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Blood Transfusion and Malaria Risk Abstracts

A systematic review and meta-analysis of the risk of transfusion transmitted malaria from blood donors in sub-Saharan Africa

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Introduction:

Transfusion transmitted malaria (TTM) is a major component of global transfusion transmitted infections, however estimates of its incidence are scarce. It is important as it may increase the morbidity and mortality of blood donation recipients, the majority of whom are young children and pregnant women who are often anaemic or suffering from other co-morbidities. It may also jeopardise global malaria elimination efforts by acting as a reservoir for subclinical parasite transmission. This systematic review aims to assess the current prevalence of Plasmodium parasite carriage in blood donors in high-endemic regions in sub-Saharan Africa and to provide estimates of spatial and temporal heterogeneity of TTM risk across Africa.

Methods:

Publication databases and clinical trial registries were searched for articles reporting prevalence studies of malaria parasitaemia amongst blood donors in sub-Saharan Africa (SSA) published between 2000 and 2017. Grey literature sources such as the World Health Organization (WHO) website and individual countries' ministry of health websites were searched for published reports, and reference lists of papers were also screened. Risk of Bias was assessed using the Joanna Briggs Institute Prevalence Critical Appraisal Tool.

Results:

Twenty six studies were included in the meta-analysis (22,508 subjects). This included two studies each from Northern, Eastern and Middle Africa and fourteen studies from Western Africa. Pooled prevalence of malaria parasitaemia was 23.46% (95%CI: 19.74% - 27.19%), ranging from 0.00% to 74.15%.

Discussion and Conclusions:

Prevalence of blood donors carrying Plasmodium remains high in SSA, with large variability between regions. As transmission and immunity wane in Africa this prevalence will likely decrease but the severity of TTM will likely increase, thereby posing a potentially serious threat to recipients, and possibly interfering with elimination efforts.

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Prevalence of Malaria Parasites at the Malabo Blood Bank on Bioko Island, Equatorial Guinea

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Introduction:

Malaria can be transmitted by blood transfusion from human to human and it is responsible for the majority of transfusion transmitted infectious diseases worldwide. The rate of transfusion transmitted malaria (TTM) in sub-Saharan Africa has been estimated between 14-28%. Since RDTs and thick blood smear microscopy lack sensitivity for low level parasitemia, particularly in asymptomatic adults, the most reliable method to assess the problem of TTM are nucleic acid-based molecular approaches such as qPCR.

Methods:

The laboratory infrastructure of the Equatorial Guinea Malaria Vaccine Initiative was used to analyse 200 blood samples collected at the Malabo blood bank for the presence of possibly undetected, low level malaria parasites in the blood donations using high-sensitive qPCR assays.

Results:

A total of 59 blood samples were positive for at least one malaria species (29.5%). *P. falciparum* was the dominating species responsible for 88.1% of positive blood samples, followed by *P. malariae* (15.3%) and *P. ovale* (3.4%). We could not find *P. vivax* and *P. knowlesi*. Our analyses revealed that more than 80% of *P. falciparum* and all *P. malariae* and *P. ovale* cases had less than 100 parasites per microliter blood and are therefore unlikely to be detected by RDTs and microscopy.

Discussion and Conclusions:

Our studies extend previous observations of TTM in Sub-Saharan Africa and demonstrate the power of nucleic acid-based molecular approaches for detection of *P. falciparum*, *P. malariae* and *P. ovale* in this setting

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