

Association Between Clinical Seizures and EEG Factors with Neurologic and Neurocognitive Outcomes in Pediatric Cerebral Malaria

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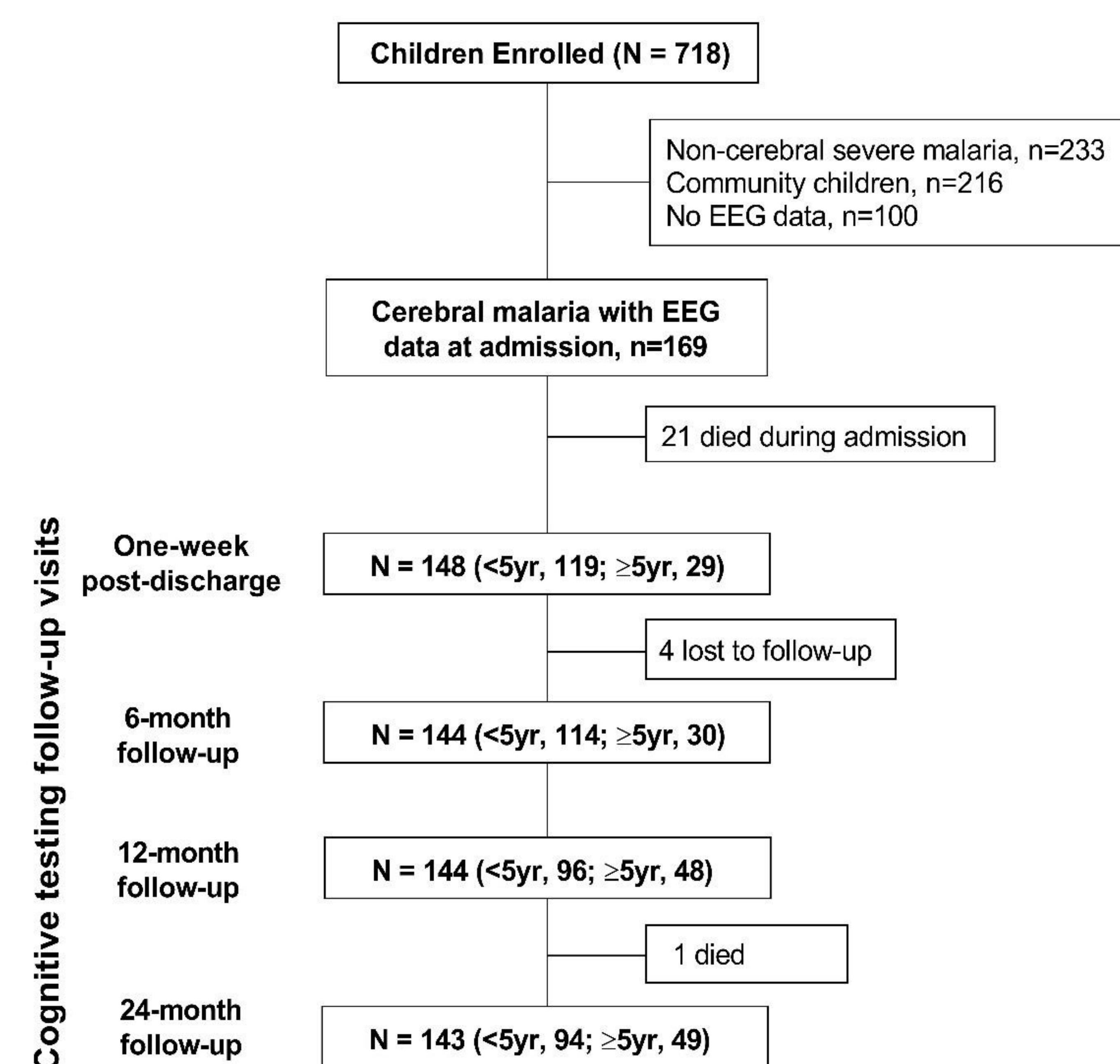
Introduction

Malaria, a communicable disease caused by *Plasmodium* parasites, kills more than 500,000 people annually. While the symptoms of infection vary in severity and presentation, cerebral malaria, defined as an otherwise unexplained coma in someone with *Plasmodium* parasitemia, is the most fatal form. Seeking to supplement a study conducted in Kampala, Uganda on the associations between qualitative EEG factors and long-term cognitive outcomes, this component of the research project primarily involved gathering relevant existent literature on the associations between EEGs and cerebral malaria-outcomes and specifically focused on neurocognitive outcomes.

