

Patients with *P. Falciparum* Shizontemia Need Close Monitoring

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Shizonts of *P. falciparum* malaria have knobs that can cytoadhere to vascular endothelium. The other human malaria species have no cytoadherence. In patients with severe falciparum malaria, parasitized red blood cells sequestering in microvasculature cause vital organ hypoxia and dysfunction. In microcirculation, rupturing shizonts release up to 32 merozoites causing an exponential rise in parasitemia [1,2]. A high shizont count is likely to precede a rise in parasitemia and may be an early marker of severe malaria diseases. Cut-off for hyperparasitemia of WHO Malaria Treatment Guidelines trended to decline since 2006 (2006 Guidelines: $\geq 5\%$ parasitemia in low-transmission areas and $\geq 10\%$ in a high transmission areas vs 2010 Guidelines: $>2\%$ in low-transmission areas and $>5\%$ in a high transmission areas) [3,4]. Tangpukdee et al. [4] showed cut-off of parasitemia $\geq 0.5\%$ was associated with severe malaria in Thailand where was a low transmission area [5].

Predominance of mature parasites forms in peripheral blood smear also reflect a greater sequestered parasite biomass and more severe disease and more fatal outcome [6]. In patients with uncomplicated falciparum malaria, presence of schizontemia showed potential risk to further deterioration to severe malaria [7]. Recent study in Thailand showed schizontemia was found in 39.6% of patients with severe falciparum malaria and it was significantly correlated with parasite density, impaired consciousness, pulmonary edema, hypoglycemia, and hemoglobinuria [8]. Although schizontemia was more frequently seen in patients with high parasitemia, the predictive power showed to be independent of parasitemia; and schizontemia has also high specificity for exclusion of severe disease [5,9].

In areas with low malaria transmission where immunity is poor across all age groups, even a low shizont count is an indicator for close patient observation [1]. Beside absolute parasite density, presence of shizonts on blood smears is a good indicator of more severe infection [9]. Although schizontemia may be associated with poor outcome in falciparum malaria, presence of schizontemia was not currently included in WHO definitions for severe falciparum malaria but was

one of poor prognostic indicators of severe disease [10]. Schizontemia may be another laboratory indicator for early detection of other severe malaria diseases, thus close clinical and laboratory monitoring of the falciparum malaria patients with schizontemia is needed. In the settings particularly in low transmission areas where close monitoring is not available, presence of schizontemia in falciparum malaria patients may be relevant to guide selection of parenteral antimalarial treatment.

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References

1. WHO (2012) Management of severe malaria: a practical handbook (3rd edn) 41-42.
2. WHO (2010) Guidelines for the treatment of malaria. Second edition.
3. WHO (2006) Guidelines for the treatment of malaria.
4. Tangpukdee N, Krudsood S, Kano S, Wilairatana P (2012) Falciparum malaria parasitemia index for predicting severe malaria. *Int J Lab Hematol* 34: 320-327.
5. van Wolfswinkel ME, de Mendonca Melo M, Vliegenthart-Jongbloed K, Koelewijn R, van Hellemond JJ, et al. (2012) The prognostic value of schizontemia in imported *Plasmodium falciparum* malaria. *Malaria J* 11: 301.
6. Tangpukdee N, Krudsood S, Wilairatana P (2013) Schizontemia as an indicator of severe malaria. *Southeast Asian J Trop Med Public Health* 44: 740-743.
7. Lwin KM, Ashley EA, Proux S, Silamut K, Nosten F, et al. (2008) Clinically uncomplicated *Plasmodium falciparum* malaria with high schizontemia: a case report. *Malaria J* 7: 57.
8. Tangpukdee N, Krudsood S, Thanachartwet V, Duagdee C, Paksala S, et al. (2007) Predictive score of uncomplicated falciparum malaria patients turning to severe malaria. *Korean J Parasitol* 45: 273-282.
9. Silamut K, White NJ (1993) Relation of the stage of parasite development in the peripheral blood to prognosis in severe falciparum malaria. *Trans R Soc Trop Med Hyg* 87: 436-443.
10. Lew VL (2005) Malaria: endless fascination with merozoite release. *Curr Biol* 15: 760-761.

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