Antibody Isotype Responses to Egg Antigens in Human Chronic Schistosomiasis Mansoni Before and After Treatment

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In the present communication we analyzed the levels of IgG1, IgG2, IgG3, IgG4 and IgE isotypes to soluble egg antigen of Schistosoma mansoni by ELISA in individuals from an endemic area for schistosomiasis in Northeast Brazil. The analysis was performed before and after treatment to evaluate the age-dependent pattern, and to identify differences in the reactivities to antigens. Our results suggest that schistosomiasis treatment would not interfere with this sort of immune response.

Key words: schistosomiasis - antibodies - treatment

Analysis of antibody responses to different antigens in patients’ sera shows that the slow development of immunity to reinfection after treatment of Schistosoma infection is partially attributable to the continued presence of blocking antibodies in susceptible individuals, particularly IgG4 and IgG2 (Demeure et al. 1993). The role of IgE in several immune mechanisms against the parasite has been described in vitro, suggesting that these mechanisms might be involved in protection against human schistosomiasis (Capron et al. 1999). The levels of IgE antibodies to S. hematobium, mainly against adult worms, increased progressively with the age of the patient and were related to resistance to reinfection after chemotherapy (Hagan et al. 1991). The influence of IgE in immunity to S. mansoni reinfection has also been reported by other authors (Dunne et al. 1992, Rihet et al. 1992, Demeure et al. 1993).

We have previously evaluated the influence of antibodies of the isotypes IgE and IgG4 on the resistance and susceptibility to infection by S. mansoni in human populations living in two contiguous endemic villages (Itapinassu and São Joaquim) in Northeast Brazil by using soluble egg antigen (SEA) and soluble worm antigenic preparations (SWAP) in an immunoenzymatic assay (ELISA). An association between age and levels of IgE schistosome-specific antibodies was found. The age-IgE profile followed that expected for an antibody involved in resistance to infection (Gomes et al. 1998).

Before treatment, IgE and IgG4 anti-SEA antibody levels were more elevated than IgG1, IgG2, and IgG3 (Fig. 1). These antibody levels tended to increase after treatment (Fig. 2) suggesting stimulation of the antibody response due the drug effects or antigens exposure due to parasite damage. Although the intensity of the antibody response apparently increased after treatment, the age-dependent pattern of antibody response was very similar. The peaks of IgE and IgG4 antibody response were clearly in the 10-19 year age group. In contrast, changes in the levels of the other isotypes analyzed were not so apparent. We have also analyzed antibody responses before and after treatment, using SWAP (data not shown). In general, the response was similar to that observed against SEA: IgG4
antibodies were the most elevated, and the levels of antibodies were maximal (p < 0.05) in young adults (15-19 years). Nonetheless, before treatment the first peak of IgG4 occurred at a younger age range (10-14 years), in comparison to the humoral response observed after treatment, suggesting that treatment interferes with the production of IgG antibodies.

As IgE anti-parasite antibodies have been implicated as protective, our results suggest that schistosomiasis treatment would not interfere with IgE dependent protective immunity. Nevertheless, one should notice that, in addition to IgE antibodies, potentially blocking IgG4 antibodies, were also increased after treatment, peaking at the same age-group.

REFERENCES