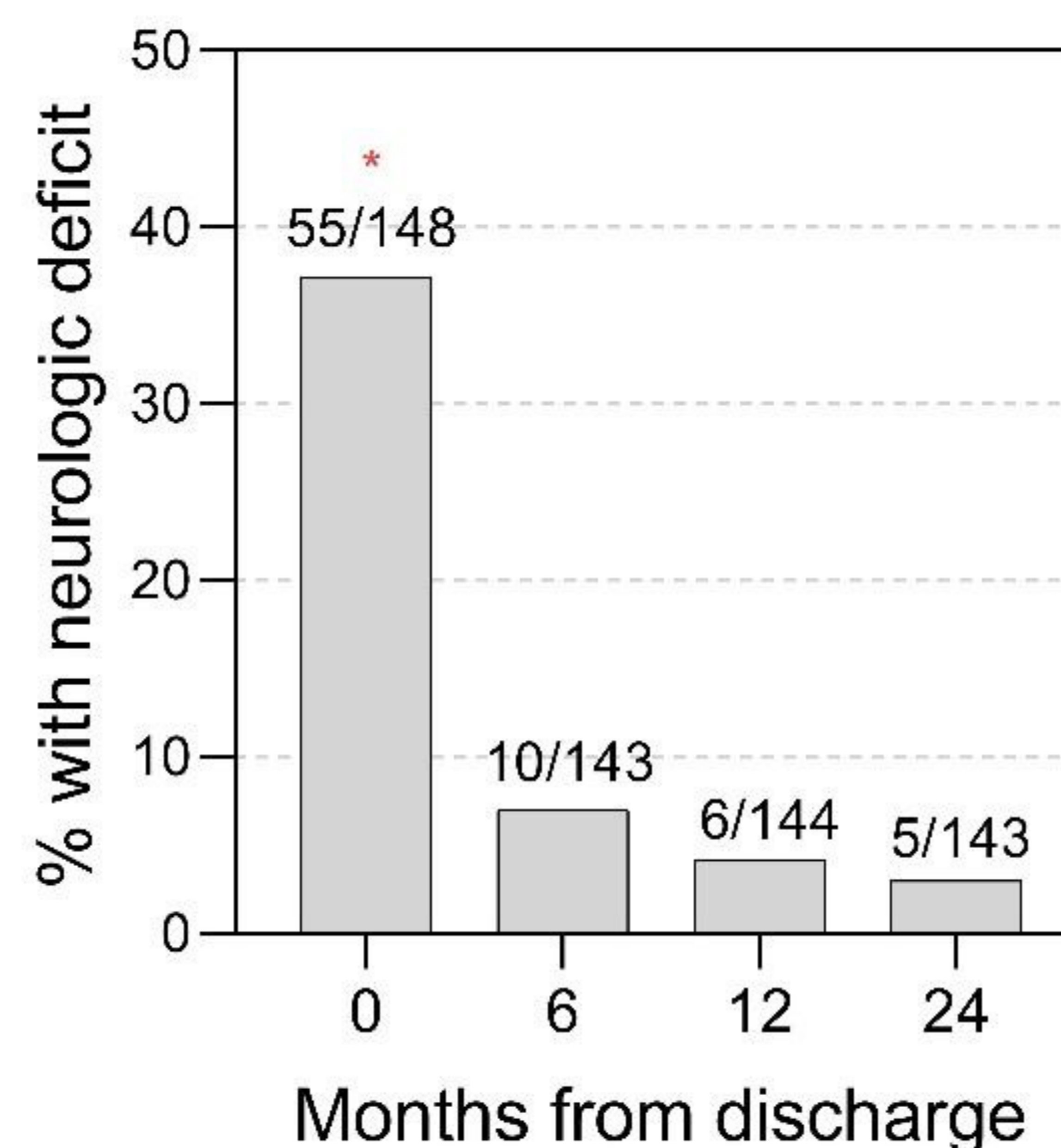
Methods

The Kampala-based research data, collected between 2008 and 2013, included routine-length EEGs in children six months to 12 years with a diagnosis of cerebral malaria as well as physical and neurological examinations and neuro-cognitive testing at time of hospital discharge, one week after discharge, and six, 12, and 24-months later. Given this methodology, the literature review focused on EEGs as predictors of neurodevelopmental outcomes as a result of cerebral malaria. Furthermore, the review extended beyond the scope of cerebral malaria and included background on EEGs as prognostic tools in neurocognitive outcomes in conditions other than malaria. These conditions included sepsis, meningitis, herpes simplex virus, non-traumatic coma, and several additional conditions.

Study Flow Diagram



Neurologic Deficits at Discharge



Results

Qualitative EEG factors were unable to predict short-term adverse neurological outcomes following cerebral malaria, and there have been a limited number of studies examining the predictive power of EEGs for long-term cognitive outcomes. EEGs have been utilized successfully as predictors for long-term neurobehavioral outcomes. In studies of patients with neonatal meningitis, low-voltage background patterns, sleep-wake cycling, and epileptic activity can serve as predictors of poor outcome.

Conclusion

Synthesis of the study conducted in Uganda and the aforementioned review indicates that admission EEG and the presence of clinical seizures are associated with long-term neuropsychological outcomes in children surviving cerebral malaria.

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