

A-31: Antibody levels to epitopes on sporozoite and merozoite surface antigens of malaria parasites related to malaria transmission rates in the dry zone

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Antibody levels to repetitive epitopes on the circumsporozoite proteins of *Plasmodium falciparum*, *P. vivax* and *P. vivax* variant 247 and non-repetitive epitopes on 2 merozoite surface antigens of *P. falciparum* (the 185 kDa PMMSA and the 45 kDa GYMSSA) were determined by radioimmunoassay (RIA). A sample population of 124 persons was randomly selected from Weheragala, a cashew plantation area in Mahaweli System C in Polonnaruwa district. Sera were collected in February, immediately after the end of the peak transmission season, and in May, 3 months later, during the low transmission season. Out of the original 124 persons, only 85 persons participated in the second clinical examination in May. Sera from 9 persons, living in Colombo with no history of malaria in at least the previous 2 years, were collected as controls. RIA was carried out using I¹²⁵ labelled sheep anti human Ig.

Target antigens used in the assay were: Recombinant proteins containing *P. falciparum* and *P. vivax* circumsporozoite protein repeats, Pv 247 (a synthetic peptide containing 3 repeats of the variant *P. vivax* circumsporozoite protein), and peptides derived from 2 merozoite surface antigens. Each serum was assayed on plates with test antigen and without antigen. A serum was scored positive if the observed c.p.m. exceeded the mean value for control sera by two standard deviations.

The highest proportion of individuals having detectable antibodies was observed for *P. falciparum* CS repeat (100% in children and 95% in adults in February). These rates decreased in May (69% in children and 88% in adults). The proportions of adults and children who had antibodies to the merozoites surface antigens also decreased from February to May. During the same period there was a fall in the levels of antibodies to the different epitopes used in the assay. Up to 59% of persons had antibodies to the variant *P. vivax* strain indicating for the first time, that the variant was prevalent in Sri Lanka. There was significant correlation between the antibody response to *P. vivax* and *P. falciparum* sporozoite antigens and also between the 2 epitopes of the 2 merozoite surface antigens. The results showed that antibody levels (measured by c.p.m.) decline to half their original values in about 3 months, after the end of peak transmission suggesting that there may be a seasonal fall in antibody - dependent immunity to malaria in endemic populations.