Artesunate combination will lower the incidence of Plasmodium falciparum
for 200,000 Gambian (2011)


1. Temperature monitoring of children with fever, measurements of temperature
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Artemether

Artsenate

Quinine

Qinghaosu

Cinchona bark

Meta-analysis

Meta-analysis Study Group

Artemether-Quinine

Artesunate Malaria Trial

SEAQUAMAT Study

Artemisinin

Severe malaria
In both studies, baseline characteristics were similar, with a comparable number of patients in each group. In the SEAQUAMAT study, 1,461 patients (730 with Quinine and 731 with Artesunate) were enrolled, while in the AQUAMAT study, 5,425 patients (2,712 with Artesunate and 2,713 with Quinine) were enrolled. The proportion of patients with a fever of 38°C or higher at baseline was 15% in the Quinine group and 22% in the Artesunate group (95% CI: 18.5–47.6%, P = 0.0002). A relative risk of 3.2 (95% CI: 3.0–7.8, P = 0.009) was observed, indicating a higher risk of fever in the Artesunate group. A multi-organ failure syndrome (pneumonia, 34.7% reduction in 18.5–47.6%; P = 0.001) was observed more frequently in the Artesunate group (Ratio of ORs = 0.34, 0.17–0.69). In the AQUAMAT study, the proportion of patients with fever of 38°C or higher was 8.5% (230/2,712) in the Quinine group and 20% (542/2,712) in the Artesunate group (95% CI: 17.5–23.4%, P = 0.0002). A relative risk of 3.2 (95% CI: 3.0–7.8, P = 0.009) was observed, indicating a higher risk of fever in the Artesunate group. A multi-organ failure syndrome (pneumonia, multi-organ failure, vasopressor, 34.7% reduction) was observed more frequently in the Artesunate group (Ratio of ORs = 0.34, 0.17–0.69, P = 0.001). A similar pattern was observed in the AQUAMAT study.
Meta-analysis

Meta-analysis is a statistical method used to combine the results of multiple studies to provide a more precise estimate of the effect size. In the context of this document, meta-analysis is used to compare the effectiveness of different medications in treating malaria.

The meta-analysis involved comparing the incidence of malaria among patients treated with Artesunate and Quinine. Artesunate is a medication used to treat malaria, while Quinine is another medication used to treat this disease.

The incidence of malaria was measured as the proportion of patients who developed malaria during the study. The meta-analysis was conducted using a random effects model, which takes into account the variability among the studies.

The results of the meta-analysis showed that Artesunate was more effective than Quinine in reducing the incidence of malaria. The odds ratio (OR) for Artesunate was 0.69, with a 95% confidence interval (CI) of 0.49 - 0.97. This indicates that Artesunate had a 31% lower incidence of malaria compared to Quinine.

The meta-analysis was conducted using data from 10 randomized controlled trials, which included a total of 1,825 patients. The trials were conducted in different countries and had different sample sizes, which makes the results more generalizable.

In conclusion, the meta-analysis provided strong evidence that Artesunate is more effective than Quinine in reducing the incidence of malaria. This finding is important for public health officials and policymakers, as it can help inform decisions about which medication to use in the treatment of malaria.
The following references are needed for the text below:


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**A Review: Parenteral Artesunate Will Save ~ 200,000 Children With Severe Malaria Annually**

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**Abstract**

Severe *P. falciparum* malaria kills people, particularly African children ~ 200,000 per year. Quinine and quinidine infusions were the only antimalarial drugs available to treat severe malaria until recently. The rediscovery of artemisinins in 1972 and subsequent synthesis of artemether and artesunate have provided highly effective alternatives to quinine. Results from meta-analysis demonstrated that artemether significantly reduced mortality in adult patients with severe malaria from Southeast Asia. Pharmacokinetic studies suggest that the oil-soluble artemether, which can be given intramuscularly but not intravenously, is poorly and slowly absorbed from the injection site while the water-soluble artesunate is absorbed rapidly and reliably. The SEAQUAMAT study comparing intravenous artesunate vs quinine among adults and children in 4 Asian countries and demonstrated a significant absolute reduction of mortality of 34.7% (95%CI = 18.5 – 47.6%). A subsequent study (AQUAMAT study) conducted in African children with severe malaria in 9 countries confirmed the excellent efficacy of artesunate with a significant relative reduction of death of 22.5% (95%CI = 8.1 – 36.9%). A large meta-analysis with more than 7,000 patients also confirmed that artesunate significantly reduced mortality in Africa of 22.5% and that in Asia of 38.6%. Patients treated with quinine had significantly higher incidence of hypoglycemia when compared to those who received artemesate. If these studies had been conducted 20 years earlier, perhaps 4 million patients with severe malaria would not have died particularly African children. Parenteral artesunate should replace quinine everywhere in the world as the first line treatment of severe falciparum malaria. Such a change in policy would save an estimated 200,000 live of children with severe malaria each year. With support from the Global Fund for the fight against AIDS, Tuberculosis and Malaria (GFATM), Laos changed the national policy of severe malaria treatment to artesunate as first line in 2006.

**Keywords:** severe malaria, *Plasmodium*, artesunate, quinine, review, Laos.

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