Acquired immunodeficiency syndrome (AIDS) as defined by the Centers for Disease Control (CDC) is a disease complex, at least moderately predictive of a defect in cell-mediated immunity, occurring in a person with no known cause for diminished resistance to that disease. It has now been identified in over 20 countries. Clinical presentations may include severe infections due to viruses, bacteria, fungi or protozoa, or neoplastic complications such as Kaposi's sarcoma, lymphoma, or carcinomas. Initial findings may include fever, weight loss, persistent unexplained lymphadenopathy, and diarrhea. Although no single reliable test has yet been found for the diagnosis of AIDS, the immunological defect is characterized by a depression of the ratio of helper T lymphocytes to suppressor T lymphocytes (H/S ratio).

In 1979, the first five cases of AIDS were recognized. As of July, 1984, over 5000 AIDS patients were identified in the United States. The high-risk individuals who have developed AIDS fall into the following categories: 1) homosexual or bisexual men; 2) intravenous drug abusers; 3) Haitians; 4) recipients of blood products, including hemophiliacs and others; 5) women who are sexual partners of men with AIDS; and 6) infants born to mothers in a high-risk group. We wish to report the case of a Haitian male with AIDS who presented with Toxoplasma cerebritis and in whom the specific diagnosis was rapidly established by electron microscopy.

Case Report

This 25-year-old Haitian man was admitted with progressive altered mental status of 2-week duration. Further history included 6 months of treatment for pulmonary tuberculosis and a 2-month history of diarrhea.

Examination. The patient was a lethargic, confused, febrile, well nourished man with right-sided weakness and a papular skin rash on the extremities. Cardiac and funduscopic examinations were unremarkable. Pertinent laboratory data included a peripheral blood eosinophilia of 25%, a reversal of the normal ratio of the helper and suppressor subsets of peripheral blood lymphocytes, positive tests for venereal disease, a reactive rapid plasma reagin test, and a polyclonal increase of the major serum immunoglobulins. A cerebral computed tomography (CT) scan revealed four distinct ring-enhancing lesions in the left hemisphere (two in the deep basal ganglia, another in the deep occipital lobe, and the fourth involving the cortex of the left parietal lobe). Marked displacement of the midline structures and dilatation of the right lateral ventricle were also noted, indicating mass effect with brain-stem compression.

Operation. Craniotomy and brain biopsy were performed. The tissue was submitted for immediate frozen section and electron microscopy examination. A rapid processing technique was used (slightly modified from
EM Diagnosis of cerebral toxoplasmosis

that of Miller\(^4\), so that the electron micrographs were available within 24 hours after surgery. Treatment with pyrimethamine and sulfadiazine produced marked neurological improvement within a week, and repeat CT scans showed progressive resolution of the brain lesions.

**Pathological Findings.** The routinely processed tissue revealed perivasculitis and nonspecific cerebritis, necrosis, and a few unusual cystic bodies, crushed and distorted. No granulomas or multinucleated giant cells were noted. However, the electron micrographs revealed several intact and very well preserved true cysts of *Toxoplasma gondii*. All of the specific ultrastructural features previously described in infected human brain\(^7\) were noted. The non-septated cysts varied greatly in diameter and were packed with numerous fusiform parasites (Fig. 1 left). These organisms measured 4 to 6 \(\mu\) in length, with the typical narrow anterior end (conoid) and a nucleus consistently located near the rounded posterior portion, all enclosed in a double-layered plasma membrane (Fig. 1 right). Abundant intracellular, dense starch storage granules were easily identified, as well as typical convoluted organelles (also called toxonemes). No cilia or basal bodies were present.

**Discussion**

The high prevalence of antibodies in the normal population to the coccidian *Toxoplasma gondii* indicates that it is a very common human parasite. Long known as a congenital infection associated with considerable morbidity, toxoplasmosis is also increasing as a threat to immunologically debilitated adults, including those with AIDS. Central nervous system toxoplasmosis is one of the most frequent opportunistic infections in Haitians, causing diffuse encephalopathy, meningoencephalitis, and/or brain abscess.\(^8\) Specific therapy may be quite effective if initiated promptly. However, since such patients may lack the typical lymphadenitic presentation or myocarditis and chorioretinitis, the proper diagnosis may not be clinically suspected. Neurosurgical biopsy and specific microscopic identification of the parasite is then necessary.

On routine microscopy, *Toxoplasma* may be con-
fused with other organisms including *Leishmania*, *Trypanosoma*, *Sarcocystis*, *Nosema*, and *Histoplasma*. Fortunately, the ultrastructure of all of these is distinctive, and electron microscopic examination of such cases is now a practical approach in many centers. Although the traditional electron microscopy techniques employed in most research environments consume several days in tissue processing, abbreviated procedures exist which may be applied to clinical diagnosis. Our case is an example of rapid, conclusive diagnosis by electron microscopy which led to the timely initiation of effective treatment.

References


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