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Prevalence, incidence and risk factors of epilepsy in older children in rural Kenya

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Summary

Background: There is little data on the burden or causes of epilepsy in developing countries, particularly in children living in sub-Saharan Africa.
Methods: We conducted two surveys to estimate the prevalence, incidence and risk factors of epilepsy in children in a rural district of Kenya. All children born between 1991 and 1995 were screened with a questionnaire in 2001 and 2003, and those with a positive response were then assessed for epilepsy by a clinician. Active epilepsy was defined as two or more unprovoked seizures with one in the last year.
Results: In the first survey 10,218 children were identified from a census, of whom 110 had epilepsy. The adjusted prevalence estimates of lifetime and active epilepsy were 41/1000 (95% CI: 31—51) and 11/1000 (95% CI: 5—15), respectively. Overall two-thirds of children had either generalized tonic-clonic and/or secondary generalized seizures. A positive history of febrile seizures (OR = 3.01; 95% CI: 1.50—6.01) and family history of epilepsy (OR = 2.55; 95% CI: 1.19—5.46) were important risk factors for active epilepsy. After the second survey, 39 children from the same birth cohort with previously undiagnosed epilepsy were identified, thus the incidence rate of active epilepsy is 187 per 100,000 per year (95% CI: 133—256) in children aged 6—12 years.
Conclusions: There is a considerable burden of epilepsy in older children living in this area of rural Kenya, with a family history of seizures and a history of febrile seizures identified as risk factors for developing epilepsy.

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Introduction

Epilepsy is the most common neurological disorder in resource-poor countries (RPCs).[1] The World Bank identified epilepsy as a health priority for school age children because of its' high psychosocial morbidity and the potential for control using low cost interventions.[2] The World Health Organization estimates that there are over 50 million people with epilepsy, of whom two-thirds are children living in RPCs and one-fifth in sub-Saharan Africa; but there is little data on which to base this estimate.[1,3] Furthermore, there is even less data on incidence and risk factors associated with epilepsy in children, on which to plan public health interventions.

We have conducted two studies on children to determine the prevalence, incidence and risk factors for the development of epilepsy in older children living in a rural area of sub-Saharan Africa.

Methods

Study setting

This study was conducted in a demarcated area in Kilifi District on the coast of Kenya. The area was mapped in 2000 and is described elsewhere.[4] The maps were used to locate each household during a census in October 2000 in which the cohort population was defined. The population in this area has been undergoing active surveillance since 2000.

Population

The study population consisted of children born from 01/06/1991 to 31/12/1995, who were identified from the population database of 108,896 people, resident in the study area for at least 6 months preceding the first survey. The population consists of the Mijikenda ethnic group, in which the Giriama sub-group predominates.

Study design and methods

The first survey was conducted from June 2001 to April 2002 as part of a survey of neurological impairment and disability,[5] in which parents or guardians of all the children born from 1991 to 1995 and residing in the study area were interviewed by fieldworkers using the ten questions questionnaire (TQQ).[6] This questionnaire includes a single question enquiring about convulsions: "Does the child sometimes have fits, become rigid, or lose consciousness?" This question was found to have a sensitivity rate of 100% and specificity rate of 93% for moderate or severe lifetime and active convulsive epilepsy (ACE), defined as convulsions occurring at least once a month.[4] Children aged over 6 years were selected for this survey due to the difficulty in differentiating between febrile and unprovoked seizures in younger children and because by this age, most postnatal insults (particularly central nervous system infections) will have occurred.

The second survey was conducted from September 2003 to January 2004, as part of a larger survey of epilepsy in people of all ages (Edwards et al., in preparation). In this survey, a three-phase approach was utilized to identify individuals with convulsive epilepsy. In phase one, a responsible respondent in each homestead was used to identify possible epilepsy cases with the question: Is there anybody in the household who has fits or has been told that they have fits? In phase two, individuals who were identified as positive in the first stage or their parents/guardians had a detailed epilepsy symptoms questionnaire administered to them, to determine those with possible ACE to be invited for detailed assessment.

Individuals identified as having epilepsy in phase two of the second survey had a detailed assessment performed by a clinician to determine if they had seizures. Epilepsy was diagnosed from the history. A 30-min electroencephalogram (EEG), with hyperventilation and photostimulation was performed to help classify the type of epilepsy. Seizures were classified according to the International League against Epilepsy.[7] Active convulsive epilepsy was defined as more than one unprovoked convulsion, with at least one having occurred within the preceding 12 months, since this is the criteria for the administration of anti-epileptic drugs (AED) in Kenya.[8,9]

All the children seen in phase two of the first survey (2001–2002) also had assessments of cognition, vision, motor and hearing to determine impairments associated with epilepsy. Only those with moderate or severe impairments were included in the report.[5] Motor impairment was evaluated through physical examination, while cognitive assessment involved a seven-item battery testing verbal and non-verbal skills.[5] The Sonksen-Silver acuity system was used to measure visual acuity, hearing was measured using the Kamplex screening audiometer.[5] All the assessments were performed within 1 week of identification. In addition, information was also collected on the previous and current use of AEDs for individuals with ACE. This information was used to estimate the treatment gap, defined as the difference between the number of people with ACE and those who reported not receiving AED in a given population at a given point