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Microscopy and outpatient malaria case management among older children and adults in Kenya

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Summary

OBJECTIVE To evaluate the accuracy of routine malaria microscopy, and appropriate use and interpretation of malaria slides under operational conditions in Kenya.

METHODS Cross-sectional survey, using a range of quality of care assessment tools, at government facilities with malaria microscopy in two Kenyan districts of different intensity of malaria transmission. All patients older than 5 years presenting to outpatient departments were enrolled. Two expert microscopists assessed the accuracy of the routine malaria slide results.

RESULTS We analysed 359 consultations performed by 31 clinicians at 17 facilities. Clinical assessment was suboptimal. Blood slide microscopy was performed for 72.7% of patients, who represented 78.5% of febrile patients and 51.3% of afebrile patients. About 95.5% of patients with a positive malaria microscopy result and 79.3% of patients with a negative result received antimalarial treatment. Sulphadoxine–pyremethamine monotherapy was more commonly prescribed for patients with a negative test result (60.7%) than for patients with a positive result (32.4%). Conversely, amodiaquine or quinine were prescribed for only 14.7% of patients with a negative malaria microscopy result compared to 57.7% of patients with a positive result. The prevalence of confirmed malaria was low in both high (10.0%) and low-(16.3%) transmission settings. Combining data from both settings, the sensitivity of routine microscopy was 68.6%; its specificity, 61.5%; its positive predictive value, 21.6% and its negative predictive value, 92.7%.

CONCLUSIONS The potential benefits of microscopy are currently not realised because of the poor quality of routine testing and irrational clinical practices. Ambiguous clinical guidelines permitting treatment of older children and adults with a negative blood slide also undermine rational use of antimalarial drugs.

keywords malaria, microscopy, interpretation, accuracy, Kenya

Introduction

In malaria endemic areas of Africa, the rates of severe disease and death due to *Plasmodium falciparum* malaria decline rapidly over the first 5 years of life (Snow & Marsh 1998). The incidence of mild clinical attacks declines more slowly but there is a threefold lower rate of disease among children aged 5–14 years compared to children aged 0–4 years (Snow *et al.* 2003) and incidence is generally very low in adults (Trape & Rogier 1996; WHO 2000; Snow *et al.* 2003). Despite the lower risk of uncomplicated malaria among populations aged more than 5 years, the absence of valid clinical predictors to diagnose malaria in this age group (Genton *et al.* 1994; Chandramohan *et al.* 2001; Mwangi *et al.* 2005) has lead to frequent recommendations promoting presumptive malaria diagnosis for all febrile older children and adults across most malaria endemic areas of Africa (WHO 2000,2003a). Such recommendations and current diagnostic practice result in a massive over-diagnosis of malaria (Font *et al.* 2001; Amexo *et al.* 2004).

Arguably over-diagnosis and over-treatment has been tolerated when conventional first-line drugs such as chloroquine and sulfadoxine–pyrimethamine (SP) were inexpensive and safe. With increased treatment failure rates to most of the first-line therapies in East and Southern Africa (East African Network for Monitoring of Antimalarial Treatment (EANMAT) 2003; Myint *et al.* 2004; Talisuna *et al.* 2004) new drugs that are more expensive, more complex to use and with less certain safety-margins, such

as artemisinin-based combination therapies (ACT), are gradually being introduced across Africa (WHO 2001a; Bosman & Olumese 2004). In the era of ACT, the presumptive diagnosis and treatment of patients without malaria becomes economically and clinically less acceptable. While it seems reasonable to continue presumptive treatment among children 0–4 years living in high-malaria transmission settings, for older children and adults parasite-based diagnosis is likely to be the only potential solution to increase diagnostic specificity (Nosten & Brasseur 2002; Barnish *et al.* 2004).

During the 1990s the Kenyan Ministry of Health (MoH) expanded microscopic diagnostic services into nearly all government hospitals and health centres (Ministry of Health 2001). However, there have been relatively few attempts to examine the influence of microscopy on malaria diagnosis and treatment practices in older children and adults where it might be most useful (Barat & Kramer 1999). In this paper, we present an observational study on the effects of microscopy on outpatient malaria case management among patients above 5 years and the accuracy of routine malaria slides.

