

# Initial treatment of severe malaria in Cameroonian children - likely problems of inadequate, improper, delayed or failed treatment

**To the Editor:** We read the recent article by Chiabi *et al.*<sup>1</sup> with keen interest and some surprise. Pre-admission medications were reportedly used for 287 patients (97%), of whom 59% (170) had used some form of antimalarials. Poor knowledge on the part of the mothers on how to identify the signs and symptoms of malaria and their inability to differentiate malaria from other causes of childhood fever<sup>2</sup> might explain the non-treatment of a significant number of the patients before hospital admission.

Pre-admission doses were reportedly adequate for 72% of the 170 patients who had been given some form of antimalarials, so inadequate treatment was very unlikely to have been the only cause of the severe malaria. Improper, delayed or failed treatments might have contributed to the number of cases reported.<sup>1</sup>

We were puzzled that the children were hospitalised and treated for severe malaria, yet the authors did not mention what antimalarials were used for their treatment during admission. However, we assumed that they were treated with parenteral quinine or artemisinin derivatives according to the World Health Organization (WHO) guideline.<sup>3</sup> Quinine and artemisinin-based combination therapies (ACT), in adequate doses, constituted the majority of the antimalarials used for home and primary health care management of the children studied by Chiabi *et al.*,<sup>1</sup> yet the children responded to treatment with these drugs while hospitalised. The quality of the pre-admission antimalarials must therefore be questioned. Counterfeit quinine is abundant in Cameroon<sup>4</sup> and the fake artemisinin derivatives that have dominated the Thai-Cambodian market<sup>5</sup> have gradually spread to some African countries.<sup>6</sup> Adequate systems for the monitoring of the quality of antimalarials in the marketplace may therefore be urgently required in Cameroon.

The source of the antimalarials used for self-medication in Chiabi *et al.*'s study<sup>1</sup> is very important. It is common practice for mothers to store medicines at home, especially antimalarials, in anticipation of malaria fever in their children.<sup>7,8</sup> The stability of medicines kept at home is known to decrease over time, especially in a warm climate, and a short shelf-life could increase treatment failure from loss of potency and possibly cause toxicity.<sup>8</sup>

Typical African diets are low in fat, an important factor for the absorption of several antimalarial compounds.<sup>9</sup> Although many studies from African countries have shown that the daily fat intake in children was well above the 1.2 g/day needed for appropriate absorption of lumefantrine,<sup>10</sup> sick children with malaria are often nauseous and will not eat, thus reducing their fat intake and possibly decreasing lumefantrine absorption.

Concomitant bacterial infections occur more frequently in children than adults and are associated with mortality.<sup>11</sup> This may explain the fact that 6.5% of children were treated with antibiotics before hospital admission. The consequent delayed

treatment of malaria in this group might have contributed significantly to the number of children hospitalised for severe malaria.

Lastly, traditional healers play a prominent role in treating African children with malaria, but unfortunately Chiabi *et al.*<sup>1</sup> did not explore this in their study. Children with severe malaria are often brought to hospital late because they have received treatment from healers,<sup>12</sup> as the parents strongly believe in traditional medicine.<sup>13</sup>

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**Dr Chiabi *et al.* reply:** We thank Drs Oshikoya and Senbanjo for their keen interest in our article<sup>1</sup> and for their valuable comments.

We agree that mothers' failure to identify signs of malaria and manage fever/malaria appropriately at home might explain the low rate (51%) of children given antimalarials at home. This situation is made worse by the fact that in Cameroon home-based treatment of malaria is often inconsistent with guidelines, as in many other African countries,<sup>2</sup> and the guidelines need to be effectively implemented across the whole country. In addition, as pointed out by Drs Oshikoya and Senbanjo, mothers need to be educated on the proper storage of drugs to preserve potency. A study by Chiaka *et al.*<sup>3</sup> found that 70% of parents did not respond promptly to early symptoms in their children, with a lapse of at least 3 days before consultation for fever; 90% of parents ascribed fever to teething problems and only 9% gave the right medication. In Uganda only 40% of mothers suspected malaria in their children, and of all the drugs given to children with fever only 50% were antimalarials.<sup>4</sup>

Although we did not report on the antimalarials used to treat the patients once they were in hospital, because our focus was on pre-admission treatment, all our patients were treated with parenteral quinine as recommended by the WHO guidelines and locally adapted by the Cameroon Ministry of Public Health.<sup>5</sup> Hospitalised patients with severe malaria in Cameroon are certainly not treated with counterfeit or fake quinine and artemisinin derivatives, but out-of-hospital treatment can be a problem as drugs of questionable quality are often obtained from street vendors and other illicit sources, as demonstrated by Basco.<sup>6</sup> Hospitalised patients obtain their drugs either from the hospital pharmacy, which stocks essential drugs supplied by the National Centre for Essential Drug Supply, or from the town pharmacies if the drug is not available in the hospital pharmacy.

We agree on the need for a drug quality control system, especially for antimalarials; the National Centre for Essential Drug Supply has set up such a system in Cameroon, but it needs to be reinforced. A vast campaign has been launched by the Cameroonian health authorities to get rid of roadside drug vendors and discourage trafficking across our borders.<sup>7-9</sup>

The comments on lumefantrine are very pertinent, and clinicians should always educate parents on the need to take antimalarials after meals, and avoid lumefantrine when a child will not eat or is vomiting.

In 72% of the children in our study pretreatment doses were adequate, which as Drs Oshikoya and Senbanjo point out indicates that initial treatment might have been otherwise inappropriate or incorrect, delayed or failed. However, we took 'adequacy' to mean that the dose being given at the time of admission was sufficient, and not necessarily that the treatment schedule was completed.

Treatment was improper because ACTs, which have been recommended in place of monotherapy by the Cameroon Ministry of Public Health for simple malaria since 2004, were administered in only 29.9% of the children. Simple malaria will certainly lead to severe malaria if untreated. Monotherapy was widely used before admission (in 51% of the children). Chloroquine was officially withdrawn from the drug market in Cameroon in 2002, so we were surprised that it was still available and continued to be given to patients by parents and some health personnel (see Fig. 5 of our article).

Failed treatment due to resistance could have occurred in our study, as emerging resistance to effective new antimalarials in Cameroon has been demonstrated by Mbacham *et al.*<sup>10</sup>

From our experience the role of traditional healers in the management of febrile illness or malaria in urban areas in Cameroon is not significant. A bigger problem is self-medication from doubtful sources, as pointed out by Basco,<sup>6</sup> and the many health posts occupied by unskilled personnel (which escape any official control), which compromise the proper management of childhood illnesses. Traditional medicines had been taken by only 4.3% of our patients.

Finally, we emphasise that ineffective initial treatment for severe malaria in Cameroonian children is multifactorial, with inappropriate, improper, delayed and failed treatment all playing a role. There is a need for appropriate education of communities and parents on the choice and source of drugs, rational drug use and home-based treatment, and timely presentation to health care services.

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