Managing antithrombotic (anticoagulant and antiplatelet) therapy in outpatient children is associated with a number of challenges. The drugs available for children are off label and limited in number. Drugs most commonly used include warfarin (Coumadin®) an oral anticoagulant, and enoxaparin (Louvenox®) an injectable low molecular weight heparin (LMWH). There are no pediatric formulations for most antithrombotic agents limiting dose measurement and titration. The new direct oral anticoagulants are currently being studied in children and not yet recommended for use outside of formal studies.

Warfarin, a Vitamin K antagonist, is a challenging drug to use in all patient populations, with additional challenges in children. Normal growth and development of infants and children entails alteration in diet (varying amounts of Vitamin K in formulas, no Vitamin K in breast milk, inconsistent food volumes ingested), and frequent viral illnesses common to childhood further complicate the stability of anticoagulation. Additionally, frequent blood monitoring is required to monitor the drug effect with INR. Children are often needle phobic with poor venous access. Solutions include capillary blood samples for INR testing performed using a point of care INR meter such as the CoaguChek®. In children who are persistently unstable Vitamin K supplementation, although not useful in adults, may improve stability of the INR in infants and children.

Because of the difficulties associated with warfarin particularly in infants, LMWHs are often used. Enoxaparin, a LMWH, necessitates needle pokes (subcutaneous injections) once or twice a day, venipuncture blood levels to facilitate dose adjustments that are required with weight-based dosing, and frequent dose errors due to the infinitesimally small volume of medication required for small pediatric doses. The use of insulin syringes to measure enoxaparin doses minimizes dosing errors with enoxaparin as 1 mg of enoxaparin is equivalent to 1 measure on an insulin syringe. In addition, the small need gauge and length reduces bruising, and tissue trauma, associated with heparin injections.

Duration of anticoagulation for children is extrapolated from adult studies despite developmental hemostasis resulting in decreased levels of thrombin in pediatric thrombosis. Studies are required to determine clot lysis and / or stabilization in children to define the duration of anticoagulant therapy necessary.

Health related quality of life is negatively impacted by anticoagulant therapy. The negative impact includes restriction on activities that may result in delayed normal growth and development due to risk for bleeding, and cost of the medication and monitoring. Adolescents and young adults (AYAs) describe the toil of daily medication regimes. As a result, adherence to medication management is affected, thereby reducing the safety and efficacy of these medications. For AYAs, the brain is still in process of development with the frontal lobe and executive functioning being the last area to fully develop. Adherence to medical therapy poses a unique challenge in this age group as a result of growing independence combined with underdeveloped executive functioning. It is necessary to assess the impact of antithrombotic agents on HRQOL and work with children and AYAs to find solutions to minimize the impact. Developing a formal transition assessment process and policy with an aim to engaging AYAs in managing their health decisions and management is necessary.
When managing antithrombotic therapy in outpatient infants, children and AYAs it is necessary to critically evaluate practice considering the level of evidence and impact on HRQOL. Minimizing the negative influence of antithrombotic therapy on HRQOL, and collaborating with patients and their families to find management strategies that are consistent with their lifestyle, may improve adherence resulting in improved safety and efficacy of antithrombotic therapy.

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