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TWO CASES OF ADIASPIROMYCOSIS IN SMALL MAMMALS

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SUMMARY

One case each of *Apodemus argenteus* (Rodentia) from Japan and *Soriculus nigrescens* (Insectivora) from Nepal manifested pulmonary adiaspiromycosis caused by *Emmonsia crescens* EMMONS et JELLISON, 1960. Adiaspores of these cases were 200 to 540 μ in diameter, and host tissue reactions were minimal. Nepal is a new locality for this fungus.

During the investigation of endoparasites of small mammals, we found 2 cases of adiaspiromycosis caused by *Emmonsia crescens* EMMONS et JELLISON, 1960. DVOŘÁK (1969) made a list of hosts of adiaspiromycosis, in which more than 50 species of mammals belonging to Rodentia, Lagomorpha, Insectivora and Carnivora were contained as positive hosts reported. This fungus is found from nearly all parts of the world.^{3,5,9} In Asia, the fungus was reported rarely in rodents from Korea and Japan⁶, although Hindu Kush has been added as a new locality by BLAŽEK and DANIEL (1970). The second case in the present paper is new to Nepal.

MATERIALS AND METHODS

In Nepal, about 240 specimens of various small mammals were collected by Dr. H. ABE of the Institute of Zoology, Faculty of Agriculture, Hokkaido University, during a period from April to July, 1968. One case (case 1) out of 44 *Soriculus nigrescens* (GRAY) was positive for adiaspores. This case was collected at Bokajhunda, northwest of Katmandu, on 30 May. The specimen was preserved in formalin solution. On the other hand, Dr. ABE and co-workers collected 615 specimens consisting of various voles and shrews at Nopporo, a suburb of Sapporo. Their material covered all months from June, 1967, to May, 1968. All the specimens, after mammalogical examination, have been preserved in a freezer. Up to this time, parasites have been examined on 50 specimens of *Apodemus argenteus* (TEMMINCK), and one of them (case 2) was positive.

Serial sections were made by paraffin-embedding method from the formalin-fixed lungs of the two animals above-mentioned. The sections were stained by hematoxylin-eosin and PAS. Some adiaspores were separated using a needle, and mounted by lacto-phenol solution.

RESULTS

Case 1 *Soriculus nigrescens* In all lobes of the lungs, numerous whitish foci of spherical shape, about 0.5 mm in diameter, were scattered. The foci situated subpleurally, showing slight protrusion on the surface, and deep in the parenchyma. The focus contained centrally a spherical adiaspore, of which the wall was recognized as a ringform translucent structure. The bronchi and bronchioli contained a large amount of minute particles of soil elements. Histologically, the focus was nodular and granulomatous containing one or, very rarely, two adiaspores. The focus was about 300 to 500 μ in diameter, and its shape was spherical excepting an ellipsoid one with 2 adiaspores. The granulomatous tissue was composed of epithelioid cells, and peripheral accumulation of plasma cells was remarkable. Peripheral fibrosis was slight in degree. Light accumulation of lymphoid cells was found in some foci. The adiaspore was about 200 to 300 μ in diameter showing a spherical shape. The wall was 34 to 46 μ in thickness. In sections stained by hematoxylin-eosin, it was established by two layers; an outer layer of red stain, 4 to 6 μ in thickness, and a homogeneous layer stained faintly, 28 to 40 μ in thickness. In the latter layer, however, a non-homogeneous zone was differentiable in contact with the outer layer. The content of the cavity was fine-granular and showed basophilic stain. In some foci, degenerated polymorphonuclear leucocytes accumulated around the adiaspore. In these foci, the fungus itself was also regressive; in one focus, the outer layer of the wall desquamated and embedded in surrounding tissue showing undulation and fragmentation. Giant cells were rarely found. Peribronchial and perivascular fibrosis were observed frequently, and were accompanied by peripheral histiocytic accumulation.

Case 2 *Apodemus argenteus* Nine nodular foci less than 1 mm in diameter were found in the lungs. Characteristics of the foci were similar to those of the preceding case, but the adiaspores were very large, up to 544 μ in diameter, and the host tissue reactions were slight in degree. Perifocal alveoli were pressed by the enlarged focus. In surrounding tissue, fibrosis was minimal and epithelioid cells were indistinguishable. Light peripheral accumulation of histiocytes was observed. The wall of adiaspore, especially in the homogeneous layer, was strongly positive for PAS reaction. Occasionally on the inner surface of the wall, many mound-like or spherical protrusions about 30 μ in diameter were found.

DISCUSSION

In CUEVA and LITTLE's human case (1971), lipoid pneumonia and purulent bronchiolitis were described, although they found no relationship with the mycotic infection. In our case 1, vascular and respiratory systems other than foci also showed peripheral fibrosis and histiocytic accumulation. The relationship between these changes and mycosis was unknown, but the changes were possibly caused by chronic stimulation of foreign bodies inhaled, and this fact suggests also a possibility of the mycotic infection.

ŠLAIS et al. (1970)⁷⁾ pointed out a possibility of diagnosing it as ascarid infection. As for our experience, the focus showed some similarities to encysted

larval nematode, i. e., larval *Porrocaecum*. ŠLAIS et al. (1970)⁸⁾ reported existence of internal bodies in the adiaspore. As mentioned above, the adiaspore of case 2 in the present paper showed similar protrusions on the inner surface of the wall, but these are insufficient to determine as the internal body.

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EXPLANATION OF PLATE

- Fig. 1 Case No. 1, *Soriculus nigrescens*, lung showing multiple foci
H.-E. stain
- Fig. 2 Case No. 1, a focus with two adiaspores H.-E. stain
- Fig. 3 Case No. 1, an adiaspore Mounted by lacto-phenol
- Fig. 4 Case No. 2, *Apodemus argenteus*, an adiaspore showing internal
protrusions of the wall PAS reaction