Methods

Study sites

Two districts representing different malaria ecologies in Kenya were purposively selected to reflect the two common malaria transmission settings in Kenya. The first district was Kwale, a hyper- to holo-endemic area along the Indian Ocean coast and below 650 m altitude with 48 government health facilities of which 14 had functional microscopy in 2002. The prevalence of *P. falciparum* infection reported from four community-based surveys undertaken in August 2003 in children <5 years of age ranged from 55.1 to 87.0% (V. Marsh, unpublished data). The second district was Greater Kisii, supporting hypo- to meso-endemic transmission and located in the Western highlands at altitude between 1400 and 2200 m with 10 of 48 government facilities with functional microscopy in 2002. The prevalence of *P. falciparum* infection reported from six community-based surveys undertaken between March and May 2000 in children <5 years of age ranged from 3.1 to 17.7% (D. Zurovac, unpublished data). The study was conducted during malaria seasons between August–September 2002 in Kwale and March–April 2003 in Greater Kisii.

Study design and data collection

We studied outpatient malaria case management practices in patients above 5 years of age using a cross-sectional, cluster sample survey at randomly selected facilities with functional microscopy. A cluster was defined as all older children and adult outpatient consultations occurring at each facility over two consecutive survey days. Data were collected using quality of care assessment methods (WHO 2002) modified for the present study including: observation of consultations, independent re-examination of each patient, malaria blood slide examination and interviews with health workers. After the patient or caretaker provided informed written consent, one surveyor silently observed all consultations and recorded the performance of various clinical tasks. The observed health worker performed consultations and recorded the patient's clinical notes, laboratory requests and results, diagnosis and treatment on a blank study form. When the patient left the consultation room the study physician, blind to the findings of the first consultation, performed a structured clinical re-examination recording clinical findings on a separate study form and in the patient-held cards. The study physician was responsible for patients' clinical management plans. When a blood smear was requested during the initial health worker consultation a further study malaria thick smear was prepared from the same finger prick, stained with Giemsa 10% and taken by the study team for later, expert examination. Finally, at the end of the second survey day at each facility interviews were conducted with health workers to collect basic information on their demographics, pre-service training and working experience.

Approximately 2 months after the facility surveys two independent expert microscopists examined study slides at KEMRI/Wellcome Trust laboratories in Nairobi, without any knowledge of the results from the routine clinical slide. For each slide 100 high-power magnification fields were examined before the slide was regarded as negative. Where results between the two expert microscopists were discordant, a third microscopist reread the blood slide and the majority decision was accepted as the final result. The KEMRI national ethical review committee provided ethical clearance for this study (reference no. 681).

Data entry, definitions and statistical analysis

Data were double-entered and verified using Access 2000 (Microsoft Inc, Redmond, WA, USA) through customised data-entry screens with range and consistency checks and analysis was performed using STATA, version 8 (Stata-Corp, College Station, TX, USA). The precision of proportions (95% confidence interval) was estimated accounting for the cluster sampling design using the health facility as the primary sampling unit. The analysis was performed for each district separately and for two districts combined. Our primary analysis was on febrile patients

presenting for an initial consultation without signs of severe disease. A patient was considered to have fever if during the re-examination a history of fever was reported in the last 48 h or axillary temperature was ≥37.5 °C. A patient's initial visit was defined during the re-examination as the first visit to this facility for the presenting illness episode. Treatment as an outpatient by the facility clinician was used as proxy for non-severe disease. Clinical assessment tasks were judged as performed if health worker asked about the presence of symptom, the patient spontaneously reported the symptom or the observer could obviously tell the patient had the information of interest. The sensitivity, specificity and positive and negative predictive values (NPV) of the routine reading of malaria slides were calculated against the gold standard of any parasitaemia defined by concordant findings from two expert microscopists. The positive likelihood ratio was calculated according to the following formula: sensitivity/1-specificity.

