Red cell morphology and malaria anaemia in children with Southeast- Asian ovalocytosis band 3 in Papua New Guinea

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Abstract

Southeast-Asian ovalocytosis (SAO) was diagnosed in children from Madang, Papua New Guinea, by detection of the SAO band 3 gene variant using the polymerase chain reaction. SAO band 3 was present in 16/241 (6.6%) children living in the community and 32/389 (8.2%) children with acute Plasmodium falciparum malaria (P=0.42). SAO band 3 was detected in 8.2% (23/281) of alpha+-thalassaemia homozygotes, 9.4% (20/214) of heterozygotes and 2.4% (2/85) of children with a normal alpha-globin genotype (P=0.12). The most consistent feature of SAO band 3 on microscopy of thin blood films was red cells with two or more linear or irregularly-shaped pale regions. In children living in the community, these were present in 15 with SAO band 3 (sensitivity 93.8%) and only two normals (specificity 99.1%). The presence of > or = 20% ovalocytosis was a poorer indicator of SAO band 3 (sensitivity 68.8% and specificity 100%). Haematological data were similar in SAO band 3 and normal children. However, in children with acute malaria, haemoglobin levels and red cell counts were significantly lower in SAO band 3 than normal children. The degree of ovalocytosis was lower in children with SAO band 3 during acute malaria, suggesting that a selective loss of ovalocytes may contribute to malaria anaemia in Southeast-Asian ovalocytosis.