

Evidence Assessment: Summary of a Systematic Review

Who is this summary for?

This evidence assessment is for Doctors, Health Personnel, Community Health Workers and the partners involved in the management of malaria.

Oral iron supplements for children in malaria-endemic areas

Key findings

- In areas where health services are sufficient to help prevent and treat malaria, giving iron supplements may reduce clinical malaria. In areas where these services are not available, iron supplementation may reduce the number of children with clinical malaria.
- Overall, iron resulted in fewer anaemic children at follow up, and the end average change in haemoglobin from base line was higher with iron.
- There was no increased risk of death among children treated with iron, although the quality of the evidence for this was low.

Background

Children living in malarial areas commonly develop anaemia. Long-term anaemia is thought to delay a child's development and make children more likely to get infections. In areas where anaemia is common, health providers may give iron to prevent anaemia, but there is a concern amongst researchers that this may increase the risk of malaria. It is thought that the iron tablets will increase iron levels in the blood, and this will promote the growth of the Plasmodium parasite that causes malaria.

Question

What is the effects and safety of iron supplementation, with or without folic acid, in children living in areas with hyperendemic or holoendemic malaria transmission?

Oral iron supplements for children in malaria in Cameroon: Malaria is responsible for 40% of hospitalizations and 18% of all deaths in Cameroon according to the Demographic and Health Survey, 2011. Oral iron supplements are already used for children with malaria in Cameroon.

Table 1: Summary of the systematic review		
	What the review authors searched for	What the review authors found
Studies	Randomised controlled trials (RCTs).	Thirty-five studies cluster-randomised controlled trials were included.
Participants	Children (less than 18 years of age), with or without anaemia, and with or without malaria or parasitaemia at baseline	Children
Interventions	<ul style="list-style-type: none"> • Iron. • Iron plus folic acid. • Iron plus antimalarial treatment. 	Thirty-five assessed the administration of iron or iron plus folic acid for the prevention or treatment of anaemia among children without an acute illness. The mean iron supplementation dose was 2 mg/kg/day, and the mean duration of treatment was 4.5 months (one to 12 months). Twenty-seven trials added antimalarial treatment to the iron arm or both trial arms, 12 trials added anthelmintics to both trial arms, and eight trials added micronutrients to both trial arms. Twenty-three trials reported one or more of the review-defined malaria-related outcomes.
Controls	<ul style="list-style-type: none"> • Placebo. • No treatment. • Antimalarial (only when the intervention is iron plus antimalarial). 	<ul style="list-style-type: none"> • Placebo. • No treatment. • Antimalarial (only when the intervention was iron plus antimalarial).
Outcomes	<p>Primary outcomes</p> <ul style="list-style-type: none"> • Clinical malaria: uncomplicated malaria, defined as a history of fever with parasitological confirmation. • Severe malaria: cerebral malaria or acute Plasmodium falciparum malaria with signs of severity, or evidence of vital organ dysfunction, or both. If it had been defined differently, we extracted the outcome as reported in the trial and used the trial authors' definitions. • Death from any cause. <p>Secondary outcomes</p> <ul style="list-style-type: none"> • Malaria parasitaemia; any level of parasitaemia, and above a specific threshold as used in the study to define high-grade parasitaemia. • Malaria parasite density, as reported in the included trial. • Hospitalizations for any cause. • Clinic visits. • Haemoglobin levels. • Prevalence of anaemia, as defined in the trial. • Infections other than malaria (including diarrhea, pneumonia, sepsis, meningitis, measles, and pertussis), expressed as episodes per child-month. 	The outcomes reported were: <ul style="list-style-type: none"> • Clinical and severe malaria; • Deaths; • Clinical and severe malaria • Clinical malaria • Parasite prevalence and density;

	<ul style="list-style-type: none"> • Weight, absolute values. • Height, absolute values. 	
Date of the most recent search: 30 August 2015.		
Limitations: This is a high quality systematic review, AMSTAR =11/11		
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Table 2: Summary of findings

Does iron supplementation or fortification increase malaria and related morbidity and mortality among children in malaria-endemic areas?			
Population: Children in malaria-endemic areas			
Settings: Areas which are malaria- endemic, and where children may benefit from iron treatment.			
Intervention: Iron			
Comparison: Placebo or no treatment			
Outcomes	Relative effect 95% CI	No of Participants (studies)	Quality of the evidence (GRADE)
Reduction in clinical malaria	0.93 [0.87-1.00]	7168 (14)	High
Anaemic at baseline	0.92 [0.84-1.00]	7168 (14)	Moderate
Not anaemic at baseline	0.97 [0.86 -1.09]	2112 (5)	Moderate
Severe malaria	0.90 [0.8-0.98]	3421 (6)	High
Death	Not estimated	7576 (6)	Low
Hospitalisation plus clinical visits	0.99 [0.95-1.04]	12578 (6)	Very low

Applicability

Of the 35 studies, six were conducted in Kenya, six in Zanzibar, five in Gambia, three in Togo, two in Benin, and one each in Nigeria, Malawi, Cambodia, Papua New Guinean, Cote d'Ivoire, Tanzania. These interventions may be applied in other low resources settings such as Cameroon.

Conclusions

Iron supplementation does not adversely affect children living in malaria-endemic areas. Routine iron supplementation should not be withheld from children living in countries where malaria is prevalent and malaria management services are available.

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