Ethical approval

The KEMRI national ethical review committee provided ethical clearance for this study (reference no. 681).

Results

Description of the survey sample

We assessed 478 outpatient consultations for patients aged above 5 years seen by 31 health workers at 17 health facilities with functional microscopy in two districts. No health workers or patients refused to participate in the survey. Of 478 consultations, the exit examination could not be performed for 42 patients (8.8%) and these patients were excluded from the analysis. Of the remaining 436 patients, 27 patients were attending a follow up visit, 23 were referred for hospitalisation and 27 had missing values that prevented definite classification as an outpatient during an initial visit. Our final analysis therefore, includes 359 patients, 203 (56.6%) from Kwale and 156 (43.5%) from Greater Kisii. Nearly half of consultations (47.1%) were performed at sub-district hospitals, 37.3% at health centres and 15.6% at dispensaries. The majority of the patients were above 15 years of age (79.7%) and the majority of consultations were performed by clinical officers (61.0%) rather than nurses (36.5%).

Characteristics of clinical assessment

For 359 consultations analysed, mean and median consultation time was 4.7 and 4.0 min, respectively. Health workers routinely assessed 61.0% (95% CI: 47.2–75.0) of patients for a history of fever, yet only 16.4% (95% CI: 3.7–29.1) had a temperature routinely measured. Conjunctival pallor was checked for 60.6% (95% CI: 52.3–68.8) of patients. Cough was assessed in 36.8% (95% CI: 30.7–42.9) of patients. The following clinical tasks were performed in 13.9–21.7% of patients: assessment of chest pain, diarrhoea and vomiting; auscultation of chest and palpation of spleen. Less than 6% of patients had the following tasks performed: assessment of difficult breathing, ear problem, running nose and throat pain; measurement of respiratory rate; and inspection of throat and ears. No significant difference in performance of any task was observed between the districts or groups subsequently categorized as referred for routine microscopy or not, or if categorized according to the result of the routine blood slide (positive and negative).

Use and interpretation of malaria slide

Figure 1 shows the district-specific pattern of current routine clinical practice at the 17 health facilities on the use and interpretation of blood slide results with respect to the presence of fever and prescription of antimalarial treatment. The proportion of patients coming for an initial visit and treated as outpatients who reported a history of fever or who had an axillary temperature ≥37.5 °C was 78.8% (95% CI: 73.0–84.7) with no significant difference between the two districts. Overall, 261 patients (72.7%, 95% CI: 60.8–84.6) had a malaria slide performed, more commonly in Greater Kisii (90.4, 95% CI: 85.1–95.6) than in Kwale (59.1, 95% CI: 44.4–73.8). Only 26 (9.1%) patients were referred for microscopy but did not have a blood slide done. Among all patients with fever, a malaria slide was performed for 78.5% of patients (95% CI: 69.5–87.4), however, 51.3% (95% CI: 28.4–74.2) of all patients without fever also had a blood slide performed. Among all patients who had a blood slide performed 42.5% (95% CI: 30.5–54.6) had a positive blood slide reported through routine microscopic practices. A positive routine malaria slide was more commonly reported in Greater Kisii (56.0, 95% CI: 41.2–70.8) than in Kwale district (26.7, 95% CI: 16.7–36.6). Interestingly, among the 39 patients without fever that had a routine blood slide at the health facility, 12 (30.8%) were reported as positive but none were confirmed as positive on the examination of the study slides by the expert microscopists.

Nearly all patients with a routinely reported positive malaria slide received antimalarial treatment (95.5, 95% CI: 91.3–99.7), however, health workers prescribed an antimalarial treatment for 79.3% (95% CI: 65.8–92.9) of patients with a routinely reported negative slide.

