

# First use of intravenous artesunate in Liberia and effect on patient mortality relative to artemeter and quinine: a cross-sectional study

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## Abstract

**Background** Intravenous artesunate reduces mortality by 35% relative to intravenous quinine. In 2010, WHO changed guidelines favouring intravenous artesunate, yet wide-scale adoption lags. In April, 2012, the Clinton Foundation with the Liberian Health Ministry brought intravenous artesunate into Liberia's busiest paediatric centres, Redemption and JDJ. The Foundation reached out to the International Rescue Committee, a non-governmental organisation that supported the hospitals, to implement the change.

**Methods** We created a JDJ decision support instrument to guide and document proper intravenous artesunate administration. 4 months later, in July–October, 2012, we determined the proportion of children aged 1–16 years who were admitted for malaria with a positive rapid diagnostic test or malaria smear, the proportion who received intravenous artesunate, and the proportion who died. We compared these findings with the same period 1 year earlier when artesunate was not available.

**Findings** From July to October, 2011, 707 patients were admitted to JDJ for malaria with 67 deaths, giving a mortality rate of 0.0950. 1 year later, 811 patients were admitted with 48 deaths, giving a mortality rate of 0.059—a decrease risk of 0.6455 (95% CI 0.4514–0.9231,  $p=0.0155$ ). In 2011, no patients received intravenous artesunate, 650 (92%) intramuscular artemether, and 21 (3%) intravenous quinine. 1 year later, 632 (78%) of malaria patients received intravenous artesunate and 178 (22%) intramuscular artemether.

**Interpretation** We show how malaria treatment can be changed quickly and effectively towards contemporary care standards. Our findings support the probable benefit of intravenous artesunate in Liberia and the need for the Ministry of Health to ensure artesunate supply and provider friendly treatment guidelines.

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## Contributors

WW created the implementation instruments and study design, recorded the data, and analysed the results. AK oversaw the programme implementation at JDJ and collected and recorded data. BD provided Ministry support for the intravenous artesunate use at JDJ and political and policy guidance.

## Declaration of interests

We declare that we have no competing interests.

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