (NCC) are declining in some endemic regions over the past years. To confirm this assertion, we evaluated all NCC patients (n=362) admitted to the Neurological Service of our Hospital from 1982 to 2011, and we noted a significant reduction in the incidence of NCC, when compared with the total number of patients admitted to the Service over the study years (6.4% of 2,723 patients from 1982 to 1991, 2.7% of 3,056 patients from 1992 to 2001, and 3.5% of 2,996 patients from 2002 to 2012; $p < 0.0001$). It is likely that improved sanitation, together with increased availability of neuroimaging machines which allow prompt recognition and management of NCC cases avoiding disease progression, were the main responsibles for our findings.

Keywords: Cysticercosis, Neurocysticercosis, Neurocysticercosis, Incidence, Guayaquil

It has been suggested that the widespread use of cysticidal drugs, together with improved sanitation, has caused a decreasing prevalence of neurocysticercosis (NCC) in some developing countries.[1–6] We review our NCC patients evaluated over 30 years to confirm these findings.

From January 1982 to December 2011, 362 patients with newly diagnosed NCC (mean age 45.2 ± 13.1 years; 76% men) were admitted to the Hospital Regional Teodoro Maldonado Carbo, Guayaquil, Ecuador. Our Institution is the second largest public hospital in the city, serving adults affiliated to the Social Security System. Patients were admitted if they presented immediatly after a seizure episode, if they were candidates for receiving cysticidal drugs, or if they had intracranial hypertension or neurological deficits. The same admission criteria were applied during the 30 years, and all patients were evaluated by the same neurologist (TAA), making our population homogeneous over the study years.

In all cases, the diagnosis was established using current diagnostic criteria for NCC.[7] Patients with parenchymal, subarachnoid, or ventricular cystic lesions were considered to have active NCC, and those with calcifications alone as well as with chronic arachnoiditis were classified as inactive NCC.[8]

Patients were classified according to the 10-year period in which they were first seen. There were no significant differences in the pattern of disease expression over the years (Table 1). Most common clinical manifestations were seizures in 285 (79%) and headache in 64 (19%) patients. Intracranial hypertension was noted in 66% of patients with headache. A total of 299 (83%) patients had active and 63 (17%) had inactive NCC. The most common location of cysticerci was the brain parenchyma (313 patients), followed by the subarachnoid space (15 patients) and the ventricular system (two patients). The remaining 32 patients had mixed forms of the disease. A total of 331 patients underwent medical treatment (with cysticidal drugs or symptomatic for patients with calcifications); of these, only two patients died and the rest were discharged home. The remaining 31 patients were referred to the Service of Neurosurgery for shunt placements or excision of large cystic lesions.

The 362 patients represented the 4.1% of 8775 patients admitted to the Service of Neurology during this 30-year period. One hundred seventy-five patients were seen between 1982 and 1991, 83 from 1992 and 2001, and 104 from 2002 to 2012. They represented the 6.4% of 2723 patients admitted from 1982 to 1991, the 2.7% of 3056 patients admitted

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Table 1 Pattern of disease expression in 362 patients with neurocysticercosis (NCC) according to the decade in which they were evaluated

	Total series (n=362)	1982–1991 (n=175)	1992–2001 (n=83)	2002–2011 (n=104)	Significance
NCC prevalence	4.1%	6.4%	2.7%	3.5%	P<0.0001
Active NCC	83%	82%	78%	87%	P=0.333 (ns)
Parenchymal NCC	86%	85%	92%	86%	P=0.294 (ns)
Good outcome	91%	88%	96%	91%	P=0.09 (ns)

from 1992 to 2001, and the 3.5% of 2996 patients admitted from 2002 to 2012. Statistical analyisis showed a significant reduction in NCC incidence over the study years (x^2=55.05; P<0.0001), which was mainly related to a drop in the number of patients evaluated from 1992 on.

Our results from a large public hospital were in accordance with other reports from Guayaquil[5,6] and provide further support to the concept that NCC incidence has been declining over the past decades in our city. Such a decline could be related to an increased number of houses with piped water and proper sewage disposal, and to the increased availability of neuroimaging machines which allow recognition of NCC cases by general physicians who can start proper therapy, avoiding disease progression. These encouraging findings have not exclusively noted in Guayaquil, but also in some Mexican urban centers, and at the rural level, in Honduras.[2–4]

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