

HUMAN ANTIBODY RESPONSES TO THE *Plasmodium vivax* DUFFY BINDING PROTEIN IN SRI LANKA

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Abstract

Recombinant protein DBP, expressed in a baculoviral vector, representing the native *Plasmodium vivax* Duffy Binding Protein (DBP) was used in an indirect ELISA to assay the total anti-DBP antibody (IgM + IgG) responses in Sri Lankan patients with acute vivax malaria.

The test populations were selected from two malaria endemic areas, Anuradhapura (n=64) and Kataragama (n=93), and from an area non-endemic for malaria, Colombo (n=91). The prevalences of anti-DBP antibodies were 53%, 38% and 44% from Anuradhapura, Kataragama and Colombo, respectively. A significant difference (Chi-square test, $p < 0.05$) was found between the proportions of responders and non-responders to DBP in Kataragama. Responding proportions of individuals previously exposed (PE) and previously not exposed (PNE) differed significantly only in Colombo (Chi-square test, $p < 0.05$). Significant differences (Mann-Whitney U test, $p < 0.05$) were evident between anti-DBP antibody magnitudes; (i) in Anuradhapura and Kataragama and (ii) of PNE individuals from Colombo and the total responders (both PNE + PE) from Anuradhapura.

A significant difference (Mann-Whitney U test, $p < 0.01$) in the end point titers (EPT) between PNE and PE individuals was limited to Colombo. Associations between host factors (age, parasitaemia, number of past infections, the duration between present and penultimate infections and the days of symptoms) and total antibody responses (antibody magnitudes and EPT) were examined (Spearman Correlation coefficient, $p < 0.05$). The significant associations found were between (i) parasitaemia and then total antibody responses of residents in Anuradhapura, (ii) between the parasitaemia group $< 0.01\%$ and the total antibody response of residents in Kataragama (a negative correlation), (iii) number of past infections in Colombo and (iv) the duration between the present and penultimate infections in Colombo and in Anuradhapura with EPT and the antibody magnitudes, respectively.

In conclusion, results of the present study imply that naturally acquired anti-DBP antibodies may play a functional role in the immunity to vivax malaria in Sri Lanka.

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