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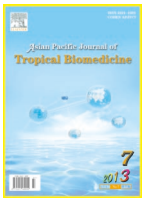

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Definition of hyperparasitemia in severe falciparum malaria should be updated

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Dear editor,

Hyperparasitemia is one criterion of severe falciparum malaria by World Health Organization (WHO) for more than two decades[1]. Although there is a correlation between density of parasittemia and severity of malaria, some individuals with high parasite counts may not be severely ill, whereas others with low parasitemia may have ultimately fatal infections. Hyperparasitemia (more than 5% infected erythrocytes or more than 250 000 parasites/μL) indicated poor prognosis in cerebral malaria in Thai adults[2]. In areas where malaria is of low edemicity, patients with *Plasmodium falciparum* parasitemia above 100000/μL (above 250 parasites per thick blood film or 2% infected erythrocytes) warrant careful observation, especially when hematocrit is low[3]. The overall mortality of uncomplicated falciparum malaria was 0.1%, but in patients with parasitemia of >4% it was 3%, however, in areas of moderate or high transmission, much higher parasitemia is often well tolerated[4]; thus, in 2006, WHO had not enough evidence to provide a firm recommendation on the definition of hyperparasitema, although >5% parasitemia in a low-transmission setting and >10% in a higher transmission setting are commonly used. In 2010, WHO defined hyperparasitemia as >2%/100 000/μL in low intensity transmission areas or >5% or 250000/μL in areas of high stable malaria transmission intensity[5]. In 2012, the latest study in Thailand (where is low-transmission area) showed that falciparum parasitemia density of 0.5% was considered a cutoff point for discrimination between severity levels of falciparum malaria patients[6].

Therefore, in the past two decades, definition of hyperparasitemia contributing to severe malaria showed a lower trend of cutoff points, possibly patients came to seek treatment more early than two decades and possibly widespread use of potent antimalarial drugs today (*e.g.*, artemisinin combination therapy or ACT) which were better than the old drug quinine. Artemisin derivatives clear parasites more rapidly than quinine. They also kill ring to mature stages of parasites whereas quinine has effect on only mature parasite stages. ACT may cause less parasite clearance time after treatment than quinine. However, this may cause less asymptomatic parasitemia and less or absence partial malaria immunity in population in malaria endemic areas. When patients have malaria infection, even low density of parasite count, the patients may have severe malaria and the low parasite density of these patients is enough to be considered as hyperparasitemia for them. Use of buffy coat thick films in detecting malaria parasites in severe patients with negative conventional thick films may help diagnosis of malaria[7].

In conclusion, trend of hyperparasitemia of falciparum malaria has declined continuously. National health authorities in each countries where malaria is endemic should be regularly monitored the percentage of parasitemia or the number or parasite count causing severe malaria of the patients in the countries. Therefore, definition of hyperparasitemia may not be similar in different areas and in different time in the future.

Conflict of interest statement

We declare that we have no conflict of interest.

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