

Malaria infection and the risk of epilepsy: a meta-analysis

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Abstract

Epilepsy, a chronic disease of the central nervous system, is highly prevalent in malaria-endemic regions. Therefore, several studies have evaluated the associations between malaria infection and epilepsy development. A meta-analysis of observational studies published from inception to 10 May 2022 has been conducted to synthesize and pool the existing data on this topic. The relevant publications were systematically searched in PubMed/Medline, Scopus, Embase and Web of Science database collections. A random-effects meta-analysis model (REM) was utilized to generate the pooled odds ratio (OR) at 95% confidence intervals (CIs). The between-studies heterogeneity was assessed with I², as well as several subgroups, meta-regression and sensitivity analysis were performed to identify the source of heterogeneity. Overall, 17 eligible studies containing 6285 cases and 13 909 healthy controls were included. The REM showed a significant positive association between malaria infection and epilepsy development (OR 2.36; 95% CI 1.44–3.88). In subgroup analyses, significant positive associations were observed in studies that: epilepsy was the outcome in the follow-up of patients with cerebral malaria (OR 7.10; 95% CI 3.50–14.38); used blood smear to diagnose malaria (OR 4.80; 95% CI 2.36–9.77); included only children (OR 3.92; 95% CI 1.81–8.50); published before 2010 (OR 6.39; 95% CI 4.25–9.62). Our findings indicated that patients with malaria, especially those with cerebral malaria, are at a high risk of epilepsy development; however, further well-designed and controlled studies are needed to verify the strength of the association.

Keywords: Cerebral malaria, epilepsy, malaria infection, meta-analysis, systematic review