The correlation between microscopical examination and erythrocyte band 3 (AE1) gene deletion in South-east Asian ovalocytosis

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Abstract

South-east Asian ovalocytosis status was determined by microscopical examination of peripheral blood samples collected from 137 individuals in Papua New Guinea. The examination was performed separately by 2 microscopists, one of whom was very experienced in examining peripheral blood films for the diagnosis of south-east Asian ovalycytosis and the other was recently trained. The samples were also analysed by polymerase chain reaction (PCR) to determine ovalocytosis status by demonstrating a 27 base pair deletion in erythrocyte band 3 protein of the affected individuals. The microscopists were unaware of each other's results and of those obtained by PCR. Generally, there was very good agreement between the results obtained by both microscopists and the PCR. Although there was considerable inter-observer variation in the final ovalocyte count between the 2 microscopists, this did not affect their ability to discriminate between ovalocytic and normocytic individuals. Taking the PCR results as the standard, for the first, more experienced observer, the most efficient ovalocyte count cut-off point was around 50%. At this ovalocyte count the sensitivity and specificity of microscopical examination were 93.6% and 92.2%, and the positive and negative predictive values 86.3% and 96.5%, respectively. The second microscopist generally underscored the ovalocyte counts and his most efficient cut-off point was 20%, with sensitivity and specificity of 85.1% and 93.3% and positive and negative predictive values of 87.0% and 92.3%, respectively.