A Study of Falciparum Malaria in Vietnam Using Serum Quinine Concentrations

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OBJECTIVE: To obtain further information on the relation between quinine dosage schedules and the serum level of the drug in patients treated for acute falciparum malaria.

BACKGROUND: Recent work in Thailand has suggested that quinine dosage every 12 hours is optimal therapy in falciparum malaria. Therefore this hypothesis was tested in a group of Vietnamese patients with falciparum malaria. The value of using serum quinine concentrations was also investigated.

DESCRIPTION: The study was performed on patients with malaria admitted to an infectious diseases ward of a general medical hospital in Saigon, South Vietnam. The patients were self-referred and presented with "fever" as their main complaint. A positive diagnosis of falciparum malaria was made when the thin smear on admission showed characteristic appearances of an acute *P. falciparum* infection.

Patients studied received an initial 600 mg dose of quinine given IV over a period of four hours in 500 ml of 5% dextrose in saline. Some patients continued to receive IV quinine at 12 hour intervals followed by a single dose of Fansidar (three tablets), while other patients were given oral quinine at 12 hour intervals followed by a single dose of Fansidar. Blood was drawn and the serum separated for quinine determinations at 0, 4, 8, 12 and 24 hours following the first quinine dose and also after the last quinine dose was administered.

The duration of fever and parasitemia were recorded and the severity of the malaria and any side-effects of the quinine were noted during the course of treatment.

PROGRESS: In November and December 1974, a total of 19 patients were studied. There were 12 male and 7 female patients with an age range of 13 to 63 years and a mean age of 28 years.

The mean duration of fever was 1.7 days and of parasitemia 3.2 days. The percentage parasite count on admission ranged from 0.1% to 36.0%. Nine patients had a count of 1.0% or less, three patients were between 1-3%, and three patients had between 3-6% parasitemia. High parasite counts of 36.0%, 35.0%, 12.8% and 12.0% were found in four patients.

Two patients died. One of these was a 42 year old man who developed tachypnea on the second hospital day after receiving four doses of IV quinine at 12 hour intervals. He had a petechial rash on his face and limbs, gum bleeding and coughed up bloody sputum. His lungs were clear on auscultation and he was not orthopneic. His parasite count was 0.4%. The other patient was a 63 year old man with cerebral malaria and a parasite count of 35%. He became anuric, failed to respond to fluid loading and mannitol with furosemide and died before dialysis could be initiated. He received a single IV dose of 600 mg quinine in a four hour infusion.

Several patients developed mild nausea and vomiting and two patients developed sinus bradycardia which returned to normal sinus rhythm on stopping the quinine.

Serum Quinine Levels: Preliminary results are available. Patient No. 1 was aged 13 and weighed 29 Kg. He received 1200 mg quinine (a double dose) as his first dose. The serum quinine peaked at 18 mg per L at four hours after dosing and then decreased rapidly with a half-life of about six hours. The patient received a total of four doses of intravenous quinine every 12 hours followed by a dose of pyrimethamine with sulfadoxine (Fansidar). Following the last dose of quinine his serum level peaked at 12 mg per cent. Despite the satisfactory levels of serum quinine obtained, he returned with a positive smear on day 15.

Patient No. 22 was anuric. His serum quinine concentration peaked at 17 mg per L following the first dose of quinine. Despite the anuria, the serum quinine then decreased rapidly with an approximate half-life of about eight hours. When the serum quinine levels have been completed, an overall analysis will be presented.