Online Proceedings

POSTER SESSION 4

Balcony, Easel 122

4:00 PM to 6:00 PM

Determining Baseline Partial Thromboplastin Time Using Protamine and Corrected Heparin Activity Curve

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Mentor: Wayne Chandler, Laboratories

Concomitant conditions in pediatric patients have caused discordances between the activated partial thromboplastin time (APTT) and the anti-Xa assay, complicating the management of heparin therapy. This raises concerns in administering heparin for the desired therapeutic effect. We tested the protamine assay to determine baseline protamine partial thromboplastin time (PrPTT) and the new plasma hemoglobin and total bilirubin assays to correct the false measurements. In doing this, we found a notable decrease in discordance in APTT and anti-Xa values. These findings are potentially significant in that it could alter therapeutic decisions in the patient.

POSTER SESSION 4

Balcony, Easel 121

4:00 PM to 6:00 PM

Management of Anticoagulation and Hemostasis for Pediatric Extracorporeal Membrane Oxygenation: A Call for Change in the Current Preferred Method of Testing

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Extracorporeal Membrane Oxygenation (ECMO) is a complex technology used to support patients with severe respiratory and/or cardiac failures. Because blood contacts with foreign non-biologic surfaces that result in thrombus formation within the extracorporeal circuit, the management of patients placed on ECMO requires monitoring anticoagulation – heparin (UFH), which is used to balance between clot formation and bleeding difficulties. Though Activated Clotting Time (ACT), which is a test used to monitor high doses of unfractionated heparin therapy, is the preferred method of monitoring, it is imprecise and insensitive to lower dose (0.2-0.4 aXa U/mL) of heparin. The goal of this study was to evaluate the effects of other factors than heparin – hematocrit, coagulation factor levels, platelet count, contact activators, and antithrombin – on ACT and raise awareness of how the use of ACT in monitoring low dose UFH under ECMO support was controversial. Results of experiments showed when only antithrombin levels or heparin concentration increased, ACT values were prolonged but only for heparin concentration > 0.5 U/mL. Decrease in single factor change of coagulation factors, Factor XII, and platelet count led to rise in ACT results. However, no correlation was observed between ACT values and hematocrit changes ($r^2 = 0.03$). When different levels of all factors of interest and heparin were mixed together randomly, heparin concentration and ACT values didn't show any correlation ($r^2 = 0.00$), suggesting the interference of other factors on its results. However, aXa heparin activity assay demonstrated a strong correlation ($r^2 = 0.99$) with heparin concentration even in multiple random factors change. Thus, further research should be performed to evaluate impacts of other factors in clinical relevance and aid in a change to the preferred method of monitoring low dose UFH under ECMO support.