Functional assessment of monoclonal antibodies for their ability to block in vitro the invasion of Peruvian P. falciparum parasite isolates into erythrocytes

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Abstract:

Introduction

Studies on malaria in the Peruvian Amazon have demonstrated the association between IgG response in individuals infected with low parasitemia and asymptomatic invasion proteins: EBA-175, RH2b and MSP10 of P. falciparum. For this study, we hypothesized that antibodies against these proteins would be able to inhibit the invasion process of P. falciparum isolates from the Peruvian Amazon into erythrocytes in vitro.

Methodology

Three monoclonal antibodies (mAb) against EBA-175, three mAb against RH2b, seven mAb and a polyclonal antibody (pAb) against MSP10 were characterized by Western blot, IFI and confocal microscopy methodologies and later evaluated functionally in Inhibition Assays (IIA) in order to show if they could inhibit the merozoite invasion process in to erythrocytes in vitro.

Results

The mAb evaluated against EBA-175 and RH2b proteins were not able to detect their target protein. Only the mAb anti-MSP10 directed against the N-terminal region (anti MSP10-1) and the pAb anti-MSP10 was shown to be specific for the detection of MSP10 by all methodologies. They also showed an inhibitory capacity of up to 40% [100 μg / mL] and 19-100% [0.1-10 mg / mL], respectively.

Conclusions

This the first study to evaluate the role of anti-MSP10 antibodies in the invasion of P.falciparum isolates, from the Peruvian Amazon, into the erythrocyte in vitro.