Title: Neurocognitive impairment following central nervous system infections in Kenyan children as detected by event related potentials

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Abstract:
As mortality in childhood decreases due to advances in modern medicine, presence of better nutrition and fresh water supply, the impact of disability has become increasingly important especially in resource poor countries. Children living in sub-Saharan Africa are also exposed to a number of potentially debilitating infections which have been shown to have long-term cognitive effects even in absence of clinical neurological sequelae. The objective of the study is to demonstrate that event related potentials (ERPs) can be used to detect neurocognitive impairment following the most common central nervous (CNS) system infections affecting children in sub-Saharan Africa, namely falciparum malaria, acute bacterial meningitis (ABM) and human immune-deficiency virus (HIV). Four groups of children were recruited: children previously admitted with severe falciparum malaria (n=50), or acute bacterial meningitis (n=65), or mY-infected (n=39) or were unexposed to any of these conditions (n=177). Passive auditory and visual oddball ERP protocols were used. The results of the group of 50 children aged 6-7 years old with a history of severe falciparum malaria (cerebral malaria, CM=27, malaria plus seizures, MIS=14 and prostrated malaria, PM=9) show that children exposed to CM, MIS and PM had significantly longer auditory N200 and P3a latencies and smaller N200 amplitudes than study controls. The results of 65 children aged between 4-15 years old with a history of pneumococcal meningitis showed that children with a history of bacterial meningitis had significantly smaller auditory P100 amplitudes, longer N200 latencies and longer visual P200 latencies than community controls. Finally, the results of 40 children aged between 18-40 months infected with HIV showed that they had longer auditory P100 latencies, larger auditory P200 amplitudes and smaller Negative component, Nc, amplitudes than community controls. It is concluded that the CNS infections may result in neuro-developmental delays in childhood. Further, CNS infections may interfere with normal education outcomes by precipitating attention deficit amongst children post infection.