Schistosomiasis, commonly known as bilharziasis, is endemic in the tropics and subtropics in more than 76 countries where over 200 million people are infected and about 800 million at risk of infection. Currently, the leading control measure directed towards the reduction of morbidity and mortality is chemotherapy using Praziquantel. But with the rising problem of drug resistance and reinfection, the focus has shifted to the development of an effective vaccine. The radiation attenuated cercariae (RA) vaccine is the most effective vaccine to date (>70% protection in animal models) with protection levels associated with IgG antibodies. In the last few decades, there has been considerable research on the RA vaccine resulting in a thorough analysis of various parasitological and immunological parameters. However, in the field, the presence of a previous or ongoing infection in individuals may affect the efficacy of the vaccine due to shifts in immunological responses observed after treatment. This study therefore aimed at investigating the production of IgG antibodies to four antigens: schistosome egg antigen (SEA), egg-secreted protein preparation (ESP), egg-specific calcium-binding protein (SmE16), and soluble adult worm preparation (SWAP) in baboons (Papio anubis) vaccinated with the RA vaccine with a previous or ongoing infection.

The relationship between the IgG and IgG1 levels and protection and the specific egg and adult worm proteins responsible for the IgG response were also examined. To determine the antibody levels, ELISA technique was used while SDS-PAGE and western blots were used to establish the IgG inducing proteins. Results showed a sharp increase in IgG responsiveness to SEA and ESP at week 8 and 12 post infection respectively and a slow build up of SWAP-IgG antibodies. During treatment there were no significant changes in anti-IgG response to the four antigens. On the other hand IgG levels in response to SEA, ESP and SWAP were sustained by the five vaccinations though by perfusion time only SEA and ESP levels were still elevated. Despite these levels, there was no correlation between SEA-IgG and ESP-IgG levels with protection while there was a positive correlation between protection and IgG-SWAP. With SmE16, there was no significant change in IgG levels in the three groups. IgG1 production against the antigens was lower than whole IgG with adult worm antigens stimulating higher responses than soluble egg antigens. Correlation analysis showed a positive relation between the IgG1 levels produced against the soluble egg and adult worm antigens and protection but not to egg-secreted antigens. The soluble egg proteins that stimulated IgG production were identified as having molecular weights of 14, 20, 23, 25, 30 and 45 kDa while the 45, 47, 67 and 97 kDa adult worm proteins were recognized during infection, chemotherapy and vaccination. Egg-specific protein was only recognized after probing with sera from treated animals. These results suggest that IgG and IgG1 antibodies play an important role in protecting animals with an ongoing or previous infection with stimulation from the adult worm antigens. It is also evident that egg antigens will always evoke a high immunological response despite low protection levels.

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