Child Neurology in Africa

The World Health Organization estimates that children in low-income countries are 16 times more likely to die before approximately 5 years of age than children in high-income countries (http://apps.who.int/iris/bitstream/10665/82058/1/WHO_HIS_HSI_13.1_eng.pdf). Almost 75% of childhood deaths are caused by just 6 conditions: neonatal causes (preterm birth, asphyxia, and infections), pneumonia, diarrhea, malaria, human immunodeficiency virus (HIV) infection, and measles. Amongst resource-limited nations, the burden is heavily skewed toward Africa, where almost half of these childhood deaths occur. Of the survivors of these conditions, many develop neurologic complications.

This issue addresses key challenges specific to the African continent in the management of children with neurologic diseases—namely, neuroinfections (HIV, tuberculosis [TB], malaria, etc), cerebral palsy, epilepsy, and the effect of malnutrition on the growing brain.

Approximately, 3.4 million children worldwide are affected with HIV, with more than 90% of them residing in sub-Saharan Africa. A significant proportion of the children who are eligible for treatment with antiretroviral therapy are not currently receiving it. However, as the proportion of children with access to antiretroviral therapies increases and they are surviving for longer, a generation of highly dependent adolescents is developing with behavioral issues and failure of executive functioning, who are based in a setting totally unequipped to deal with the magnitude of the problem. The article on HIV in this edition summarizes the spectrum of neurologic complications of HIV in children and focuses on the neurocognitive and behavioral sequelae.

South Africa is one of the 22 high-TB burden countries that account for 80% of the world TB cases. Few African countries are on track to achieve the Millennium Development Goal to halve the 1990 prevalence and death rates by 2015. Tuberculous meningitis (TBM), the most devastating manifestation of TB, is often missed because of nonspecific symptoms and difficulties at diagnosis. It is an important cause of neurologic handicap in resource-poor countries. In the report by van Toorn and Solomons, the authors describe novel approaches to children in Africa, including the role for short, intensified treatment. Early diagnosis and treatment of TBM is the single most important factor determining outcome; as such, the development of affordable, accurate diagnostic tests for TBM in resource-poor settings remains a priority.

Two other articles address viral and parasitic infections of the central nervous system, which are of effect in Africa. They illustrate the challenges of the polio campaign. The tragedy is that many of these infections are avoidable, or could be significantly reduced, with the incorporation of relatively simple preventative measures such as mosquito nets for malaria and pigpens for neurocysticercosis. The section on West Nile virus is fascinating as the spread of this illness to the United States of America has not been fully elucidated, and this illustrates that many conditions that are regarded as African illnesses are not so by any means.

In the article by Donald et al, the most commonly reported etiologies for cerebral palsy 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. This is in contrast to most studies in the United States and Europe in which prematurity and low birth weight are the major risk factors identified in almost all studies. As such, cerebral palsy in children based in resource-limited settings, as those found across the African continent, is likely to be the result of a different spectrum of etiologies, have greater prevalence and severity, and require novel management approaches.

The article on children with epilepsy, who reside in the African continent, reports that they are faced with some of the greatest challenges to receiving adequate care. The burden of disease is exacerbated by the high incidence of acquired causes and the large treatment gap. Skilled teams to identify and care for children with epilepsy are lacking. The stigma associated with the condition is compounded by the management of many patients in psychiatric services. The true proportion of comorbidities that the children with epilepsy are affected is unknown, but it is assumed to be further aggravated by delayed interventions and adverse responses to some of the more commonly used antiepileptic drugs.

Many preventable conditions exist in Africa, where often relatively simple interventions could lead to significant reductions. The article by Kerac et al in this issue addresses the effect of diverse malnutritional states on the neurology of children. Children are at risk of the consequences of
malnutrition throughout life. Maternal malnutrition affects fetal neurodevelopment with both immediate (eg, folate deficiency causing neural tube defects) and lifelong implications (eg, impaired cognitive function). Maternal malnutrition can also increase the risk of perinatal problems including birth asphyxia, a major cause of neurologic damage and cerebral palsy. Macronutrient malnutrition can both cause and be caused by neurodisability. Specific micronutrient deficiencies can also lead to neurodisability, for example, blindness (vitamin A), intractable epilepsy (vitamin B6), and cognitive impairment (iodine and iron). Toxin ingestion (eg, from poorly processed cassava) can cause neurodisability including peripheral polyneuropathy and spastic paraparesis. The authors conclude that there is an urgent need for nutrition and disability programs to work more closely together.

In the article by Gladstone et al, the authors highlight that the interaction of neurodisability and malnutrition is powerful and that both need to be considered when assessing children. Without an integrated approach to assessment and management, they state that it would not support children and families to reach their best potential outcomes. The article addresses the various approaches and screening tools to achieve this in this setting.

In many cases, these issues are novel to Africa. There is often a layering effect from multiple comorbidities. Innovative approaches must be incorporated for resource-poor countries to attempt to meet the challenge of improving health care in these settings. An example is to include a traditional healer as part of the health care team. Training programs that are relevant to African needs have to be developed to equip trained personnel with skills that are relevant to their practice, to initiate research programs aimed at identifying ways to improve outcomes, and to truly understand disease patterns specific to the continent.

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References
2. van Toorn Ronald, Solomons Regan: Update on the diagnosis and management of tuberculous meningitis in children. Semin Pediatr Neurol, in this issue