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Factors associated with behavioral problems and cognitive impairment in children with epilepsy of Kinshasa, Democratic Republic of the Congo

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ABSTRACT

Background: Behavioral problems and cognitive impairment are common in children with epilepsy (CWE). In sub-Saharan Africa, little is known about these comorbidities particularly their relationships with socioeconomic features. The goal of this study was to identify clinical and socioeconomic factors associated with behavioral problems and cognitive impairment in CWE of Kinshasa (Democratic Republic of the Congo).
Methods: This cross-sectional hospital-based study had included 104 CWE aged 6 to 17 years. Behavioral problems were assessed by the child behavior checklist. The Wechsler nonverbal scale of ability was used to assess cognitive impairment.
Results: At least one behavioral problem was found in 34.6% of CWE. Internalized problems were increasing with father's age ($p = 0.034$). Externalized problems were increasing with the decreased of mother's age ($p = 0.009$) and with a previous antiepileptic treatment ($p = 0.032$). Total behavioral problems were increasing with a previous antiepileptic treatment ($p = 0.029$). Cognitive impairment was present in 73.3% of CWE. It was more common in boys ($p = 0.013$), and it was increasing with a low household daily expenses ($p = 0.034$), with a previous antiepileptic treatment ($p = 0.041$), with an early onset of epileptic seizures ($p = 0.042$), and with a high frequency of epileptic seizures ($p = 0.011$).
Conclusion: Behavioral problems and cognitive impairment are common in CWE. Multivariate analysis has shown that behavioral problems were associated with socioeconomic features only. Contrariwise, cognitive impairment was associated with both socioeconomic factors and clinical features. There is a need of more studies to improve knowledge of these comorbidities in the sub-Saharan Africa context.

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1. Introduction

Psychopathological disorders and cognitive impairment are common in children with epilepsy (CWE). Psychopathological disorders, including psychiatric disorders, behavioral problems, and emotional problems, may affect up to three-quarters of CWE [1–2]. Cognitive impairment may affect one-third of CWE [3]. These disorders are more common in CWE than in children without epilepsy [1,4].

In developed countries, psychopathological disorders and cognitive impairment are the subject of numerous publications. In sub-Saharan Africa, very few studies have been devoted to behavioral disorders [5–9] and/or to cognitive impairment [5–6,10–14] in CWE. These sub-Saharan Africa researches have been focused primarily on the relationship between these disorders and the clinical characteristics of epilepsy. Relationships between these disorders and socioeconomic aspects specifics to the sub-Saharan Africa are rarely addressed [6]. However, sociocultural and economic features may have an influence on both the epilepsy and the behavioral disorders and cognitive impairment.

To our knowledge, in the Democratic Republic of the Congo (DRC) as elsewhere in the rest of Central Africa, no study has been conducted on behavioral problems or on cognitive impairment in CWE. This article is

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the first of two studies that integrate socioeconomic conditions and the care pathway of the CWE in Kinshasa (capital of DRC). The goal of this first study was to identify clinical and socioeconomic factors associated with behavioral problems and cognitive impairment in CWE of Kinshasa.

2. Participants and methods

2.1. Site and period of the study

This research was conducted from April to May 2013 and from November to December 2013. The Centre de Santé Mentale Telema (CSMT), a mental health center of the primary level of the DRC's care system, was the site of the study. This health facility is devoted to cares of neurological and psychiatric diseases of outpatients. The CSMT works daily with four or five nurses who provide consultations based on guidelines. A neuropsychiatrist (in DRC, the training in neurology and psychiatry is combined) is reachable at any time, and once a week, he conducts consultations of patients referred by nurses. The CSMT has two video-electroencephalograms (video-EEGs). The EEG protocols are made by the neuropsychiatrist.

In terms of attendance and infrastructure, the CSMT is the most important of the scarce mental health centers of Kinshasa (capital of the DRC). This city has more than 6 million inhabitants with an average income per capita of 1 United States dollar (USD) per day. Kinshasa has only one hospital that has both a department of neurology and a department of psychiatry, the Centre Neuro-Psychopathologique de l'Université de Kinshasa (Neuro-Psychopathological Centre of the University of Kinshasa). Besides these two structures, there are nearly a dozen of neurological-psychiatric private clinics with a capacity of 10 to 20 beds. The CSMT plays an important role in the field of mental health because it performs more than 30,000 consultations each year. Price of the consultation is accessible to almost every budget: 5 USD for the first consultation and 2.5 USD for the ulterior consultations. The EEG is performed at a cost of 20 USD for patients treated to CSMT and 30 USD for others. In comparison, in the other neurological-psychiatric clinics of Kinshasa, the price of each consultation usually varies between 15 USD and 50 USD, and the EEG between 20 USD and 80 USD.

