

Title: Anticoagulation use and Thrombosis rate in children with aortopulmonary shunts

Authors: O Rodriguez <sup>1</sup>, JM Staber <sup>2</sup>

<sup>1</sup>University of Iowa Children's Hospital, Department of Pediatrics, Division of Pediatric Cardiology, 200 Hawkins Drive, Iowa City, IA 52242, United States

<sup>2</sup>University of Iowa Children's Hospital, Department of Pediatrics, Division of Pediatric Hematology-Oncology, 200 Hawkins Drive, Iowa City, IA 52242, United States

#### Introduction:

Children born with congenital heart disease may suffer from complications which lead to an increase in healthcare costs and poor outcomes. Thrombosis formation is a common complication in patients with an aortopulmonary (AP) shunt including BT shunt, Sano shunt, or central shunt. Currently no consensus exists regarding the appropriate pharmacological management to prevent thrombus formation in children with AP shunts. Due to this gap in knowledge, we performed a retrospective analysis, to address the question if aspirin is non-inferior to low-molecular-weight heparin (LMWH) in preventing thrombus formation in patients with an aortopulmonary shunt.

#### Methods:

In this study, we included pediatric patients who underwent an AP shunt intervention at UI Children's Hospital from January 1st, 2013 to March 31<sup>st</sup>, 2015. The primary endpoint of our study is thrombus formation with a secondary endpoint of death. We compared pharmacological management of those with thrombus formation versus those without thrombosis. A total of 21 patients were included in a preliminary analysis.

#### Results

Demographically the rates of males and females were similar with males representing 52% and females 48% of the patients. Our distribution on types of shunts was equal with BT and central representing each 33% of the group and Sano representing 29%. There was one child who received a Sano shunt which was taken down due to shunt obstruction and converted to a BT shunt. Distribution of pharmacological management for prevention of thrombus formation is 62% of the patients were taking aspirin, 19% of the patients were taking LMWH, and 19% of the patients were taking both aspirin and LMWH. Thrombus occurred in 33% of the patients. Our data demonstrates that 31% of those on aspirin had thrombosis formation; compared to 50% of those on LMWH alone had thrombosis. In the group of patients who were on both aspirin and LMWH, 20% of those had thrombosis formation. Diagnosis of thrombosis was predominately made by sonographic confirmation.

#### Conclusions

Aspirin is the mainstay for thrombosis prevention in children with AP shunts, but new combinations of antiplatelet and antithrombotic medications are being developed in order to further reduce the rate of thrombosis in this population. We conclude that to date a favorable pharmacological treatment for thrombus prevention cannot yet be determined. However, with further studies and a multi-institutional collaboration, we will be able to determine the most appropriate course of therapy.