of *P ovale* in sub-Saharan Africa takes place. Thus in the 2 years 1989–90, 69% of all cases of *P ovale* were imported from West African countries.[2]

The absolute requirement for visitors to malaria-endemic regions is that appropriate advice should be given about protection against mosquito bites and malaria chemoprophylaxis. Travellers should be made aware of the symptoms of malaria, and general practitioners the possibility of malaria in such a traveller.

We thank Dr D. Warhurst for the DNA analysis.

Departments of Haematology and Forensic Medicine, London Hospital Medical College, London E1 2AD, UK

CHRISTINE A. FACER
D. ROUSE

1. Warhurst DC, Awad El Kariem FM, Miles MA. Simplified preparation of malarial blood samples for polymerase chain reaction. *Lancet* 1991; 337: 303–07.
2. Bradley DJ, Warhurst DC, Blaze M, Smith V. Malaria imported into the United Kingdom 1989 and 1990. *Commun Dis Rep* 1991; 1: R45.

Reduction of coma by quinine loading dose in falciparum cerebral malaria

SIR,—Increasing *Plasmodium falciparum* resistance to chloroquine and severity of cerebral malaria have become a major problem in Yaoundé, Cameroon.[1] On the basis of pharmacokinetic indices in cerebral malaria,[2] a quinine infusion regimen (8 mg of quinine base/kg body weight over 1 h followed by 8 mg of base/kg over 7 h, then 8 mg/kg over 8 h three times daily for 3 days) was randomly allocated to 10 patients; 10 others received a standard regimen used in Cameroon (8 mg of base/kg over 8 h, three times daily for 3 days). Thick blood films were obtained every 3 h for the first 12 h and every 12 h thereafter. They were stained with Giemsa and examined for parasites.

All patients were African. They all had cerebral malaria and fulfilled the definition proposed by Warrell et al[3]—unrousable coma according to the Glasgow coma scale that was not attributable to other causes of encephalopathy, and *P falciparum* monospecific parasitaemia (> 2000 parasites/μl of whole blood).[4] Both treatment groups were similar with respect to age, body temperature, severity, and duration of coma on admission (table). All patients recovered and were discharged 3 days after admission. No obvious harmful effect was observed. In the loading-dose group, there was a significant decrease in the duration of coma, and the parasite clearance times were reduced by an average of 25% (table).

COMPARISON BETWEEN TREATMENT GROUPS ON ADMISSION AND AFTER START OF TREATMENT

—	iv quinine		p*
	Loading dose	No loading dose	
Mean age	24·2	22·1	NS
Rectal temperature on admission (°C)	39·8	39·8	NS
Glasgow score on admission	8·6	8·8	NS
Duration of coma before admission (h)	10·0	10·2	NS
Duration of coma after start of treatment (h)	6·8	13·0	0·003
Parasite clearance time (h)	40·8	52·2	0·05

*Non-parametric Mann-Whitney U test corrected for ties.
iv = intravenous, NS = not significant.

Davis et al[5] recommended the use of an intravenous quinine loading dose as being a safe and effective treatment. We are unaware of other reports of controlled trials of the clinical efficacy of a quinine loading dose, and our preliminary findings show its effectiveness and good tolerance. Our results need to be confirmed but they indicate the usefulness of this simple regimen as a treatment for severe malaria, even in places where intensive-care facilities are not available.

Intensive Care Unit, Hôpital Central de Yaoundé, Yaoundé — J.-J. FARGIER

Medical Entomology and Epidemiology Units, OCEAC/ORSTOM, BP288, Yaoundé, Cameroon — F. J. LOUIS, M. COT, B. MAUBERT

Hôpital Central de Yaoundé — C. HOUNSINOU

OCEAC/ORSTOM, Yaoundé — J.-P. LOUIS

Centre National de Référence pour la Chimiosensibilité du Paludisme, IMET, Paris, France — J. LE BRAS

Institut de Médecine Tropicale du Service de Santé des Armées, Marseille — J. E. TOUZE

1. Hengy C, Jambou R, Eberle F, et al. Problèmes thérapeutiques posés par la chimiorésistance de *P falciparum* aux antimalariques à Yaoundé, Cameroun. Abstracts of the VII International Congress of Parasitology, Paris. *Bull Soc Fr Parasitol* 1990; 8 (suppl 1): 430.
2. White NJ, Looareesuwan S, Warrell DA, Warrell MJ, Bunnag D, Harinasuta T. Quinine pharmacokinetics and toxicity in cerebral and uncomplicated falciparum malaria. *Am J Med* 1982; 73: 564–72.
3. Warrell DA, Looareesuwan S, Warrell MJ, et al. Dexamethasone proves deleterious in cerebral malaria: a double blind trial in 100 comatose patients. *N Engl J Med* 1982; 306: 313–19.
4. Warrell DA, Molyneux ME, Beales PF, eds. Severe and complicated malaria. *Trans R Soc Trop Med Hyg* 1990; 84 (suppl 2): 1–65.
5. Davis TME, Supanaranond W, Pukrittayakamee S, et al. A safe and effective consecutive-infusion regimen for rapid quinine loading in severe falciparum malaria. *J Infect Dis* 1990; 161: 1305–08.

Malaria, bednets, and mortality

SIR,—Dr Velema (Sept 7, p 642) suggests alternative explanations for the large impact on childhood mortality associated with the introduction of insecticide-treated bednets reported by us (June 22, p 1499). He questions the importance of malaria as a cause of death in The Gambia.

Velema accepts that insecticide-treated bednets may have prevented deaths caused by malaria. However, there was a further non-specific reduction in mortality, which we attributed to malaria acting as a risk factor for mortality due to other causes. This can be termed indirect mortality. Velema suggests that, rather than malaria being an indirect cause of death, the non-specific reduction in mortality might have resulted from weekly contact of children with village health workers (VHWs). In support of this he cites a study from Benin[1] in which children seen by a VHW had a lower risk of dying in the next 6 months than children not seen. This non-specific protective effect of contact with a VHW could not be related to any particular curative or preventive measure. It may be that unprompted contact with health services is a marker of health awareness and of a protective health-conscious attitude, rather than a protective measure per se.

In The Gambia, VHWs have few resources to exercise any direct curative action: their role in preventive medicine and health education is negligible. As we reported in our paper, the comparison of mortality rates in villages with and without the presence of a simple, village-based primary health care programme suggests that this scheme does not significantly reduce child mortality in The Gambia. A similar conclusion was drawn in a previous study.[2] We feel that the most likely explanation for the large reduction in

M 18