

Reversal of Antithrombotic Therapy Prior to Heart Transplant in Pediatric Patients

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Background

Every year, 350-400 children receive a heart transplant in the US. Unfortunately, ~70 others die awaiting heart transplant. Although still unacceptably high, waitlist deaths have improved in recent years with use of ventricular assist devices (VAD) to bridge to transplant. VADs, however, require anticoagulation to prevent clotting. The University of Iowa (UI) pediatric heart transplant program has primarily used warfarin as the maintenance anticoagulant when VADs are required. This must quickly be reversed before transplant. There is controversy on the ideal reversal strategy prior to surgery. Recently, due to a UI Blood Bank mandate, our program shifted from fresh frozen plasma (FFP) to vitamin K for warfarin reversal.

While many studies have assessed outcomes in pediatric VADs, none have established a standard warfarin reversal protocol.

Methods

This retrospective chart review of UI Children's medical records found 6 patients who received FFP and 5 who received vitamin K for reversal. Data collected includes blood products used to reverse warfarin prior to transplant, during the operation, and 48 hours post-operatively. Additionally, overall patient outcomes, operating room time, and post-surgical complications were recorded.

Results

The vitamin K group received the same amount of packed red blood cells, platelets, and protamine, but received more cryoprecipitate, Factor VII, and vitamin K during surgery than the FFP group. The two groups also differed in how they affected the INR pre-operatively, with FFP providing a more consistent response. Additionally, pre-operative FFP on average brought the INR down by 1.38, whereas the vitamin K group average drop was just 0.72.

Discussion

Neither FFP nor vitamin K alone is clearly superior for quick reversal of warfarin prior to surgery, although our numbers of VADs may be insufficient to see that trend. The vitamin K group generally used more products during surgery, but fewer products post-operatively. Our team believes a combination of a small amount of FFP with vitamin K prior to surgery would allow the optimal reversal situation: to boost synthesis of clotting factors with vitamin K and more immediate reversal with FFP just prior to skin incision.