Immunoepidemiology of *Plasmodium vivax* MSP-1 and AMA-1 in two previous high malaria endemic districts in Sri Lanka under the prevention of re-establishment phase

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Sri Lanka was certified malaria free by the WHO in 2016. The presence of the malaria vector in the island, and imported malaria cases pose major risks during the current Prevention of Re-establishment (POR) phase in Sri Lanka. As serological parameters may indicate malaria transmission dynamics, assessment of antimalarial antibody prevalence/titers in populations will be indicative of the status of current infections and hence of malaria transmission. Yet, malaria immunoepidemiology studies in countries successful in eliminating malaria are nonexistent. We aimed to determine the prevalence of antibodies to *Plasmodium vivax* vaccine candidate antigens, PvMSP1-19 and PvAMA1, in residents of two previous high malaria endemic districts, Hambantota and Kilinochchi; Nuwaraeliya served as the control/malaria-free district. Indirect ELISAs assayed antibody responses against two recombinant proteins, PvMSP1-19 and PvAMA1, on serum samples collected with informed consent from study participants. In a total of 3129 individuals (Hambanthota-1231, Kilinochchi-1398, and Nuwaraeliya-500) recruited for the study, Anti-MSP1-19 antibody prevalence was 2.0%, 5.0% and 1.0% while anti-AMA1 antibody prevalence was 5.0%, 14.0% and 2.0% in Hambanthota, Kilinochchi and Nuwaraeliya districts, respectively. Compared to the controls, antibody magnitudes to both PvMSP1-19 and PvAMA1 were significantly higher in Kilinochchi ($p<0.005$ and $p=0.022$, respectively) than in Hambantota ($p=0.001$ and $p<0.005$). Previous exposure to malaria was significantly associated with antibody responses against both PvMSP1-19 and PvAMA1 among all three districts ($p<0.05$). In comparison, based on previous records the prevalence of antimalarial antibodies to MSP1-19 and AMA1 in the Hambantota district during 1998–2003 were 59% and 54%, respectively. In conclusion, though significant seroprevalence to *P. vivax* antigens, MSP1-19 and AMA1, was evident in residents of previous high malaria endemic areas in comparison to a previous malaria non-endemic area under a POR setting, compared to malaria pre-elimination data, these have declined to low levels which may suggest the absence of current malaria transmission.

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