

## Laboratory Animal Disease In Thailand : Its Occurrence and Importance to Comparative Medicine

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**OBJECTIVE :** The objective of this study is to detect and investigate spontaneous metabolic and infectious diseases of laboratory animals for the purpose of recognizing and developing animal models for research studies as well as to define and improve the health of laboratory animals maintained in Thailand.

**DESCRIPTION :** In order to accomplish the objective, a program of continuous surveillance of the health status of the animal colony has been developed. Four areas are emphasized in this program: the disease screening program conducted in the laboratory animal breeding colony, the recurring clinical and laboratory examination of animals housed in the laboratory including those procedures performed during the quarantine of newly purchased animals, complete post mortem examination of each animal that dies in the colony, and the development of standards for operation and quality control that are indicated by the resulting findings. When indicated by the findings, experimental studies are initiated to explore the problems that occur in detail.

**PROGRESS :** In the breeder disease screening program and from rodents that were autopsied because of spontaneous death, 155 mice, 60 rats, 165 hamsters, and 110 guinea pigs were examined for spontaneous lesions and bacterial flora. Table 1. No bacteria considered to be common pathogens were isolated from either the lungs or intestines. Pathological lesions in the mouse consisted chiefly of chronic pneumonia in about 5% of the animals examined with a smaller number showing multifocal hepatitis probably due to nematode parasites. Table 2. Two neoplasms, one a teratoma, occurred in the mouse colony. The only pathological lesions detected in the inbred Fischer strain rat colony were two tapeworm cysts, probably *Cysticercus fasciolaris*. Pulmonary congestion appeared in about 5% of the hamsters examined, and in an equal number liver pathology, consisting of congestion, fatty infiltration, periportal hepatitis, tapeworm cysts, and other nonspecific hepatitis was observed. Table 3. In contrast to the other rodents, there was also a significant amount of kidney pathology consisting of congestion, pyelonephritis, and cortical scarring present in the hamsters. Like the other rodents, pneumonia was the most consistently occurring lesion observed in the guinea pig. Table 4. Two cases of interstitial pneumonia, one of which was caused by *Toxoplasma*, one case of chronic bronchopneumonia, and one case of lipid pneumonia were found. Two guinea pigs had liver lesions consisting of multifocal necrosis and fatty degeneration. Acute cystic necrotizing colitis and coccidiosis were found in the intestine of one animal. Pathological lesions which were observed in primates that died spontaneously in the colony are listed in Table 4. Three macaque monkeys died from non-experimental causes during the year, the most frequent cause of death being pneumonia, with enteritis accounting for the rest of the deaths. Parasitic infections, consisting of oesophagostomiasis, whipworms, and hookworms occurred randomly in the macaques in that order of frequency. A significant number of the macaques were also naturally infected with malaria, nearly all of which was identified as *Plasmodium inui*. Microfilaria were discovered in the blood of three animals, and adult filarids were found in the mesentery of one; an identification of this parasite was not made. Nine non-experimentally induced deaths occurred among the gibbons. Although pneumonia was apparently the leading cause of death, intercurrent pathological processes in other organs as well often complicated a clear diagnosis. Strongyloidosis and lymphoproliferative diseases, which are described elsewhere in this report, were involved in seven cases of death or terminal illness, and are considered significant pathological observations.

Table 1. Bacteria Recovered from the Lungs and Leces of Laboratory Rodents.

| Species    | Number animals examined | Bacterial Findings |    |   |   |              |   |                       |   |                  |   |                  |       |   |   |    |   |    |   |    |             |   |             |    |                        |   |                      |   |    |    |   |   |   |   |   |
|------------|-------------------------|--------------------|----|---|---|--------------|---|-----------------------|---|------------------|---|------------------|-------|---|---|----|---|----|---|----|-------------|---|-------------|----|------------------------|---|----------------------|---|----|----|---|---|---|---|---|
|            |                         | Lung               |    |   |   |              |   |                       |   |                  |   |                  | Stool |   |   |    |   |    |   |    |             |   |             |    |                        |   |                      |   |    |    |   |   |   |   |   |
| Mouse      | 155                     | Pseudomonas spp.   | 10 | 3 | - | Candida spp. | - | Enterobacter freundli | - | Escherichia coli | 1 | Micrococcus spp. | 1     | 1 | 1 | 1  | 1 | 3  | 1 | 9  | Staph. spp. | - | Citrobacter | 7  | Enterobacter aerogenes | - | Enterobacter cloacae | - | 40 | 47 | 1 | 8 | 1 | 2 | 2 |
| Rat        | 60                      | Pseudomonas spp.   | 21 | 4 | 6 | -            | 1 | 1                     | 1 | 1                | 1 | 1                | 1     | 2 | 3 | 14 | - | 14 | 5 | 2  | 37          | 4 | 6           | 8  | 1                      | 2 | 8                    | 5 | 8  | 15 | 2 |   |   |   |   |
| Hamster    | 165                     | Pseudomonas spp.   | 6  | 6 | - | 1            | 1 | 1                     | 1 | 2                | - | -                | -     | 1 | 1 | 2  | 2 | 2  | 2 | 10 | 1           | - | 7           | 15 | 2                      | - | -                    | - | -  | -  | - | - |   |   |   |
| Guinea pig | 110                     | Pseudomonas spp.   | 1  | - | - | -            | - | -                     | - | -                | - | -                | -     | - | - | -  | - | 1  | 2 | 4  | 5           | 1 | 5           | -  | 2                      | 4 | -                    | - | -  | -  | - | - |   |   |   |

Table 2: Pathological findings in randomly sampled mice from the breeding colony.

