

Poster presentation

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## Cognitive deficits following exposure to malaria with neurological involvement: an event related potentials study

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### Introduction

*Plasmodium falciparum* is the most common parasitic infection of the nervous system. It affects about 500 million people worldwide and causes up to 1 million deaths each year mostly children under 5 years old in Africa. It causes neurological complications which are associated with persisting cognitive deficits in between 5–21% cases. However, a lack of sensitive, culture-fair and robust techniques of data collection in the rural settings prevented accurate estimate of the neuro-cognitive burden of severe malarial disease. We proposed the use of auditory and visual event related potentials (ERPs) as a marker of cognition.

### Methods

Fifty-four children, aged between 6–7 years, who had been hospitalized at Kilifi District Hospital (KDH) with severe forms of falciparum malaria were selected and compared with an equal number of unexposed children selected from the community. We recorded passive auditory and visual event related potentials in each of these children.

### Results

The results showed that children exposed severe falciparum malaria had significantly longer auditory N200 latencies ( $252 \pm 48$  vs  $183 \pm 42$ ,  $p < 0.01$ ) and P3a latency

( $330 \pm 55$  vs  $305 \pm 52$ ,  $p < 0.05$ ) compared to community controls. Children with a history of severe falciparum malaria had smaller P3a amplitudes ( $0.2 \pm 5.9$  vs  $6.2 \pm 7.7$ ,  $p < 0.05$ ) compared to controls. In the visual paradigm, children with a history of malaria plus seizures had significantly smaller P200 amplitudes ( $3.2 \pm 15.8$  vs  $5.5 \pm 7.6$ ,  $p < 0.05$ ) than community controls.

### Conclusion

The results from the ERP tests demonstrate that children with a history of severe falciparum malaria could have slower processing than community controls. The pattern of deficits in cerebral malaria is different from those with malaria plus seizures and prostrated malaria. The results provide further further evidence of deficits in areas of attention, stimulus classification and discrimination and most likely localized to the superior temporal gyrus or prefrontal cortices.