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Malaria case management in rural health centres in Burkina Faso and the risk of chloroquine self-medication

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Malaria is a major public health problem in Burkina Faso and accounts for 42% of outpatient consultations and 57% of hospitalisations with a peak during the rainy season. In Burkina Faso, as in many other developing countries, malaria is predominantly diagnosed clinically with fever as the leading symptom. Laboratory facilities to confirm the clinical diagnosis are not available in rural health facilities. The national guidelines therefore recommend that every febrile patient be diagnosed with malaria and be treated with AMDs. By doing so, overdiagnosis of malaria is tolerated in order to avoid missed malaria cases. Nevertheless, a full clinical assessment of every patient is recommended to avoid underdiagnosis of other diseases and unnecessary prescription of AMDs. Correct prescription is of great importance as underdosing may promote drug resistance and overdosing may cause adverse drug reactions. During the study period, the first-line drug for uncomplicated malaria was CQ. Meanwhile, the drug policy in Burkina Faso changed and ACT is the drug of first choice. However, this drug combination remains still mostly unavailable in rural areas.

Only a minor part of malaria patients is first treated in a public health facility and self-medication with widely available and cheap antimalarials such as CQ is frequent. Self-administered dosing is often not correct and may lead to either overdosing with the risks of adverse drug reactions or underdosing, which does not cure the disease and increases the risk of drug resistance. In addition, self treatment may interfere with the prescription at the health facility and thus result in toxic drug levels.

Objectives of this study were the assessment of the quality of HCWs' malaria diagnosis and treatment using the national guidelines (only presence of fever) and a gold standard (fever measured by the study physician and evidence of parasites in the patients' blood) as comparison. Further objectives were the assessment of patients' self-medication with CQ and their compliance with CQ prescription.

The study took place in five dispensaries in NHD, west Burkina Faso during the rainy season 2004. Assessment of HCWs' performance with regard to malaria diagnosis and treatment was done by direct observation of consultations using a checklist, which covered aspects of history taking, clinical examination, diagnosis, and prescription. All patients were reexamined by a study physician. In addition, every patient who gave oral consent had a blood smear for parasite search done. Those patients with *Plasmodium falciparum* parasites and fever (or history of fever) were considered as confirmed malaria cases (according to the national guidelines).

Confirmed cases with a parasite level $\geq 5000/\mu\text{l}$ were assessed for CQ whole blood concentration. This was done by taking blood on the day of consultation (day 1). A second blood sample was taken on day 14 in those patients who had received a CQ prescription. The samples were analysed for CQ whole blood concentration by HPLC.

We observed 1101 consultations and revealed that malaria case management in the study dispensaries has some weaknesses with regard to both diagnosis and treatment. Most patients were asked for previous treatment for the current illness episode although it was common practice to prescribe again a full CQ dosage instead of an appropriate second-line drug. Fever was the most frequent symptom asked for by the HCWs. Other symptoms of malaria, especially those of severe malaria were only rarely investigated.

Clinical examination usually included temperature taking. Febrile children were, however, rarely assessed for other diseases than malaria, such as respiratory symptoms. This may result in underdiagnosis of the underlying disease, such as pneumonia, another frequent febrile illness in childhood. Body weight was measured in only 41% of all patients, although most drugs are to be prescribed according to body weight. Missing body weight might have been a factor that contributed to the high percentage of wrongly prescribed CQ dosages in this study. The simple algorithm to diagnose every febrile patient with malaria was not always respected. Some patients were diagnosed clinically with malaria in the absence of fever and some febrile patients were not considered as malaria patients. In the subgroup of children under 5 sensitivity and specificity of the clinical diagnosis did not differ between the HCWs and the study physician. The physician's diagnosis was however more specific when looking at all patients.

A result of concern is that nearly one fourth of the confirmed malaria cases did not receive an AMD prescription. Although CQ was the most frequently prescribed drug, which was in accordance with the guidelines, dosing was often incorrect: 22% of the CQ prescriptions were overdosed and 12% underdosed.

Assessment of CQ whole blood concentration showed that on day 1, one fourth of the assessed patients (53/215) already had potentially toxic CQ levels. On day 14, very high concentrations were found in 46% of the patients (68/149). CQ prescriptions (partially overdosed) in addition to previous self-medication instead of a second-line drug resulted in these high drug levels.

The findings of our study are of great importance in a period of implementation of the new malaria drug policy in Burkina Faso. So far, ACT is not yet available in rural areas and CQ is still on the market. Therefore, self-medication with CQ is likely to continue. Clear recommendations to prescribe the second-line drug for patients who started treatment with CQ are a first step away from this drug and might reduce the risk of potentially toxic CQ concentrations. Training of HCWs such as in the frame of IMCI should stress the full clinical assessment of every febrile child in order to avoid underdiagnosis of febrile illnesses other than malaria. Targeting antimalarial treatment to those really infected is an issue in the period of change to ACT, which is much more expensive than CQ. Microscopes are currently the only appropriate option to confirm infection with *Plasmodium* in rural dispensaries in Burkina Faso. Microscopes are also of important value for the diagnosis of many other diseases. Introduction of such a diagnostic in dispensaries in Burkina Faso should, however, include precise guidelines what to do in the case of a negative slide and the laboratory service has to be organised in a way that HCW and patient can take the full advantage of this diagnostic method.