Case # 1: Abdominal tumor and lymph node abscess.

Case # 2: Chronic focal bronchopneumonia with focal fetalization; also marked congestion and edema

Case # 3: Acute marked bronchopneumonia, moderate chronic murine pneumonia, and moderate congestion and edema

Case # 4: Chronic focal hepatitis, probably parasitic in origin

Case # 5: Acute multifocal hepatic necrosis

Case # 6: Severe chronic pneumonia

Case # 7: Active chronic pneumonia

Case # 8: Acute multifocal hepatic necrosis and a moderate patchy chronic pneumonia

Case # 9: Chronic murine pneumonia and acute bronchopneumonia, probably caused by bacteria.

Case # 10: Neoplasm involving the rear leg; identified as a teratoma

Table 3: Pathological findings in randomly sampled hamsters from the breeding colony.

Case # 1: Fatty infiltration of the liver with moderate hepatic congestion, moderate pulmonary congestion with severe edema, and moderate congestion of the kidney.

Case # 2: Subacute periportal hepatitis and moderate congestion of the lungs.

Case # 3: Fatty infiltration of the liver with congestion and edema of the lungs and kidney

Case # 4: Moderate chronic pyelonephritis. and marked pulmonary congestion with minimal edema.

Case # 5: Congestion of the lungs and liver

Case # 6: Hepatic parasitic cyst probably caused by Cystercercus fasciolaris and minimal chronic multifocal hepatitis

Case # 7: Acute mediastinitis of undetermined etiology

Case # 8: Pulmonary congestion and patchy edema with focal mineralization.

Case # 9: Nonspecific focal hepatitis, marked pulmonary congestion and edema, and focal scarring of the renal cortex.

Case # 10: Multiple serous cysts in the liver, probably congenital in origin.

Table 4: Pathological findings in randomly sampled guinea pigs from the breeding colony

Case # 1: Acute interstitial pneumonia

Case # 2: Focal interstitial pneumonia

Case # 3: Marked chronic bronchopneumonia

Case # 4: Severe pulmonary congestion

Case # 5: Lipid pneumonia

Case # 6: Acute cystic necrotizing colitis; coccidiosis

Case # 7: Acute severe multifocal hepatic necrosis of undetermined etiology and squamous metaplasia of the salivary duct resembling lesions produced by vitamin A deficiency.

Case # 8: Minimal bronchopneumonia and marked atelectasis

Case # 9: Focal acute bronchiolitis

Case # 10: Severe pulmonary congestion

Case # 11: Severe pulmonary congestion

Case # 12: Minimal fatty changes in the liver

Case # 13: Minimal chronic patchy pneumonia

Table 5: Pathological lesions occurring in primates which died spontaneously

|                              |                                                                                                                                                                                                                                                                     |
|------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Cynomolgus monkey, VM 37 :   | Moderate focal pneumonia, autolyzed liver and kidney, pigment in the spleen and brain, moderate kidney congestion, and microfilaria in the lung, brain, and heart.                                                                                                  |
| Rhesus monkey, SP 6 :        | Marked gastritis of undetermined etiology, focal scarring of the kidney, and marked congestion of the spleen, kidney, and brain.                                                                                                                                    |
| Cynomolgus, Y 012 :          | Acute bacterial bronchopneumonia, marked oesophagostomiasis of the intestine and mesentery, and a moderate fatty liver.                                                                                                                                             |
| White handed gibbon, B 9 :   | Moderate acute bronchopneumonia, marked pulmonary hemorrhage, minimal to moderate <u>Strongyloides</u> infection of the small intestine.                                                                                                                            |
| White handed gibbon, B 80 :  | Severe pulmonary hemorrhage, mild interstitial nephritis, moderate congestion of the liver, kidney, and intestine, and autolytic changes in the liver and intestine.                                                                                                |
| White handed gibbon, B 86 :  | Marked enteritis of the large intestine possibly the result of a <u>Strongyloides</u> infection, minimal multifocal scarring of the kidney, marked multifocal hemorrhage of the lung, and minimal focal interstitial pneumonia.                                     |
| White handed gibbon, PC 4 :  | Post anesthetic shock. No lesions.                                                                                                                                                                                                                                  |
| White handed gibbon, S-53 :  | Marked enteritis due to infection with <u>Strongyloides</u> nematodes with regional lymph nodes containing migrating larvae, marked pulmonary hemorrhage, focal scarring of the kidney, multifocal pancreatic hemorrhage, and focal heteroplastic bone in the lung. |
| White handed gibbon, S-74 :  | Terminal periosteal proliferative disease, described separately.                                                                                                                                                                                                    |
| White handed gibbon, S 90 :  | Terminal periosteal proliferative disease, described separately.                                                                                                                                                                                                    |
| White handed gibbon, S 93 :  | Terminal periosteal proliferative disease, described separately.                                                                                                                                                                                                    |
| White handed gibbon, VM 63 : | Mild interstitial pneumonitis with focal pulmonary hemorrhage, moderate congestion of the kidney, liver, intestine, and brain, chronic enteritis of the large intestine, and acute parasitic enteritis of the small intestine.                                      |