EPIDEMIOLOGY

The tsetse fly, and consequently sleeping sickness, is confined to the central area of Africa between that continent’s two great deserts, the Sahara in the north and the Kalahari in the south. Approximately 50 million people live in this area, and 10,000 to 20,000 acquire sleeping sickness annually. Major outbreaks have been reported in several locations within the endemic area over the past two decades, partly as a result of the internecine wars in this area that have interrupted control programs. Although an estimated 20,000 Americans travel to endemic areas each year, less than two dozen cases of African trypanosomiasis have been diagnosed in Americans since 1967.

Riverine tsetse flies found in the forest galleries that border the streams of West and Central Africa serve as the vectors of the Gambian disease. Although these flies are not exclusively anthropophilic, humans are thought to be the major reservoir of the parasite. The infection rate in humans is affected by proximity to water but seldom exceeds 2% to 3% in nonepidemic situations. Nevertheless, the extreme chronicity of the human disease ensures its continued transmission.

Rhodesian sleeping sickness, in contrast, is transmitted by flies indigenous to the great savannas of East Africa that feed on the blood of the small antelope inhabiting these areas. The antelope serves as the major parasite reservoir, although human-to-human and cattle-to-human spread has been documented. Humans typically become infected only when they enter the savanna to hunt or to graze their domestic animals. Currently, Sudan is the only country where both the Gambian and Rhodesian forms of sleeping sickness are still found. At present, there is little evidence of coinfections with African trypanosomes and HIV, possibly because the former is primarily rural in distribution and the latter is concentrated in cities.

PATHOGENESIS

Multiplication of the trypomastigotes at the inoculation site produces a localized inflammatory lesion. After the development of this chancre, organisms spread through lymphatic channels to the bloodstream, inducing a proliferative enlargement of the lymph nodes. The subsequent parasitemia is typically low grade and recurrent. As host antibodies (predominantly IgM) are produced to the surface antigen characteristic of a particular parasitemic wave, they bind to the organism, leading to its destruction by lysis and opsonization. The trypomastigotes disappear from the blood, reappearing 3 to 8 days later as new antigenic variants arise. The recurrences gradually become less regular and frequent, but may persist for weeks to years before finally disappearing. During the course of the parasitemia, trypanosomes localize in the small blood vessels of the heart and central nervous system (CNS). This localization results in endothelial proliferation and a perivascular infiltration of plasma cells and lymphocytes. In the brain, hemorrhage and a demyelinating panencephalitis may follow.

The mechanism by which the trypanosomes elicit vasculitis is uncertain. The infection stimulates a massive, nonspecific polyclonal activation of B cells, the production of large quantities of immunoglobulin M (typically 8 to 16 times the normal limit), and the suppression of other immune responses. Most of this reaction represents specific protective antibodies that are ultimately responsible for the control of the parasitemia. Some, however, consist of nonspecific heterophile antibodies, antibodies to DNA, and rheumatoid factor. Antibody-induced destruction of trypanosomes releases invariant nuclear and cytoplasmic antigens with the production of circulating immune complexes. Many authorities believe that these complexes are largely responsible for the anemia and vasculitis seen in this disease.

AFRICAN TRYPANOSOMIASIS (SLEEPING SICKNESS): CLINICAL ASPECTS

MANIFESTATIONS

The trypanosomal chancre appears 2 to 3 days after the bite of the tsetse fly as a raised, red-denited nodule on one of the exposed surfaces of the body. With the onset of parasitemia 2 to 3 weeks later, the patient develops recurrent bouts of fever, tender lymphadenopathy, skin