

treatment is not given. The complexity of the immune response in malaria, the sophistication of the parasites' evasion mechanisms, and the lack of a good in vitro correlate with clinical immunity have all slowed progress toward an effective vaccine.

CLINICAL FEATURES

Malaria is a common cause of fever in tropical countries. Clinical diagnosis is notoriously unreliable. The first symptoms of malaria are nonspecific; the lack of a sense of well-being, headache, fatigue, abdominal discomfort, and muscle aches followed by fever are all similar to the symptoms of a minor viral illness. In some instances, a prominence of headache, chest pain, abdominal pain, cough, arthralgia, myalgia, or diarrhea may suggest another diagnosis. Although headache may be severe in malaria, the neck stiffness and photophobia seen in meningitis do not occur. While myalgia may be prominent, it is not usually as severe as in dengue fever, and the muscles are not tender as in leptospirosis or typhus. Nausea, vomiting, and orthostatic hypotension are common. The classic malarial paroxysms, in which fever spikes, chills, and rigors occur at regular intervals, are unusual and at presentation suggest infection (often relapse) with *P. vivax* or *P. ovale*. The fever is usually irregular at first (that of falciparum malaria may never become regular). The temperature of nonimmune individuals and children often rises above 40°C (104°F), with accompanying tachycardia and sometimes delirium. Although childhood febrile convulsions may occur with any of the malarias, generalized seizures are associated specifically with falciparum malaria and may herald the development of encephalopathy (cerebral malaria). Many clinical abnormalities have been described in acute malaria, but most patients with uncomplicated infections have few abnormal physical findings other than fever, malaise, mild anemia, and (in some cases) a palpable spleen. Anemia is common among young children living in areas with stable transmission (e.g., much of West Africa), and increases in prevalence where resistance has compromised the efficacy of antimalarial drugs. Frequent vivax malaria relapse is an important cause of anemia in young children in some areas (e.g., on the island