An extended account of these and related experiments will be published elsewhere.

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VIROLOGY

Polyoma Virus in Syrian Hamsters: a Non-communicable Infection

EPIZOOTICS caused by polyoma virus have been reported^{1,2} in mouse colonies maintained in proximity to mice infected experimentally with this virus. Establishments without facilities to house infected and uninfected mice in separate buildings run the risk of contaminating their polyoma-free stock. It was of interest to determine, therefore, whether similar problems would be encountered when the Syrian hamster was used as the experimental animal to study this disease. Our experience indicates that infected hamsters rarely transmit polyoma virus to other hamsters or mice. The evidence that polyoma infection is a much less contagious disease of hamsters than of mice is shown by the following experiments.

(1) Hamsters less than 24 hr. old were divided into three groups and injected subcutaneously in the interscapular region with either $10^{5.5}$ mouse embryo tissue culture doses (TCID₅₀) of polyoma virus, $10^{2.5}$ TCID₅₀, or sterile diluent fluid. The hamsters were appropriately marked and distributed among 13 mothers so that each litter contained 2-4 animals from each group. The hamsters were weaned and placed in separate cages when they reached 21 days of age. Approximately half the hamsters were bled between 41 and 59 days of age. Autopsies were performed on all hamsters dying during the experiment. At 98 days of age the surviving animals were bled, killed and autopsied. The sera were tested by haemagglutination-inhibition and complement fixation for the presence of antibody to polyoma virus as described elsewhere³. As shown in Table 1, there is no evidence that any of the litter-mates injected with sterile diluent fluid contracted infection with polyoma virus.

(2) During assays of tumour-inducing capacity of polyoma virus in hamsters, approximately 200

suckling animals and more than 400 weaned animals were housed at the same time in nursing or individual cages in a single room with a floor area of 900 sq. ft. The hamster cages were arranged in series on long tables according to the age of the animals. To test whether the virus could spread from hamsters to mice, 7 cages each containing 5 young (8-10 gm.) mice were distributed in the room, some adjacent to cages occupied by suckling hamsters recently injected with polyoma virus, some among 21-50-day-old infected hamsters, and others among cages containing infected animals older than 90 days of age. The mice were bled twice, at 40 and 96 days, after being placed in the environment with infected hamsters. During this time all cages were cleaned and changed as needed, and all other usual activities permitted in the room. All the sera of the mice were negative when tested by haemagglutination-inhibition and complement fixation. Careful gross inspection of the mice killed at 96 days after exposure to infected hamsters failed to reveal the presence of tumours.

(3) To achieve randomization in experiments with polyoma virus in new-born hamsters, we have distributed our inoculated hamsters so that each litter contained animals injected only with control diluent fluid as well as animals injected with various test dilutions of virus. To date, we have studied nearly 2,500 animals of which 320 were injected at birth with non-infectious materials. From autopsies and serological tests on individual sera it became apparent that only two hamsters injected with non-infectious material at birth showed evidence of infection at the time the experiments were terminated. Although we suspect that they contracted the infection from their litter-mates, we cannot exclude the possibility of error made at the time the inoculum was administered.

Several factors probably account for the non-contagious nature of polyoma infection in hamsters as compared with mice. Mice infected with polyoma virus excrete virus in urine, and cross-infection probably takes place through inhalation of aerosols^{1,2}. Hamster urine is considerably less copious, and because of their habits they are less prone to create aerosols. Moreover, virus might be lacking in their urine since polyoma virus multiplies poorly in hamsters albeit tumours are readily induced. This is evident from the finding that only a fraction of tumours induced by cell-free filtrates contain demonstrable virus⁴. Occasionally, hamsters with tumours lack demonstrable antibody⁵.

The results indicate that, with minimal care, laboratories doing research with polyoma virus in Syrian hamsters should not have much difficulty in keeping their small animal stock from becoming infected.

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Inoculum	No. injected	No. cannibalized before 21 days of age	No. with tumours	No. dead of unknown causes*	No. of animals with antibody: total tested
$10^{4.5}$ TCID ₅₀	45	2	24	6	19/21
$10^{2.5}$ TCID ₅₀	37	1	10	6	16/21
Sterile diluent fluid	35	1	0	4	0/20

* 14 of the 16 animals dead of unknown causes were dwarfs.