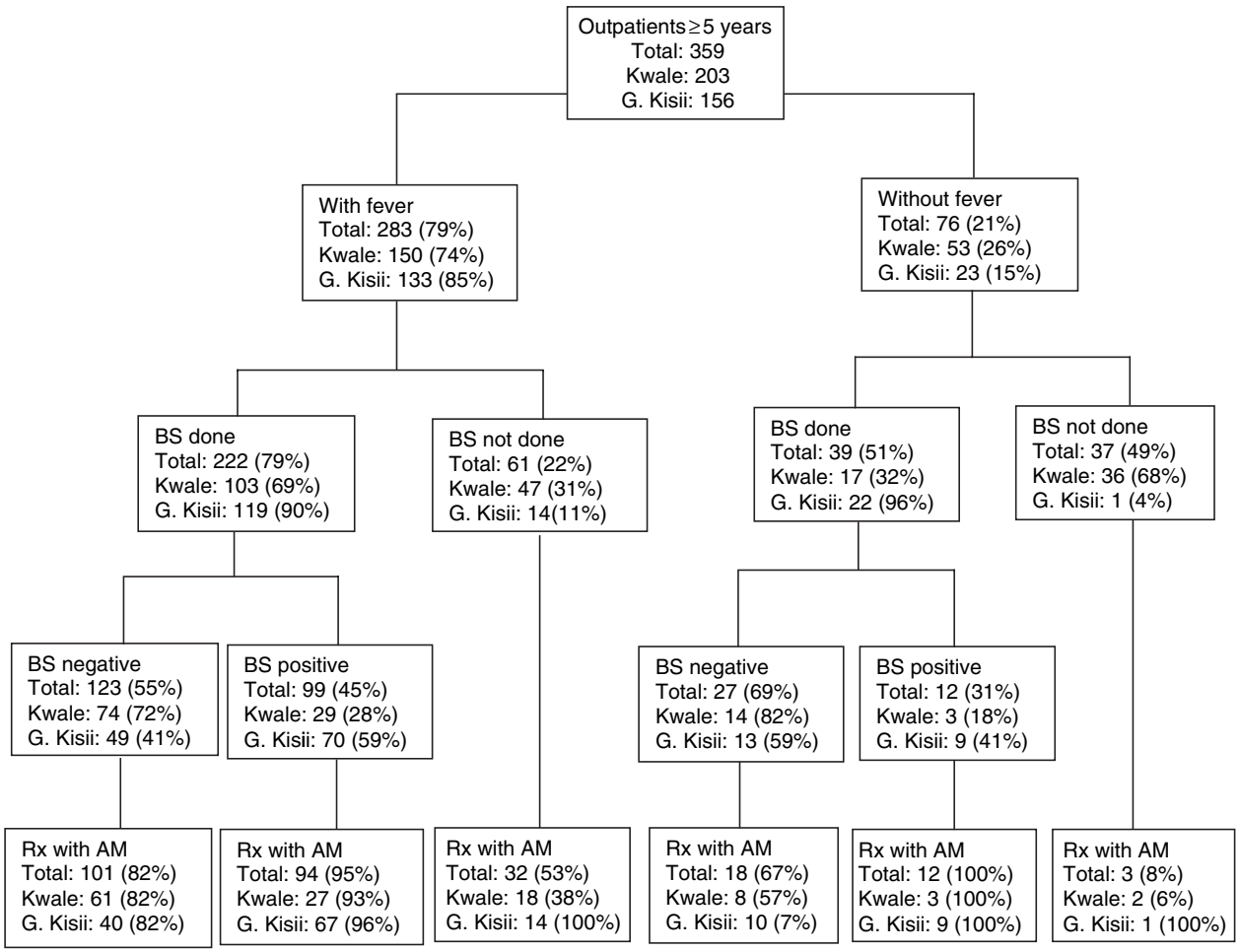

Figure 1 The clinical process for older children and adults presenting to 17 health facilities with a functional microscopy indicating the use and interpretation of blood slide (BS) results with respect to the presence of fever and treatment (Rx) with an antimalarial (AM) drug: results from districts of high (Kwale) and low (Greater Kisii) malaria transmission in Kenya.

