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RAPID IMPLEMENTATION OF PHOTOCHEMICAL PATHOGEN INACTIVATION (INTERCEPT) FOR PREPARATION OF PLATELET COMPONENTS DURING AN EPIDEMIC OF CHIKUNGUNYA VIRUS

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Background: As of January 2006 an epidemic of Chikungunya virus infection has occurred in the overseas department of Ile de La Réunion, France. More than 25% of the inhabitants were infected, resulting in a temporary suspension of blood donation to prevent possible transfusion-transmission of this highly prevalent RNA arbovirus. Chikungunya virus is associated with platelets and many infected patients develop thrombocytopenia (J. Infec Dis 1970; 122:523). Prior studies have shown that photochemical treatment (150 uM amotosalen and 3 J/cm² UVA light) of washed platelet suspensions contaminated with Chikungunya virus resulted in the inactivation of > 5.25 logs of virus. As a temporary measure, blood components for Ile de La Réunion were supplied from metropolitan France.

Aims: In order to improve and sustain the availability of platelet components, which have a short storage-life, a photochemical pathogen inactivation process for platelets (INTERCEPT™ Blood System, Cerus Corporation, Concord, CA) was implemented into routine practice.

Methods: Platelet components were collected from donors using the MCS+ system (Haemonetics, Braintree, MA) equipped with CSDP software for preparation of platelets in reduced plasma volume, or in 100% plasma followed by use of a preparation set (Vox Sang 2006; 90:128) to reduce the plasma proportion by centrifugation. For both methods, platelets were suspended in approximately 40% donor plasma and 60% platelet additive solution (Intersol™, Baxter, La Châtre, France). Platelet components for transfusion were prepared with photochemical pathogen inactivation using amotosalen HCl (150 uM) and UVA light (3 J/cm² treatment) and stored for up to 5 days prior to transfusion. Following process validation studies, routine production was introduced 3 weeks later.

Results: Thus far, 30 components have been produced using the preparation set and 39 components with the CSDP software. During process validation, the average content of components produced with the preparation sets was $3.59 \times 10^{11} \pm 0.98$ platelets and with the CSDP method the average content was $3.97 \times 10^{11} \pm 0.52$ platelets. In routine practice, while the results obtained with the preparation sets have remained constant, the average content of components produced with the CSDP method improved from 3.62×10^{11} platelets during the first week to 4.18×10^{11} platelets during the second week of routine production. No adverse reactions have been reported following the transfusion of these components.

Conclusion: Photochemical treatment with amotosalen and UVA light inactivates high titers of Chikungunya virus. The INTERCEPT™ process can be rapidly implemented for routine processing of platelet components. These results show the rapid improvement in the quality of platelet collections and preparation after experience with implementation of INTERCEPT™.