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Case Report of a Patient with Recrudescent Malaria in Rural Kenya

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Abstract

A patient in rural Kenya presented with recurrent smear-positive non-severe malaria, despite multiple re-treatments with both oral and parenteral artemisinin-base combination therapies. Recrudescence of *P. falciparum* malaria was deemed the most likely explanation, and radical treatment with Primaquine was finally done, with subsequent remission of malaria symptoms and negative follow-up laboratory tests.

Keywords: *Smear-Positive Malaria, Recrudescence, Artemisinin, Primaquine*

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Case Summary

A 55-year-old woman from Rift Valley area of Kenya with history of well controlled hypertension was first treated for clinically symptomatic non-complicated blood-slide smear-positive malaria in December 2020 with oral artemether-lumefantrine (AL) combination therapy for 3 days (see attached images 1 and 2 for the blood slide for malaria parasites done on her). 12 months later, she tested positive for malaria again, and would subsequently test positive 5 more times during monthly follow-ups, presenting with non-complicated manifestations each time: fevers of up to 39.5^{o}C, chills and rigors, joint pains, muscle aches, anorexia with no vomiting, and headaches. The blood pressures remained normal throughout, with unremarkable physical examination findings.

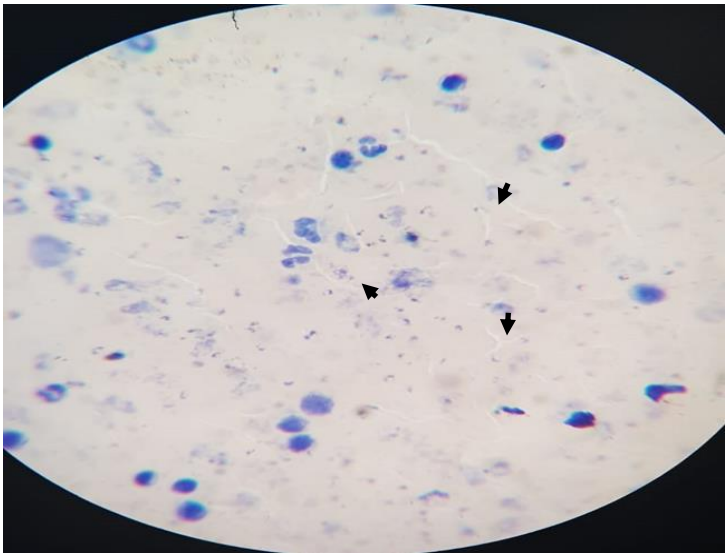

Image 1: Trophozoites of P. falciparum Malaria Are Seen as Ring-Shaped, Headphone-Shaped, and or Comma-Like Structures (Black Arrow-Heads) in This Thick Smear under Oil Immersion Microscopy at X100

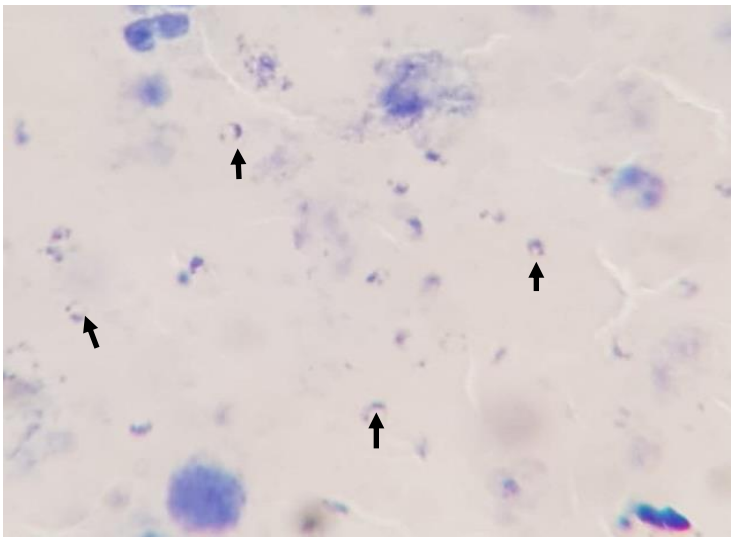

Image 2: Zoomed-Out Image 1 Showing the P. falciparum Trophozoites as Ring-Shaped, Head-Phone Shaped or Comma-Shaped (Black Arrows)