Variability of this practice between individual clinicians could not be meaningfully compared because of the small number of observations per clinician, however, all clinicians were observed to ignore some negative results. Significantly fewer patients who did not have a malaria slide performed had an antimalarial drug prescribed (35.7, 95% CI: 19.2–52.2). There was no significant difference observed in the prescription of antimalarial treatments for a routine negative malaria slide between the two districts: 78.4% (95% CI: 54.9–100) of patients in Kwale district and 80.6% (95% CI: 68.7–92.6) in Kisii district had antimalarial drugs prescribed.

A significant difference was observed in treatment practices depending on the blood slide result (Table 1). The SP monotherapy, recommended first line therapy for uncomplicated malaria in Kenya, was more commonly prescribed in patients with a negative malaria slide (60.7, 95% CI: 48.5–72.8) than in patients with a positive slide (32.4, 95% CI: 19.9–45.0). Conversely, second-line drugs were more commonly prescribed for patients with positive slide reports than for patients with a reported negative malaria slide (Table 1). Amodiaquine or quinine, either as monotherapies or in combination with other antimalarial drugs, were prescribed for only 14.7% (95% CI: 4.4–24.9) of patients with a negative slide compared to 57.7% (95% CI: 44.0–71.4) of patients with positive slide. The similar pattern in the use of first and second line drugs with regard to routine reports of positive and negative slides were observed in both districts and no statistically significant difference has been demonstrated between the districts.

Table 1 Prescriptions for older children and adults treated as outpatients following an initial visit according to the routine results of blood slides (BS)

	BS positive ($n = 111$)		BS negative ($n = 150$)		BS not done ($n = 98$)		Total ($n = 359$)	
Treatment prescribed	No	(%)	No	(%)	No	(%)	No	(%)
SP*	36	32.4	91	60.7	19	19.4	146	40.7
Amodiaquine†	38	34.2	16	10.7	10	10.2	64	17.8
Quinine†	13	11.7	5	3.3	2	2.0	20	5.6
SP + quinine	6	5.4	0	0	0	0	6	1.7
SP + chloroquine	4	3.6	3	2.0	3	3.1	10	2.8
Amodiaquine + quinine	3	2.7	0	0	0	0	3	0.8
SP + amodiaquine	2	1.8	1	0.7	0	0	3	0.8
Artemisinins	2	1.8	1	0.7	0	0	3	0.8
Chloroquine + amodiaquine	2	1.8	0	0	1	1.0	3	0.8
Proguanil	0	0	2	1.3	0	0	2	0.6
No antimalarial treatments	5	4.5	31	20.7	63	64.3	99	27.6
Antipyretic prescribed	106	95.5	137	91.3	69	70.4	312	86.9
Antibiotic prescribed	57	51.4	88	58.7	62	63.3	207	57.7

* Sulfadoxine–pyrimethamine (SP) is nationally recommended first-line drug for uncomplicated malaria.
† Amodiaquine and quinine are nationally recommended second-line drugs for uncomplicated malaria.

There was a high use of antipyretics and antibiotics irrespective of whether the slide was reported as positive (95.5 and 51.4%, respectively), negative (91.3 and 58.7%, respectively) or not requested (70.4 and 63.3%, respectively).

Accuracy of routine malaria microscopy

An additional study slide was prepared for 261 patients who had a routine malaria slide performed and was read by two expert microscopists during the post-survey work. The slide positivity rate of expert microscopy was 13.4% (95% CI: 7.8–19.0), without significant difference between the districts of high and low-malaria transmission: 10.0% (95% CI: 6.1–13.9) of blood slides in Kwale district and 16.3% (95% CI: 6.1–26.5) in Greater Kisii district were malaria positive on the expert microscopy.

