

Pediatric Cerebral Palsy in Africa: A Systematic Review

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Cerebral palsy is a common neurologic problem in children and is reported as occurring in approximately 2-2.5 of 1000 live births globally. As is the case with many pediatric neurologic conditions, very little has been reported on this condition in the African context. Resource-limited settings such as those found across the continent are likely to result in a different spectrum of etiologies, prevalence, severity as well as management approaches. This review aims to establish what has been reported on this condition from the African continent so as to better define key clinical and research questions.

Semin Pediatr Neurol 21:30-35 © 2014 Elsevier Inc. All rights reserved.

Introduction

The term cerebral palsy (CP) describes a group of permanent disorders of the development of movement and posture causing activity limitation, which are attributed to nonprogressive disturbances that occurred in the developing fetal or infant brain. It is an umbrella term encompassing a range of different etiologies and phenotypes as well as associated with a variety of comorbid conditions (including epilepsy, intellectual disability, sensory disorders, and behavioral problems).¹ CP is a common neurologic problem in children and is reported as occurring in approximately 2-2.5 of 1000 live births globally.² As is the case with many pediatric neurologic conditions, very little has been reported on this condition in the African context. This review aims to establish what has been reported on this condition from the African continent so as to better define key clinical and research questions.

Methods

We performed a systematic review of available literature to identify data on the prevalence, etiology, comorbidities, outcomes, screening tools, and treatment of CP in Africa. Abstracts from any study from or involving an African country were reviewed for possible inclusion. Studies reporting more general neurodevelopmental disabilities were included only if they specifically mentioned CP as an outcome. Studies that focused on a subgroup of children with CP (eg, premature infants or children with genetic disorders) were excluded.

Search Strategy

Online databases were searched using specific search strategies to identify relevant articles published in English. Ovid Medline, PubMed, and the Cochrane database were searched using combinations of the terms “cerebral palsy,” “Africa,” “developing countries,” “developmental disabilities,” “neurological impairment,” and “childhood disability.” Web sites from African and international disability organizations as well as the World Health Organization were scanned for further references missed through the aforementioned search. The abstracts of any articles identified in this search strategy were screened for relevance, and electronic or hard copies of the full text were obtained for all relevant articles. References from each relevant article were scanned for further relevant articles and a snowballing search was performed. Commercial search engines Google and Bing were then used to check for any missing publications. Additional local journals not on the PubMed database (such as the East African Medical Journal) were searched for relevant articles. For the final analysis, only original research publications published after 1980 were

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included. When multiple publications existed on the same study cohort, only the most recent or most relevant publication was included, and studies were included only if they had some special relevance to the African setting.

Results

We identified 16 publications on prevalence or etiology or both of cerebral palsy in Africa (4 from Nigeria,³⁻⁶ 4 from South Africa,⁷⁻¹⁰ 2 from Ethiopia,^{11,12} Ghana,^{13,14} and Tanzania,^{15,16} and 1 each from Egypt¹⁷ and Kenya¹⁸). A summary of key prevalence and etiology studies is presented in Table 1.

There were 6 studies that examined screening instruments and strategies in an African setting for developmental disabilities including CP.¹⁹⁻²⁴ In addition, 2 articles provided an overview of screening strategies in low-resource settings for neurodevelopmental disabilities including CP.^{25,26}

A total of 4 studies assessed the effect of caring for children with CP on the caregiver,²⁷⁻³⁰ and 10 studies assessed specific aspects of treatment of children with CP³¹⁻³⁶ and comorbidities.³⁷⁻⁴⁰ There were no studies that addressed broad longitudinal outcomes in children with CP in Africa.

Prevalence

Methodologies for determining prevalence varied widely between studies, varying from door-to-door surveys to hospital-based record reviews. Almost all studies were cross-sectional. A common technique was a 2-phase design using the World Health Organization Ten Questions screen administered by a community health worker to identify possible cases followed by confirmation by a clinician.²⁶ Prevalence varied widely from country to country from approximately 2-10 per 1000^{9,25,41} children in community-based samples, although owing to heterogeneity between studies, it is difficult to

attribute this to true differences in prevalence or to differences in methodology (Table 1).

Etiology or Risk Factors

The most common reported etiologies identified in African cohorts were birth asphyxia, kernicterus, and neonatal infections, with prematurity or low birth weight identified as a major etiology in only 2 studies (Table). This is in contrast with most studies in the United States and Europe in which prematurity or low birth weight is one of the major risk factors identified in almost all studies.⁴²

Identification and Classification

Several studies on prevalence attempted to assess the sensitivity and specificity of their screening methodology and found that the Ten Questions Screen followed by clinician confirmation had good sensitivity and reasonable specificity. A study conducted in Uganda and Sri Lanka attempted to develop and validate a screening “portfolio” (short battery of tests) that could be used by community health workers, though the study is limited by minimal information about how the screen was used and did not report sensitivity or specificity.¹⁹ Two studies, one in Malawi (the Malawi Developmental Assessment Tool) and another in Kenya (Kilifi Developmental Inventory), have developed developmental screening tools aimed at identifying children with neurodevelopmental disabilities including CP.^{21,22} A Zimbabwean group described the use of the Neonatal Neurological Examination based on Prechtl’s general movements to identify neonates at risk for developmental disabilities including CP.⁴³

Studies from the African continent published to date have reported a larger proportion of severely affected children or those with Gross Motor Functional Classification System IV

Table Summary of Key Studies Evaluating Prevalence and Etiology of Cerebral Palsy in Africa

Study	Country, Region, and Income Status	Design	Prevalence (per 1000)	Most common Etiologies
El-Tallawy et al ⁴¹	Egypt North Africa Lower middle income	Prospective Community based Cross-sectional	2	Birth asphyxia (34.6%) Preterm birth (17.3%) Kernicterus (15.4%)
Ogunlesi and Ogundeyi ³	Nigeria West Africa Lower middle income	Retrospective Case series Hospital based	Not measured	Birth asphyxia (57.6%) Kernicterus (36.9%) CNS infections (21.7%)
Couper ⁹	South Africa Southern Africa Upper middle income	Prospective Community based Cross-sectional	10	Not reported
Karumuna and Mgone ¹⁵	Tanzania Southern Africa Low income	Prospective Hospital based Cross-sectional	Not measured	Birth asphyxia (36%) Low birth weight (20%) CNS infections (15%)

CNS, central nervous system.

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