ZIKA VIRUS AND BLOOD TRANSFUSION

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Prior to the Zika virus (ZIKV) outbreak in French Polynesia (FP) (2013-2014), arbovirus transmission through blood transfusion has been reported for West Nile, dengue, Ross River and yellow fever vaccine viruses (1).

The potential for ZIKV transfusion-transmitted infections (TTIs) was demonstrated in FP with the detection of ZIKV RNA in 2.8% of asymptomatic blood donors (2). This potential was demonstrated in Brazil with the description of post transfusion ZIKV infections after transfusion of ZIKV contaminated platelet components (3). As ZIKV is a new challenge for blood transfusion (4), recommendations to prevent ZIKV TTIs have been issued by the World Health Organization, the Food and Drug Administration (FDA), the Association of American Blood Banks (1).

In FP, mitigation strategies to prevent ZIKV TTIs based on pre/post-donation donor screening, interview/symptom reporting, and product quarantine/discarding were not sensitive enough to prevent the transmission of ZIKV RNA positive blood products because most of the infections are asymptomatic. According to our experience, the most effective measures to prevent ZIKV TTIs were the implementation of nucleic acid testing of blood donations and pathogen inactivation of blood products (1).

Nucleic acid testing is a very sensitive technology but it is not a proactive strategy. Before its implementation in FP, 30 blood products have been transfused to 26 recipients (1). Nucleic acid testing requires a molecular platform and licensed assays that most of the times are not available for emerging pathogens. The FDA authorized emergency use of experimental nucleic acid tests to screen blood donation for ZIKV (5).

Pathogen inactivation is a proactive strategy designed to reduce or abolish infectivity of bacteria, viruses, parasites, and potentially unknown pathogens in blood products (6). PI systems are only approved for plasma and platelets treatment even though promising results have been obtained with photochemical processes for the treatment of whole blood and red blood cells (7). Pathogen inactivation of ZIKV in plasma has been demonstrated (8).

The main limitation of both nucleic acid testing and pathogen inactivation is the costs for low resources countries.

Development of multiples nucleic acid testing assays to screen blood donations and licensed pathogen-inactivation systems suitable for whole blood and red blood cells are urgently needed.