Using data pooled across both districts the sensitivity and the specificity of the routine blood slide results for identifying a positive blood slide by expert microscopy were 68.6% (95% CI: 55.2–82.0) and 61.5% (95% CI: 48.6–74.5), respectively. The positive predictive value (PPV) was very low, 21.6% (95% CI: 10.4–32.9) while the NPV was high, 92.7% (95% CI: 89.7–95.6). No significant difference in predictive values was observed between districts: the PPVs were 18.8% (95% CI: 9.0–28.5) and 22.8% (95% CI: 4.2–41.4) in Kwale and Greater Kisii districts, respectively, while the NPVs were 93.2% (95% CI: 90.0–96.3) and 91.9% (95% CI: 85.4–98.4), respectively. The positive likelihood ratio was low in both districts (2.08 in Kwale and 1.50 in Greater Kisii), as well as in the two districts combined (1.82). The results on the accuracy of the routine microscopy across two districts are presented in Table 2.

Discussion

Parasite-based diagnosis of malaria is receiving renewed attention in the face of widespread deployment of new more expensive drugs with possibly lower safety margins (Nosten & Brasseur 2002; Amexo *et al.* 2004; Barnish *et al.* 2004). Our study in 17 health facilities with functional microscopy in Kenya in two areas of different malaria transmission showed that malaria microscopy was commonly used among older children and adults. However, clinical indications for its use were frequently inappropriate: over half of patients without evidence of fever were referred for microscopy, and despite the laboratory reporting that 31% of these patients had evidence of infection this was not confirmed in any case by expert examination of a parallel slide. Furthermore, while nearly all routine reports of positive slides were treated for malaria (96%), the clinical interpretation of negative malaria slide results was characterised by an overwhelming tendency to ignore the result and prescribe an antimalarial (79%). These findings are consistent with observations made in Benin (Holtz & Kachur 2000), Zambia (Barat *et al.* 1999) and Bungoma district in Kenya (Barat & Kramer 1999).

There are a number of possible explanations for this practice. First, prescribers may view blood slide diagnosis

Table 2 The slide positivity rate and the accuracy of routine malaria microscopy compared to a gold standard microscopy: results from 17 health facilities across two districts of different malaria transmissions in Kenya

	Kwale (high transmission)			Greater Kisii (low transmission)			Total		
	No/N	%	95% CI	No/N	%	95% CI	No/N	%	95% CI
Slide positivity rate (routine microscopy)	32/120	27	17, 37	79/141	56	41, 71	111/261	43	31, 55
Slide positivity rate (expert microscopy)	12/120	10	6, 14	23/141	16	6, 27	35/261	13	8, 19
Sensitivity	6/12	50	19, 81	18/23	78	64, 93	24/35	69	55, 82
Specificity	82/108	76	68, 84	57/118	48	28, 68	139/226	62	49, 75
Positive predictive value	6/32	19	9, 29	18/79	23	4, 41	24/111	22	10, 33
Negative predictive value	82/88	93	90, 96	57/62	92	85, 98	139/150	93	90, 96
Positive likelihood ratio	2.08			1.50			1.82		

more as a tool to confirm their clinical suspicion rather than to rule out malaria. In support of this possibility we observed that an antimalarial treatment is more commonly prescribed for patients with a blood slide performed compared to patients without a blood slide. Second, a malaria diagnosis and treatment may be simply a 'convenient' clinical strategy avoiding the more complicated search for other causes of the presenting illness. In our study patients with a negative slide were more likely to be prescribed SP compared to patients with a positive slide who were commonly prescribed second-line treatments and we could not demonstrate that assessment practices were more thorough for patients with reported negative slide compared to patients with positive slide result. Third, clinicians may doubt the quality of microscopy leading to a lack of confidence when a negative malaria slide result is reported. Our observation was that the NPV of routine microscopy was high (93%), which should provide some confidence among prescribers that negative slides are truly negative. Although this in part reflects the fact that in both high and low-transmission settings studied the prevalence of confirmed malaria was low in these age groups.

