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Malaria co-infections: Causes of fever in paediatric inpatients from Ghana

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Background: . In sub-Saharan regions with holoendemic malaria transmission clinicians primarily focus on malaria diagnostics. Hence, febrile patients with malaria co-infections might receive treatment for non-causative parasitaemia, while the co-infecting agent remains overlooked. This study aims to clarify the role of malaria co-infections among hospitalised children with severe febrile illness to guide treatment decisions.

Material/methods: . Between November 2013 and April 2015 all patients with a temperature $\geq 38.0^{\circ}\text{C}$, admitted to the Agogo Presbyterian Hospital in central Ghana were included in the study. Blood cultures, malaria microscopy as well as bacterial culture and molecular diagnostic tests from urine, pharyngeal swabs, stool and cerebrospinal fluid specimens. Non-febrile, healthy controls were recruited to analyse associations of febrile disease and parasitaemia.

Results: 1,238 children were included into the hospital study. A clinical/microbiological diagnosis could be made in 1,109 (90%) patients, with parasitaemia (n=728; 59%), respiratory tract infections

([RTI] n=467; 34%), gastrointestinal infections (n=210; 17%) and invasive bloodstream infections (n=62; 5%) being predominant. Out of 537 healthy children, 83 (15%) revealed malaria parasites, of which 90% had a parasite count below 12,000/ μ , which was used as a cut-off to define asymptomatic malaria infections. Applying this parasite cut-off to the hospital patients showed that 613 (50%) children had clinical malaria. Among those 319 (52%) had a concomitant diagnoses, such as RTI (n=143; 23%), gastrointestinal infections (n=83; 14%) and invasive bloodstream infection (n=4; 1%).

Conclusions: With half of all malaria patients revealing an alternative cause for the fever episode and 15% of healthy children being parasiteamic, malaria co-infections play a substantial role in the paediatric population of malaria endemic countries. Laboratory capacities must be enhanced to reliably diagnose infectious pathogens beyond malaria.