NAME OF PROJECT
Anticoagulation for Patients with Mechanical Heart Valves during Pregnancy: A survey

Subcommittee: Women’s Health Issues in Thrombosis and Hemostasis

Person responsible (Chair / Principal Investigator): Maha Othman/Nadine Shehata /Isabelle Malhame

Collaborators: Dr. Isabelle Malhalme, Brown’s University, Candice Silversides, Division of Cardiology, Department of Medicine University of Toronto, Dr. Rohan D’Souza, Maternal Fetal Medicine Physician, Department of Obstetrics and Gynecology, University of Toronto, Dr. Rachel Wald, Division of Cardiology, Department of Medicine, University of Toronto, Dr. Mathew Sermer, Maternal Fetal Medicine Physician, Department of Obstetrics and Gynecology, University of Toronto, Special Pregnancy Program, Mount Sinai Hospital

Description Abstract

Patients with mechanical heart valves (MHVs) require life-long anticoagulation to prevent thromboembolic complications (TEs). The risk of TEs is increased during pregnancy and women with MHVs have only a 58% chance of experiencing an uncomplicated pregnancy with a live birth. Non-pregnant women with MHVs are treated with vitamin-K antagonists (VKAs) e.g. warfarin, but as VKAs traverse the placenta and are teratogenic, alternative anticoagulation regimens have been used in pregnancy with the aim of reducing fetal risks. There is a need to optimize anticoagulant therapy antepartum in patients with mechanical heart valves as these women are at increased risk of thrombosis and bleeding and exposure to teratogenic drugs, the vitamin K antagonists e.g. warfarin. There are 3 options for anticoagulation during pregnancy for these women, low molecular weight heparin (LMWH) throughout pregnancy, VKAs throughout pregnancy, LMWH in the first trimester and VKAs in the second and third trimester. The risk of VKA induced embryopathy (predominantly midfacial hypoplasia and stippled epiphyses) is between 3-6% during 6-12 weeks gestation. At any time during pregnancy VKAs are associated with an increased risk of CNS abnormalities, dorsal or midline ventral dysplasia but these are rare occurrences (fetopathy). Approximately 1% of women develop thrombosis of prosthetic mechanical valves with VKAs and 3% develop thromboembolic complications.

If LMWH is substituted for VKAs between 6 to 12 weeks, as LMWH does not traverse the placenta, there is no risk of embryopathy but there remains a risk of fetopathy as VKAs would be restarted after 12 weeks gestation. The rate of thrombosis of the prosthetic mechanical valve also increases and is 5% and thromboembolic complications 6%.

If LMWH during the entire antenatal period, there is no risk of embryopathy or fetopathy but the rate for thrombosis of the mechanical valve and thromboembolic complications increases to 10% and 10% respectively.
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There are no randomized controlled trials or adequately powered prospective studies to determine the optimal anticoagulation management for these patients. Before embarking on such studies, it is important to gauge practice preferences for anticoagulation as the first step to inform a study design and engage potential investigators.

We propose constructing an electronic survey and distributing it to physicians involved in the care of these patients. This survey will help gather practice preferences for anticoagulation as the first step to inform a study design and engage potential investigators.

Design and methodology (Data expected to collect, sample size and statistical analysis):

We will be using a cross-sectional study using self-administered online (Survey Monkey™) questionnaires sent to hematologists, cardiologists and Obstetricians/Gynecologists internationally. Participants will include members identified by the investigative team from a previous systematic review of 46 studies of anticoagulation regimens in pregnant patients with mechanical heart valves. We will also approach international societies to request the survey be sent to their participants. This study will involve an electronic survey consisting of predominantly multiple choice questions. Questions aimed at assessing variation in practice will be designed based on recommendations published in the literature regarding treatment strategies. Other questions involved in the study will gather information about physician characteristics which will include hospital academic/community affiliation, specialty, years in practice, number of patients during pregnancy that are managed at the centre in one year and number of cases during pregnancy the participant is involved with in one year.

We will pilot the survey for comprehensibility, validity and time to completion. We will revise the survey based on comments received.

**Questionnaire Administration**

Once questionnaire revisions are complete, an email will be sent to all potential participants describing the study with a link to the online survey. One week after initial contact, a second email will be sent introducing the study and a link to the online survey. The online survey results will register the completed survey as a study participant number but no other identifying information will be collected unless the participant provides their contact information. The participant will be sent two additional reminder emails to complete the questionnaire to maximize response rates.

**Statistical Analysis**
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We will determine the proportion of respondents and the proportion according to specialty. Continuous variables will be described as mean (standard deviation) or medians (interquartile range) if the data were heavily skewed. Categorical variables will be described as numbers and percentages. To determine the characteristics associated with the selection of an anticoagulant, univariate analyses (Chi square or the Fisher’s exact test for categorical variables and the Student’s t-test, Wilcoxon rank-sum, or Kruskal-Wallis test for continuous variables) will be performed.

Study population (Inclusion, exclusion, eligibility) (patient population; recruitment of participating institutions/physicians and subjects; minimum number needed; expected number):

The study population are physicians who are managing these patients in any institution. These include hematologists, cardiologists and Obstetricians/Gynecologists.

Expected timeline:

- Project stage/set up
  - Launch: September 2019
  - Duration: 3 months.
  - Finalization/analysis: 2 months
  - Reporting: 2 months

Expected outcomes (ie. publications): We anticipate that in addition to using these data for a subsequent study, that the results will be publishable and able to inform physicians about current practice.

Publication type (SSC Communication, Guidance document or original article): Original article

Description of project set/up and management, needed infrastructure and resources (summary): We are kindly requesting to use the ISTH REDCap web application to develop the survey and subsequently share it on ISTH website and also send it to all members to maximize participation.

Possible references


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