The low prevalence of 'true malaria' in both transmission settings in those aged 5 or more years (10% in the high-transmission area and 16% in the low-transmission area) also in part explains the low PPV of routine microscopy for detecting true malaria in both settings. Thus approximately four of five routinely reported positive slides were in fact negative. These findings are similar, to those from a recent study in Tanzania where the positivity rate of research slides among patients >5 years of age admitted to hospital with severe malaria did not differ between lowland, high (19%) and highland, low (22%) malaria transmission settings (Reyburn *et al.* 2004). However, while the low prevalence of true malaria helps explain the low PPVs there is clearly a major problem with the quality of routine microscopy. Even at a prevalence of true malaria of 10% the PPV of routine microscopy could rise to 50% with a positive likelihood ratio of 9 if routine microscopy was 90% sensitive and 90% specific compared with gold standard microscopy – not an unreasonable standard for a laboratory quality assurance scheme. We acknowledge that the age is likely to have further effect on the prevalence of 'true malaria' and predictive values, however, a small number of observations in older children 5–14 years, precluded any meaningful comparisons with adult patients.

Finally we would like to emphasise the potential role of ambiguous national guidelines. They state that *'in certain cases a slide may be negative even when the patient has malaria'* (Ministry of Health 1998). Similar recommendations can be found in international guidelines (WHO 2003a) and similar instructions continue to be promoted for the interpretation of malaria rapid diagnostic tests (WHO 2003b). Such ambiguous statements undermine the purpose of introducing diagnostics aiming to promote rational drug use. Changing international and national guidelines, at least for older children and adults in whom the risk of disease is rapidly declining, seems a pre-requisite to improving the value of diagnostic services in malaria case management.

Effective change of current diagnostic behaviour might yield significant savings on antimalarial drug costs. In one hospital in Malawi the introduction of microscopic diagnosis for adult patients accompanied by instructions to respect negative results produced annual savings of 3% of the hospital's overall annual drug budget (Jonkman *et al.* 1995). In Kenya, artemether-lumefantrine (AL), characterised by a 30-fold more expensive adult treatment course compared to SP, has been announced as the new first line treatment for uncomplicated malaria (Ministry of Health 2004). A single change of diagnostic practice, respecting negative parasitological results, could produce significant savings under AL treatment policy in Kenya even if the

accuracy of microscopy was not improved. However, our study suggested that such change of practice would be done at the cost of reducing sensitivity for identifying true cases by 31% and would result in 1 of 24 outpatients above 5 years of age being sent home without an antimalarial drug when they are in fact parasitaemic. The risks of such a trade-off are essentially unknown, however, they might be expected to be low in older children and adults with uncomplicated malaria who are considerably less vulnerable to developing severe, potentially fatal complications.

The ideal solution, reducing the risk of failure to treat true cases and creating even more significant antimalarial drug cost savings would be improvement in the accuracy of malaria microscopy accompanied by a change of diagnostic practice. An ideal 100% accuracy of malaria microscopy is probably an unrealistic target under field conditions. Sensitivities and specificities of above 90% are more realistic and sufficiently acceptable targets to justify interventions focusing on a change of clinical diagnostic practice. Improvements of accuracy of malaria microscopy present a challenge for currently poorly functional laboratory services in Kenya. However, the recent positive experiences reported from Ghana suggest that significant nationwide improvements in the accuracy of malaria microscopy can be achieved (Bates *et al.* 2004). Improvements in diagnostic services would then need to be translated into improved clinical practice, particularly with regard to respect for negative slide results. Change of any clinical practice is a challenging task and interventions have been variously successful (Ross-Degnan *et al.* 1997; WHO 2001b), however, several recent studies suggest that improving the quality of outpatient care in Africa is possible (Armstrong-Schellenberg *et al.* 2004; Gouws *et al.* 2004). Combining laboratory and clinical improvements would appear to have great scope for reducing antimalarial drug costs in the era of ACTs.

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Microscopie et prise en charge des patients malariques ambulatoires chez les enfants plus âgés et les adultes au Kenya

OBJECTIF Evaluer la précision de la lecture des lames et de l'interprétation des résultats dans la microscopie de la malaria sous des conditions opérationnelles.