2.2. Participants

Children aged 6 to 17 years with active epilepsy were included by a convenience sampling on their arrival at the CSMT. Epilepsy was defined as the occurrence of at least two unprovoked epileptic seizures separated by an interval of at least 24 h [15]. Epilepsy was active when at least one epileptic seizure had occurred in the last 5 years [15]. Epileptic seizures were classified according to the recommendations of the International League against Epilepsy [16]. The diagnosis of epilepsy was established on the basis of the clinical history told by an eyewitness of the seizures.

2.3. Assessment of behavioral problems

The French version of the Child Behavior Checklist (CBCL) for children aged 6 to 18 years was used to assess behavioral problems. This scale has been used in many different cultural contexts. It was especially used in a study in Uganda [17], a bordering country of DRC. As in that study [17], a team formed by two authors and two French–Lingala interpreter–translator provided translation of the scale in Lingala, the main language spoken in Kinshasa. All members of this team have Lingala and French as mother tongues. The CBCL translated was completed by the first author working with one adult who was accompanying the CWE.

The parents' version of the CBCL used includes 113 items that help to diagnose eight behavioral problems: anxiety/depression, withdrawal/depression, somatic problems, social problems, problems of thought, attention problems, rules-breaking, and aggressive behavior. These behavioral problems can be grouped in the internalized problems (anxiety/depression, withdrawal/depression, and somatic complaints) and the externalized problems (rules-breaking and aggressive behavior). Total problem behavior evaluates overall behavioral problems. The clinical threshold of the CBCL was chosen as the cutoff to define the existence both of a behavioral problem (T score > 69) and of the different syndromic groupings (T score > 63).

2.4. Assessment of cognitive impairment

A psychologist blind of clinical data has assessed cognitive performance by using the short version (two subtests) of the Wechsler Nonverbal (WNV) scale of ability. This test was designed, among others, for children of non-Western culture. The nonverbal nature of this test, the short duration of its administration, and the results in our daily practice have guided its choice. A score below 70 in the total scale was considered as a cognitive impairment. Similarly, the inability to perform the tasks of WNV coupled with suggestive clinical observation of mental disability was considered as a cognitive impairment. Test was postponed for children who have a seizure the day before or the day of the test.

2.5. Neurological impairment

Pyramidal syndrome was synonym of a neurological impairment. Results of neurological examination of CWE that had presented a seizure the day of inclusion were not recorded. In this case, a further meeting was proposed.

2.6. Other variables

Sociodemographic variables had included age, gender, religion, father's age, mother's age, household size, and an estimation of the amount of money (equivalent in USD) usually spent on the daily needs of the household in which the child lives most often.

Epilepsy variables had included age of epilepsy onset, duration of epilepsy, type of seizures, seizures frequency (<2 seizures per month versus ≥2 seizures per month), and type of antiepileptic treatments before the first consultation to the CSMT. Depending on the previous type of treatment, the CWE were divided into two groups: (1) CWE not

Table 1
General characteristics of CWE.

Variable	n (%) or mean ± SD
Age (year)	12.0 ± 3.2
Girls	43 (41.3%)
Age of fathers (year), $n = 91$	48.9 ± 8.0
Age of mothers (year), $n = 97$	41.5 ± 7.0
Household size, $n = 102$	7.2 ± 2.8
Household daily expenses (USD), $n = 98$	8.04 ± 4.15
Daily expenses per person (USD), $n = 98$	1.24 ± 0.72
Age of onset (year)	6.9 ± 4.1
Duration of epilepsy (year)	5.1 ± 4.2
≥2 seizures/month, $n = 103$	59 (57.3%)
Seizure types	
Generalized	35 (33.6%)
Focal	58 (55.8%)
Epileptic spasms	3 (2.9%)
Unclassified (due to lack of information)	8 (7.7%)
Prior antiepileptic treatment, $n = 102$	
None	45 (44.1%)
AED	14 (13.7%)
AED and Traditional	13 (12.8%)
Traditional	30 (29.4%)
Neurological impairment, $n = 98$	12 (12.2%)

AED, antiepileptic drug; USD, United States dollar.

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