STUDIES ON PROTECTIVE EFFECT, IMMUNOPATHOLOGY, PATHOLOGY AND SEROLOGY OF VACCINATED MICE WITH IRRADIATED BLOOD STAGE OF PLASMODIUM BERGHEI: VARIATIONS IN VACCINATING DOSES AND INTERVALS BETWEEN VACCINATION AND CHALLENGE

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ABSTRACT

Following the previous study, an attempt was made to induce protective immunity of mice by vaccination with radiation attenuated blood stage of P. berghei.

The experiment was performed by injection, intraperitoneally, of 5 immunizing doses, each of $2 \times 10^6$ gamma irradiated parasitized red cells by weekly interval. For the first series, mice were challenged with $2 \times 10^6$ viable parasites at the 12th week of the experiment. These mice were then killed at every 3 days interval. While mice of the second series were further immunized by weekly interval of $2 \times 10^6$ irradiated parasitized erythrocytes, for four weeks and waited until the 19th week of the experiment. These boostered mice were subdivided into two groups and challenged. The primary group received only one challenging dose of $5 \times 10^5$ viable parasites
while the secondary group received by weekly interval of two challenging doses, each of $5 \times 10^5$ viable parasites. These challenged-vaccinated mice and their control infected mice were killed at weekly interval after infection.

The results showed that the vaccinated mice of the first series expressed no significant differences from the control group. In contrast to the 2nd series of experiment, 60-70% of vaccinated mice were still alive while 100% of the controls died at day 14 of infection. The delay in patent infection, the prolonged survival time and low grade parasitemia were observed in vaccinated mice as compared with the control infected groups. During the course of infection the percentage of T and B cells decreased but the probable "null cell" population increased.

However, the vaccinated mice of both series showed higher anti-malarial antibody titres than the control groups during the course of infection. Immunofluorescent study of tissues in both series of the vaccinated mice and the controls revealed the same intensity of staining for malarial antigen in the Kupffer cells of livers, alveolar macrophages of lungs, reticuloendothelial (RE) cells in the interstitial tissues of kidneys, brain and spleen. Histopathological study showed striking accumulation of mononuclear phagocytic cells in the lungs and the kidneys of the vaccinated mice. Both series of vaccinated mice and the controls developed severe pathological alteration in kidneys, liver, lungs and spleen at later of infection. These observations indicate that vaccination with multiple doses of antigen have induced partial immunity but is insufficient to render the protection against infection.
BIOGRAPHY

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