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Effective and cheap removal of leukocytes and platelets from plasmodium vivax infected blood

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Abstract

Background. Investigations of Plasmodium vivax are restricted to samples collected from infected persons or primates, because this parasite cannot be maintained in in vitro cultures. Contamination of P. vivax isolates with host leukocytes and platelets is detrimental to a range of ex vivo and molecular investigations. Easy-to-produce CF11 cellulose filters have recently provided us with an inexpensive method for the removal of leukocytes and platelets. This contrasted with previous reports of unacceptably high levels of infected red blood cell (IRBC) retention by CF11. The aims of this study were to compare the ability of CF11 cellulose filters and the commercial filter Plasmodipur at removing leukocyte and platelet, and to investigate the retention of P. vivax IRBCs by CF11 cellulose filtration. Methods and Results. Side-by-side comparison of six leukocyte removal methods using blood samples from five healthy donor showed that CF11 filtration reduced the mean initial leukocyte counts from 9.4 × 10 3per µl [95%CI 5.213.5] to 0.01 × 10 3[95%CI 0.010.03]. The CF11 was particularly effective at removing neutrophils. CF11 treatment also reduced initial platelet counts from 211.6 × 10 3per µl[95%CI 107.5315.7] to 0.8 × 10 3per µl [95%CI -0.72.2]. Analysis of 30 P. vivax blood samples before and after CF11 filtration showed only a minor loss in parasitaemia (≤7.1% of initial counts). Stage specific retention of P. vivax IRBCs was not observed. Conclusion. CF11 filtration is the most cost and time efficient method for the production of leukocyte- and platelet-free P. vivax-infected erythrocytes from field isolates. © 2009 Sriprawat et al.; licensee BioMed Central Ltd.

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