THE MEDICAL IMPORTANCE OF MICROSPORIDA

Microsporidia are common parasites of laboratory rodents and rabbits, affecting chiefly the brain and kidney. One species, Encephalitozoon cuniculi (Levaditi, C. et al., Compt. rend. 177: 985—988, 1923) was first seen in rabbits. Electron microscopic studies on material derived from rabbits (Shadduck J. A., Science 166: 516—517, 1969) rats (Lainson R. et al., Brit. Med. J. 2: 470—472, 1964, Petri M., Acta path. microbiol. Scandinav. (Suppl.) 204: 51—91, 1969) and mice (Akae S., Japan. J. Parasitol. 18: 8—20, 1969) have shown that spores possess a single nucleus and a polar filament wound into five coils. From these studies and cross infection tests it is reasonable to conclude that parasites of the genus Encephalitozoon from rodents and rabbits belong to a single species. There is little or no mortality or clinical signs in these hosts but infections in rabbits have been associated with paralytic diseases and, in mice, abdominal distention, due to accumulation of ascitic fluid, is common during the early weeks of infection after transmission by intraperitoneal inoculation. A good general account of the species is given by Shadduck J. A. and Paker S. P. (Am. J. Pathol. 64: 657—671, 1971).

Microsporidia have also been reported from carnivores and primates, in which host the effects of parasitism were more marked. Puppies (Basson P. A. et al., J. S. Afr. Vet. Med. Assoc. 37: 3—9, 1966) and kittens (van Rensburg I. W. J. and du Plessis J. L., J. South. Afr. Vet. Med. Ass. 42: 327—331, 1971) suffered blindness and died or had to be killed. There was high mortality in suricates, arctic foxes and clouded leopards in an outbreak of infection at the Prague Zoo (Vávra J. et al., J. Parasitol. 57: 923—924, 1971).

Some reports of microsporidian infection in man cannot with certainty be attributed to this group of organisms: the parasite named Encephalitozoon chagasi by Torres C. M. (Compt. Rend. soc. biol. 97: 1787—1790, 1927) may have been Toxoplasma as was Encephalitozoon hominis (Wolf A. and Cowen D., Bulletin of the Neurological Institute of New York 6: 306—371, 1937, Wolf A. et al., Am. J. Pathol. 15: 657—694, 1939); the parasite in Coulon's patient (Coulon G., Ann. parasitol. humaine et comparée 7: 419—422, 1929) which was named Encephalitozoon brunetti and that more recently seen by Marcus (Marcus P. B. et al., Arch. Pathol. 95: 341—343, 1973) bear some resemblance to each other. E. brunetti exhibits features more characteristic of yeasts than Microsporidia (Barker R., J. Parasitol. 60: 542—544, 1974). There has been no confirmation of the occurrence of microsporidia in the neurens of patients suffering with multiple sclerosis as suggested by Víting (Víting A. I., J. Neuropath. Psychiat. 1641—1645 (in Russian), 1965) or of the presence of antibiotics against E. cuniculi (Čálovský et al., J. Protoplasz, 19, Suppl. 76, 1972).

Three cases in man are well substantiated: one was isolated from urine and cerebro-spinal fluid of a Japanese boy (Matsubayashi H. et al., Arch. Pathol. 56: 181—187, 1959); another was widely disseminated in an immunologically defective infant in the United States (Margileth A. M. et al., Arch. Pathol. 95: 145—150, 1973); the last was seen in the cornea of a Ceylonese boy suffering from defective vision (Ashton N. and Wirasingha P. A., Brit. J. Ophthalmol. 57: 669—674, 1973). As well as these cases in man, two monkeys, Satumiri sciuereus (Brown R. J. et al., J. Med. Primatol. 2: 114—123, 1973) and Callithrix boucho (Seiboldt H. R. and Fussell E. N., Lab. Anim. Sci. 23: 115—118, 1973) have died of infections in laboratories in the United States. The sources of infection for the carnivores and primates have not yet been established.

In most cases specific identity of the parasites in the carnivores and primates was not determined and authors recorded only that the parasites resembled E. cuniculi. As carnivores eat rodents we can cautiously anticipate that their microsporidia will also be E. cuniculi. In contrast, the microsporidia in primates may be opportunistic parasites from diverse sources which establish themselves only under conditions of stress, tissue damage or immunological deficiency. Electron micrographs of the parasites in the intestinal epithelium of the Callithrix monkey (Seiboldt H. R. and Fussell E. N., Lab. Anim. Sci. 23: 115—118, 1973) and in the tissue of the immunologically defective infant (Margileth A. M. et al., Arch. Pathol. 95: 145—150, 1973) showed seven and eleven coils of the polar filament respectively. By comparison with E. cuniculi which has five coils, these two should be placed in separate species.* Infections in man may prove to be more widespread than has hitherto been shown.

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