Safety and immunogenicity of the malaria vaccine candidate MSP3 long synthetic peptide in 12-24 months-old Burkinabe children.

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Date: 2009-10

Abstract:

BACKGROUND: A Phase Ia trial in European volunteers of the candidate vaccine merozoite surface protein 3 (MSP3), a Plasmodium falciparum blood stage membrane, showed that it induces biologically active antibodies able to achieve parasite killing in vitro, while a phase Ib trial in semi-immune adult volunteers in Burkina Faso confirmed that the vaccine was safe. The aim of this study was to assess the safety and immunogenicity of this vaccine candidate in children aged 12-24 months living in malaria endemic area of Burkina Faso. METHODS: The study was a double-blind, randomized, controlled, dose escalation phase Ib trial, designed to assess the safety, reactogenicity and immunogenicity of three doses of either 15 or 30 microg of MSP3-LSP adsorbed on aluminum hydroxide in 45 children 12 to 24 months of age randomized into three equal groups. Each group received 3 vaccine doses (on days 0, 28 and 56) of either 15 microg of MSP3-LSP, 30 microg of MSP3-LSP or of the Engerix B hepatitis B vaccine. Children were visited at home daily for the 6 days following each vaccination to solicit symptoms which might be related to vaccination. Serious adverse events occurring during the study period (1 year) were recorded. Antibody responses to MSP3-LSP were measured on days 0, 28, 56 and 84. RESULTS: All 45 enrolled children received three MSP3 vaccine doses. No serious adverse events were reported. Most of the adverse events reported were mild to moderate in severity. The only reported local symptoms with grade 3 severity were swelling and induration, with an apparently dose related response. All grade 3 adverse events resolved without any sequelae. Both MSP3 doses regimens were able to elicit high levels of anti-MSP3 specific IgG1 and IgG3 antibodies in the volunteers with very little or no increase in IgG2, IgG4 and IgM classes: i.e. vaccination induced predominantly the isotypes involved in the monocyte-dependent mechanism of P. falciparum parasite-killing. CONCLUSION: Our results support the promise of MSP3-LSP as a malaria vaccine candidate, both in terms of tolerability and of immunogenicity. Further assessment of the efficacy of this vaccine is recommended.