BRIEF NOTE

Pathological Study on Lungworm Disease in the Wild Japanese Serow, Capricornis Crispus

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(Received for publication September 22, 1980)

Japanese serows are protected by law, so systemic epidemiological investigations have never been performed. During the period from December, 1979 to March, 1980, a large number of these animals caught in Gifu prefecture, were brought to our laboratory. Upon necropsy, pulmonary lesions due to infection with Protostrongylus shiozawai were the most common findings. The purpose of this report is to reveal the widespread invasion of this parasite in the Japanese serow, one of the “special natural monument”, and to describe the pathological changes in their lungs.

Materials subjected to the present study consisted of 119 cases including fawns, yearlings and adults.

Macroscopically, pulmonary lesions were mostly distributed bilaterally in the caudal part of the posterior lobes. They were somewhat hard in consistency, yellowish-white in color, as large as a soybean to a thumb in size, and had rather sharp margins. Sometimes fibrous villi were found on the pleural surface. In cut sections, minute white patches were observed throughout the consolidated areas.

Microscopically, the lesions were characterized as follows: 1) Living and dead parasites including adults, larvae and eggs were noted in the cavity of bronchioles, alveolar ducts and alveoli (Fig. 1); 2) cellular reactions consisted of eosinophils, neutrophils, lymphocytes, plasma cells, macrophages and multinucleated giant cells (Fig. 2); 3) parasitic minute granulomas composed of dead parasites and giant cells centrally, and lymphocytes, macrophages and connective tissues peripherally (Fig. 3). Moreover, a remarkable finding was the appearance of numerous globule leukocytes in the bronchiolar epithelium (Fig. 4). The cells were characterized by conspicuous eosinophilic granules or droplets present in the cytoplasm. They were most easily seen in

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section with PTAH, where the granules appeared dark blue to black. In other methods, the granules were positive with PAS, variable with alcian blue, and not metachromatically stained with toluidine blue at pH 2.3 and 4.7. Furthermore, hyperplasia of peribronchial lymph follicles and hypertrophy of bronchial circular muscles were prominent in severely affected cases.

Ohbayashi and Ueno (1974) examined two Japanese serows from Nagano prefecture and described Protostrophylus shiozawai as a new species [4]. Thereafter, the parasites were also found in animals from Iwate [1], Fukushima and Yamagata prefectures [2]. Parasitologically, lung worms in the present study were identical to those described in the previous reports [4], and the resulting pulmonary lesions were found in over 70% of the cases examined. Therefore, these findings suggest that lungworm diseases were not only enzootic but epidemic among wild Japanese serows.

Histopathologically, pulmonary lesions in the present study were largely similar to those described in the previous reports [2, 5], but different in the following points. In our cases, eosinophil infiltration was observed to different degrees in almost all of the affected cases. Furthermore, occurrence of globule leucocytes attained 80% of infected cases. The cells were principally distributed in the bronchiolar epithelium with affected lobuli and hardly ever found in those without infection. These facts support the correlation of the occurrence of the globule leucocytes and parasite invasions in the lung, as reported in the digestive tracts of ruminants [3, 6].

References
Explanation of Figures

Fig. 1. Numerous larvae and eggs (E) in the alveoli. H.E. staining, ×250.

Fig. 2. Cellular infiltration and multinucleated giant cells enclosing dead larvae. H.E. staining, ×250.

Fig. 3. Parasitic minute granuloma. H.E. staining, ×200.

Fig. 4. Prominent appearance of globule leucocytes in the bronchiolar epithelium. H.E. staining, ×500.