

STUDY REPORTS

6. Title: Mouse Pneumonia in Breeding colonies.

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OBJECTIVE

The objective of this study is to determine the extent and impact of pneumonia in the mouse colony maintained at this Laboratory and to determine the etiological agent responsible for the disease. The mouse colony disease screening program instituted in August 1968 has revealed the presence of a pulmonary condition with the general gross appearance of a viral pneumonia. The lungs are a pale greyish color and are heavily consolidated. The condition seems to be analogous to the situation discovered in November 1966 when a search was made for potential pathogens in the mouse colony.

DESCRIPTION

Standard bacteriological, virological, and pathological techniques are used to examine tissues taken from mice found to have pneumonia during routine and special necropsy procedures in the production colony disease screening program.

PROGRESS

Micropathological examination of affected tissue has revealed a severe interstitial pneumonitis. The alveolar walls and alveoli contain collections of neutrophils, fibrin, blood, and macrophages. The bronchioles are surrounded by thick walls of plasma cells and foamy macrophages. Some cases exhibited a severe interstitial pneumonia without a peribronchial infiltration of plasma cells. Pneumocystis carinii like organisms were identified in some specimens.

Bacteriological culture methods have produced a wide range of organisms. Nutrient broth and blood agar plates were inoculated with pneumonic lung tissue and the following organisms have been recovered sporadically. A. aerogenes, Alpha streptococci, P. aerogenoides, Diphtheroid sp., Micrococcus sp., E. freundii, E. coli, Proteus, and Pseudomonas. None of these are thought to be the causative agent of this condition.

Primary embryonic mouse cells and baby hamster kidney cells were prepared by standard methods in tube cultures. Several specimens from pneumonic lung were ground with a tissue homogenizer, suspended in phosphate buffered saline or Hank's balanced salts, filtered with a swinny type filter, and adsorbed to the confluent monolayer cultures for 2 hours. All efforts with filtered specimens have failed to produce a tissue culture cytopathic agent when carried through 2 or 3 passages.

Nine to ten day old embryonated hen eggs were inoculated with pneumonic mouse lung tissue. Allantoic cavity, yolk sac, and intravenous routes were used. Bacterial contaminants such as Proteus and Pseudomonas destroyed several embryos but filtered material failed to kill embryos even after three passages.

Animal inoculation experiments conducted in weanling and new born mice have given sporadic results. One series of experiments in which suspected material was inoculated into 2 day old mice by the intranasal and intraperitoneal routes gave encouraging results. The infected mice showed scurffiness of the hair coat and stunted growth after 21 days. Second passage material caused death in 14 days and mice dying exhibited the typical consolidated pneumonia. Subsequent efforts gave sporadic results and were often confusing because control litters were often found to have pneumonia also. It could not be determined if control mice were contacting the disease from their dams or from a contaminated environment. Recent efforts have been directed toward trying to produce the disease in clean imported stock.

SUMMARY

All efforts to isolate a pathogenic micro-organism from pneumonic mouse lung tissues have failed. Pathological observations and mouse inoculation studies suggest an endemic disease of viral origin.