

A novel histological grading scheme for placental malaria applied in areas of high and low malaria transmission

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Abstract

BACKGROUND—*Plasmodium falciparum*-infected erythrocytes sequester in the placenta and elicit an inflammatory response that is harmful to both fetus and mother. Histologic measurements during placental malaria (PM) might provide surrogate endpoints for interventional trials, but existing histologic schemes capture limited complexity and are not consistently used among study sites.

METHODS—Using frozen section histology in Tanzania (high transmission area), we establish a novel grading scheme to separately quantify inflammation and pigment deposition during PM (n=102). To generalize this method, formalin-fixed paraffin-embedded placental samples from Karen women in Thailand (low transmission area) were selected from among those with documented antenatal parasitemia near term (n=18).

RESULTS—In the Tanzanian cohort, the inflammation and pigment deposition scores were independently associated with birth weight, and the inflammation score was associated with chemokine levels. In the smaller cohort from Thailand, both inflammation and pigment scores were associated with birth weight, and the pigment score had an inverse trend with the number of antenatal clinic visits.

CONCLUSIONS—This semiquantitative pathological grading scheme is simple to implement yet captures information that is associated with outcomes in Asia and Africa, and therefore should facilitate the comparison and standardization of results among clinical trials across areas of differing endemicity.