IMMUNITY AND IMMUNOPATHOLOGICAL STUDY OF IRRADIATED SCHIZONT-STAGE OF PLASMODIUM BERGHEI IN IMMUNIZED MICE AFTER CHALLENGE WITH VIABLE SCHIZONT-STAGE PARASITES

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ABSTRACT

Mice were immunized intraperitoneally with 2×10^6 irradiated P. berghei schizont-stage infected erythrocytes at biweekly interval for five doses and boostered twice eight weeks after the last immunization for the Experiment A. For the Experiment B, irradiated P. berghei schizont-stage infected reticulocytes were given instead of erythrocytes. All mice were challenged with 2×10^5 viable schizont-infected erythrocytes eight weeks later. Then three mice were killed at 3 days interval until 27 days for the Experiment A and until 9 days for the Experiment B for immunopathological and histopathological studies, while the reminders were used for protective effect study.

Some mice in Experiment A showed the same results as control group but most of them recovered from malarial infection. Immunofluorescent study revealed deposits of malarial antigen in various organs in a large amount during parasitemia.

Thereafter parasitemia decreased and completely disappeared, malarial antigen was seen in the liver, spleen and lungs but in scanty amount. Histopathological study showed accumulation of mononuclear cells in the interstitial tissue in kidney, lungs and liver. Although parasitemia was completely disappeared, cluster of malarial pigment laden macrophages could be seen in the portal area of the liver and in the red pulps of the spleen. The remaining mice were rechallenged on day 45 and 90 after the first challenge. All mice still recovered from malarial infection.

Some mice of Experiment B died during booster however the majority of them recovered. After challenged, parasitemia was initially suppressed resulting in the delayed prepatent period as compared to that of control group. Immunofluorescent study revealed small amount of malarial antigen in liver and lungs and moderate amount in spleen even though no parasitemia could be detected. The second and the third challenges were assessed on days 45 and 90. All mice still recovered from malarial infection and the histopathological alteration of liver, kidneys and spleen was not observed.

Both non specific and specific immunity might play essential role in defense mechanism in vaccinated mice. Macrophages were prominent in liver and spleen as well as the high percentage of monocytes in peripheral blood. The levels of antimalarial antibody in both experimental groups were much higher than control group indicating the role of humoral immune response. In addition cell mediated immunity might involve in damaging the parasites directly or indirectly via activation of other effectors.

BIOGRAPHY

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