Her latter treatment involved various artemisinin-base combinations, including 3 days of oral Artemether-Lumefantrine @4 tablets twice daily, 3 days of oral Dihydroartemisinin-Piperaquine @3 tablets once daily (no vomiting reported on the oral therapy), 7 days of intramuscular Artemether with loading dose @3.2mg/kg body weight, followed by daily maintenance dose @1.6mg/kg, and 7 days of intravenous Artesunate @2.4mg/kg body weight at 0, 12, and 24 hours then daily; on different occasions as both inpatient and outpatient. Her symptoms would completely resolve after each course of treatment, only to recur 2-3 weeks later. She never travelled out of Kenya during this time, was adherent to treatment (administered in the wards and by her adult daughter at home), slept under insecticide-treated mosquito net, and lived in a flat with no bushes or stagnant water points around her house. No other persons from her flat or neighborhood was treated for malaria during a similar period. She had no other comorbidities, was HIV-negative, with normal complete blood count, random blood sugar, liver and renal functions, and normal liver and spleen on ultrasound. She was diagnosed with recrudescent malaria, and treated with oral Primaquine @30mg daily for 2 weeks. All her symptoms resolved, and she's repeatedly tested negative for malaria since then.

Discussion

Patients may have recurrence of malaria due to recrudescence, relapse or re-infection. Recrudescence occurs when repeated malaria attacks are the result of survival of the malaria parasites in blood. The parasites remain undetected in bloodstream due to ineffective treatment, poor host immune responses, or both. This usually happens within days or weeks. Relapse is the recurrence of the disease after it has apparently been cured [1, 2]. In this case, new blood stage parasites (merozoites) are released from dormant liver stages (hypnozoites) to cause symptomatic peripheral parasitemia. This usually occurs within weeks or months. *P. falciparum* is predominant in Kenya and is responsible for 80-90% of all severe and non-severe cases of clinical malaria (though *P. vivax*, *P. ovale* and *P. malariae* also exist in the country) [3] and is the usual cause of recrudescent infections. *P. malariae* can maintain many years of sub-clinical low-level parasitemia [3, 4]. *P.vivax* and *P.ovale* have hypnozoite forms, thus the usual causes of relapse [1]. Re-infection is considered when peripheral parasitemia causes clinical disease in *P. falciparum* malaria, usually more than 4 weeks after a successful treatment, due to new infection [1, 2]. Primaquine is recommended for radical elimination of hypnozoite stages thus preventing relapse of malaria (including in cases of suspected mixed infections with *P. falciparum* and *P.vivax*); killing gametocytes of *P. falciparum*, and eliminating developing parasites of all species in the liver[5]. Our patient most likely had recrudescent *P. falciparum* malaria due to either possible emerging resistance of *P. falciparum* to artemisinin-based therapy; or mixed infection with the hypnozoite-forming *P. ovale* or *P. vivax[3]*.

Unfortunately, we were unable to do accurate speciation of the parasites due to paucity of resources. The patient was initially re-treated with similar artemisinin-based combination therapies on repeat presentations due to availability, cost-effectiveness, and the efficacy of such re-treatments compared with alternative artemisinin combination therapy [6]. However, she did not have sustained clinical and parasitological response in subsequent reviews. Giving her primaquine resulted in both clinical and parasitological remission, which has been sustained to date. Primaquine is an effective but underutilized drug which should be considered for such cases[5]. The main caution in its usage is the increased risk of hemolysis in patients with Glucose 6-Phosphate Dehydrogenase (G6PD) deficiency[5]; which is extremely rare in Kenya.

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Author Contributions

Vonwicks Czelestakov Onyango: Conception, Design, Supervision, Materials, Data Collection and/or Processing, Analysis and/or Interpretation, Literature Review, Writing and Critical Review.

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Conflict of Interest Statement

None

Patient Consent Statement

Informed written consent was obtained from the patient for this case. No identifiable patient information is presented or used throughout this presentation.

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None

Informed Consent

Written informed consent was obtained from the patient to publish this report according to the journal's patient consent policy.