Diagnostic Exercise

From The Davis-Thompson Foundation*

Case #: 102 Month: August Year: 2018

Answer Sheet

Title: Eosinophilic granulomatous pneumonia of Brown Norway Rats.

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Description: Multifocally throughout the lung, the interstitium is thickened by dense granulomatous infiltrate that also expands the connective tissue surrounding bronchioles, blood vessels and rarely bronchi. The infiltrate extends to the alveolar lumen and is admixed with multinucleate giant cells and mononuclear cells. In addition, multifocally, there are perivascular and peribronchiolar eosinophilic cuffs. Focally, there is hemorrhage in the alveolar lumen.

Diagnosis: Lung: Pneumonia, interstitial, granulomatous, mutltifocal, with multinucleate giant cells and perivascular/peribronchiolar eosinophilic infiltrate, aka eosinophilic granulomatous pneumonia of Brown Norway Rats

Rat Strain: Brown Norway (BN) Rats

Typical Gross findings:

- Multifocal pale to tan to gray to red foci, 1—3 mm in diameter

Typical Microscopic Findings:

- Granulomatous pneumonia
- Multinucleate giant cells
- Perivascular/peribronchiolar edema
- Perivascular/peribronchiolar eosinophilic infiltrate

Etiology: No etiologic agent identified, possibly environmental conditions leading to immunologic/allergic responses.

Discussion: Eosinophilic granulomatous pneumonia in BN Rats affects young adults in particular (> 7 weeks, 8-10 weeks of age), and possibly more females than males, Exact incidence is unknown, but some report 25% of incidence in 8-10 weeks old BN rats. The condition does not appear to be contagious, will not cause clinical signs or affect lifespan, and its incidence will regress as the animals age. Serology, microbiologic tests and special stains (Warthin-Starry, acid-fast, Gram) do not demonstrate an infectious agent, hence the hypothesis that it could be caused by immunologic/allergic responses.

Brown Norway rats have been used as models of allergic respiratory disease such as asthma, because of their high capacity for IgE production and their airway hyperresponsiveness following exposure to allergens (such as ovalbumin) or some chemicals. However, this common background lesion can represent a confounding factor for the interpretation of studies involving Brown Norway rats.

References and Recommended Literature:

Noritake S. *et al*. (2007). *Pulmonary inflammation in Brown Norway Rats: Possible Association of Environmental Particles in the Animal Room Environment.* Exp Anim. 56(5): 319-327.

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Percy D. and Barthold S. (2007). Rat. In *Pathology of Laboratory Rodents and Rabbits* 3rd edition (pp 125-177), Ames, IA: Blackwell.

http://www.askjpc.org/wsco/wsc/wsc98/98wsc19.htm

*The Diagnostic Exercises are an initiative of the **Latin Comparative Pathology Group (LCPG)**, the Latin American subdivision of The Davis-Thompson Foundation. These exercises are contributed by members and non-members from any country of residence. Consider submitting an exercise! A final document containing this material with answers and a brief discussion will be posted on the CL Davis website (http://www.cldavis.org/diagnostic_exercises.html).

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