MÉTHODES Etude transversale basée sur une série d'outils d'évaluation de la qualité de la prise en charge dans des services gouvernementaux réalisant une microscopie pour la malaria, dans deux districts du Kenya avec différentes intensités de la transmission de la malaria. Tous les patients de plus de 5 ans se présentant dans le département des patients ambulatoires ont été inclus dans l'étude.

RÉSULTATS 359 consultations ont été réalisées par 31 cliniciens dans 17 services. L'évaluation clinique était sub-optimale. Une microscopie de frottis sanguin a été effectuée pour 72,7% des patients représentant 78,5% des patients fébriles et 51,3% des patients non fébriles. 95,5% des patients avec frottis microscopiquement positif et 79,3% des patients avec un frottis négatif ont reçu un traitement antimalarique. La monothérapie à sulphadoxine-pyremethamine était plus couramment prescrite pour les patients avec un test négatif (60,7%) que pour les patients avec un test positif (32,4%). Cependant, l'amodiaquine ou la quinine était prescrite chez seulement 14,75% des patients avec un test négatif comparé à 57,7% des patients avec un test positif. La prévalence de malaria confirmée était faible autant dans la région à haute (10,0%) que dans celle à faible (16,3%) transmission de la malaria. D'après les données combinées des deux endroits, la sensitibilité de la microscopie en routine était de 68,6%, sa spécificité 61,5%; sa valeur prédictive positive 21,6% et sa valeur prédictive négative 92,7%.

CONCLUSION Les bénéfices potentiels de la microscopie ne sont pas actuellement atteints à cause de la faible qualité du test de routine. En plus, les directives cliniques ambiguës pour le traitement des enfants moins jeunes et des adultes à frottis sanguins négatifs compromettent l'usage rationnel des médicaments antifébriles.

mots clés malaria, microscopie, interprétation, précision, Kenya

Manejo microscópico y en consultas externas de casos de malaria en niños y adultos en Kenia

OBJETIVO Evaluar la exactitud de la lectura por microscopía de láminas para malaria, y la interpretación correcta de los resultados, bajo condiciones operacionales en Kenia.

MÉTODOS Estudio croseccional, utilizando una serie de herramientas para evaluar la calidad, en centros gubernamentales con microscopía para malaria en dos distritos de Kenia con diferente intensidad de transmisión de malaria. Todos los pacientes de más de 5 años que se presentaron en consultas externas fueron incluidos en el estudio. Dos microscopistas expertos evaluaron la exactitud de los resultados de las lecturas de rutina de las láminas.

RESULTADOS Analizamos 359 consultas realizadas por 31 clínicos en 17 centros. La evaluación clínica fue deficiente: se realizaron láminas a 72.7% de los pacientes, que representaban un 78.5% de los pacientes con fiebre y 51.3% de los pacientes sin fiebre. Un 95.5% de los pacientes con un resultado positivo en la lectura de la lámina por microscopía y un 79.3% de los pacientes con un resultado negativo, recibieron tratamiento antimalárico. La monoterapia con sufadoxina-pirimetamina más comúnmente prescrita a pacientes con una resultado negativo en la lectura de la lámina (60.7%) que a pacientes con un resultado positivo (32.4%). Por otro lado, la amodiaquina o la quinina fueron prescritas a solo un 14.7% de los pacientes con un resultado negativo por microscopía, comparado con un 57.7% de los pacientes con un resultado positivo. La prevalencia de malaria confirmada fue baja, tanto en áreas de alta (10.0%) como de baja (16.3%) transmisión. Al combinar los datos de ambos lugares, la sensibilidad de la microscopía de rutina fue del 68.6%; la especificidad del 61.5%; su valor predictivo positivo, 21.6% y su valor predictivo negativo, 92.7%.

CONCLUSIONES Los beneficios potenciales de la microscopía no son actualmente evidentes debido a la mala calidad de las pruebas de rutina. Unas guías clínicas ambiguas que permiten el tratamiento de niños mayores y adultos con una lámina negativa, también debilitan el uso racional de los medicamentos para malaria.

palabras clave malaria, microscopía, interpretación, exactitud, Kenia