

Immunity after treatment of human schistosomiasis mansoni. II. Identification of resistant individuals, and analysis of their immune responses.

Butterworth, AE; Capron, M; Cordingley JS, JS; Dalton, PR; Dunne, DW; Kariuki, HC; Kimani, G; Koech, D; Mugambi, M; Ouma, JH; et al

Date: 1985

Abstract:

Intensities of re-infection were monitored at three-monthly intervals after treatment of *Schistosoma mansoni* infections in a group of 119 Kenyan schoolchildren, whose levels of water contact were also observed. 22 children showed high reinfection intensities (greater than 100 eggs per gram of faeces) by 12 months after treatment, and were considered to be susceptible. Out of 70 children who showed low reinfection intensities during the same period (less than 30 eggs per gram), 35 showed high levels both of total water contact and of contact with sites containing infected snails. In these children, the relative lack of reinfection could not be attributed to a lack of exposure, and they were classified as resistant to reinfection. Comparison of the two groups, resistant and susceptible, revealed no difference in pretreatment intensities of infection. However, there was a marked difference in age, the mean age of the resistant group being two years greater than that of the susceptible group, within a restricted starting age range. These findings indicated that resistance was an acquired and age-dependent phenomenon, not obviously related to previous egg-induced pathology. Studies of immune responses revealed no clearcut correlate of resistance, but there were interesting differences between the two groups. Whereas anti-egg antigen responses declined after treatment to a greater extent in the resistant than in the susceptible group, antibodies mediating eosinophil-dependent killing of schistosomula rose markedly in both groups, strongly suggesting that the resistant children were being exposed to cercariae. Anti-adult worm antibodies rose sharply in both groups immediately after treatment, and thereafter declined to pretreatment levels. Although some individual children showed high levels of IgE anti-schistosomulum antibodies, there were no significant differences between the two groups. Since all children showed detectable levels of antibodies mediating eosinophil-dependent killing of schistosomula, the possibility was considered that such antibodies might be a necessary, but not a limiting, factor in immunity. Instead, the functional state of the effector cells mediating antibody-dependent killing might be limiting. Eosinophil levels, measured as an indirect estimate of eosinophil functional activity, did not differ between the two groups. There were, however, marked differences between different individuals in their capacity to produce eosinophil-stimulating monocyte mediators, and although this cannot yet be related to resistance, this aspect is worth further study