

Maternal Outcomes among Rwandan Women with Rheumatic Heart Disease and Prosthetic Heart Valves

Nikki Schulick, BS^{1,2}, Emmanuel Rusingiza, MD³, Patiente Umugangwa, MD³, Ceeya Patton-Bolman, BSN⁴, Yihan Lin MD MPH²

1 University of Colorado School of Medicine, CO USA; 2 Department of Cardiothoracic Surgery, Stanford University, CA USA; 3 University of Rwanda College of Medicine and Health Sciences, Kigali Rwanda; 4 Team Heart Inc, Kigali Rwanda

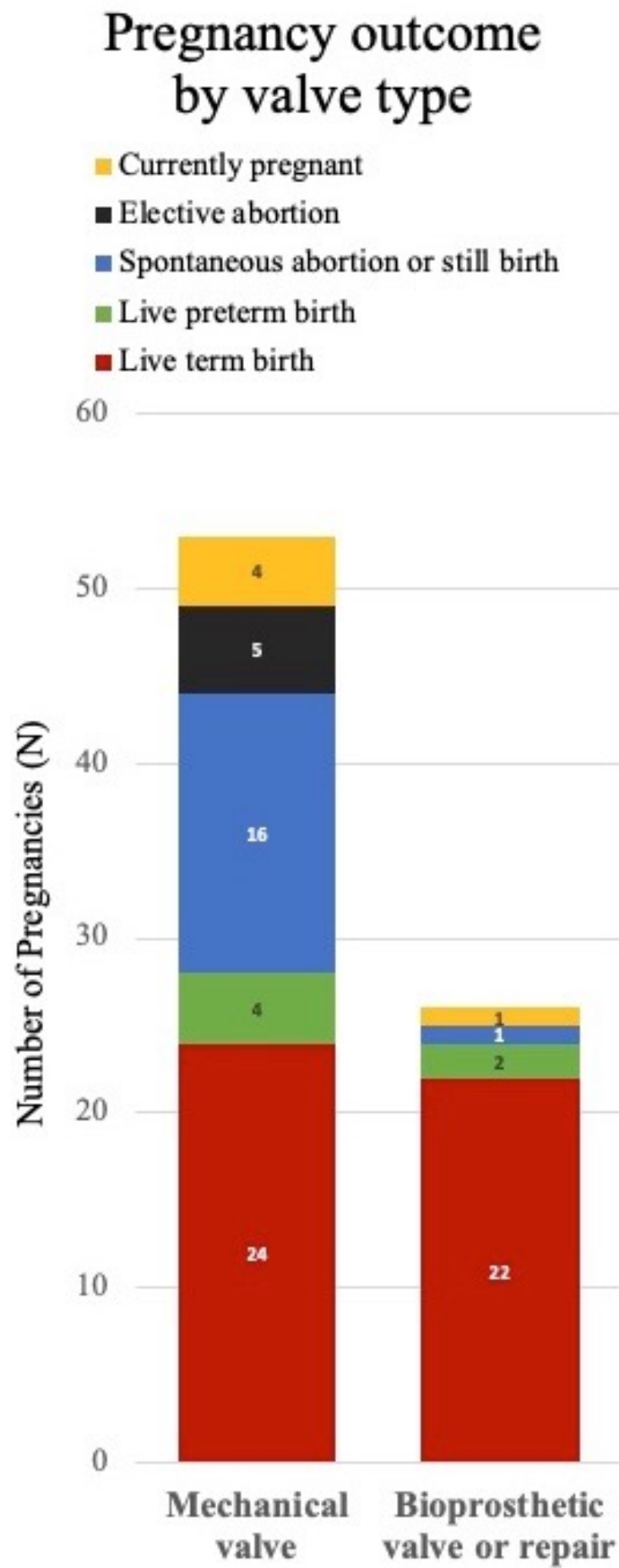
Results

Background

- Rheumatic heart disease (RHD) represents the largest burden of cardiovascular disease in low-and-middle-income countries (LMICs).
- Average age at time of diagnosis is 20-25 years old.
- Surgical intervention with a prosthetic heart valve (PHV) is often necessary.
- Hemodynamic changes during pregnancy increase the risk of adverse outcomes.
- Warfarin, which is the first line anticoagulant used for patients with mechanical valves, is teratogenic.
- ~90% data from cited studies come from pregnant patients in North America and Europe.
- Here, we present the first data on maternal outcomes among Rwandan women with PHVs

Table 1: Baseline Characteristics

Sample size, n	136
Age at time of surgery, y, mean +/- SD	25.4 +/- 10.6
Year of surgery, median [range]	2015 [2013-2018]
Number of valves operated on, n (%)	
Single valve	92 (67.7%)
Double valve	39 (28.7%)
Triple valve	2 (1.5%)
Valve operated, n (%)	
Mitral	14 (61%)
Aortic	6 (26%)
Tricuspid	3 (13%)
Type of surgery, n (%)	
At least 1 mechanical valve	111 (81.6%)
Bioprosthetic valve +/- repair	17 (12.5%)
Repair only	6 (4.4%)



Methods

- The Rwandan RHD surgical registry identified eligible participants based on the following:
 - Female sex
 - Surgery before or during childbearing age (12-51)
 - Living in Rwanda
- A mixed-method survey was administered to participants. Survey questions included information on:
 - Demographics
 - Medical and surgical history
 - Perioperative family planning counseling
 - Maternal outcomes
 - Fetal outcomes
- Responses were de-identified and exported to STATA

Sources

- Watkins DA, et al. Global, Regional, and National Burden of Rheumatic Heart Disease, 1990-2015. N Engl J Med. 2017 Aug 24;377(8).
- Antunes MJ. The Global Burden of Rheumatic Heart Disease: Population-Related Differences (It is Not All the Same!). Braz J Cardiovasc Surg. 2020 Dec 1;35(6).
- van Hagen IM, et al. ROPAC Investigators and the EURObservational Research Programme (EORP) Team. Pregnancy in Women With a Mechanical Heart Valve: Data of the European Society of Cardiology Registry of Pregnancy and Cardiac Disease (ROPAC). Circulation. 2015 Jul 14;132(2).

Acknowledgements

We'd like to acknowledge the Rwandan Biomedical Center and the Rwandan Ministry of Health for their support and collaboration. We would also like to acknowledge Team Heart for their dedication to these patients and the Stanford Maternal and Child Health Research Institute for in part funding this project.

Anticoagulation during pregnancy

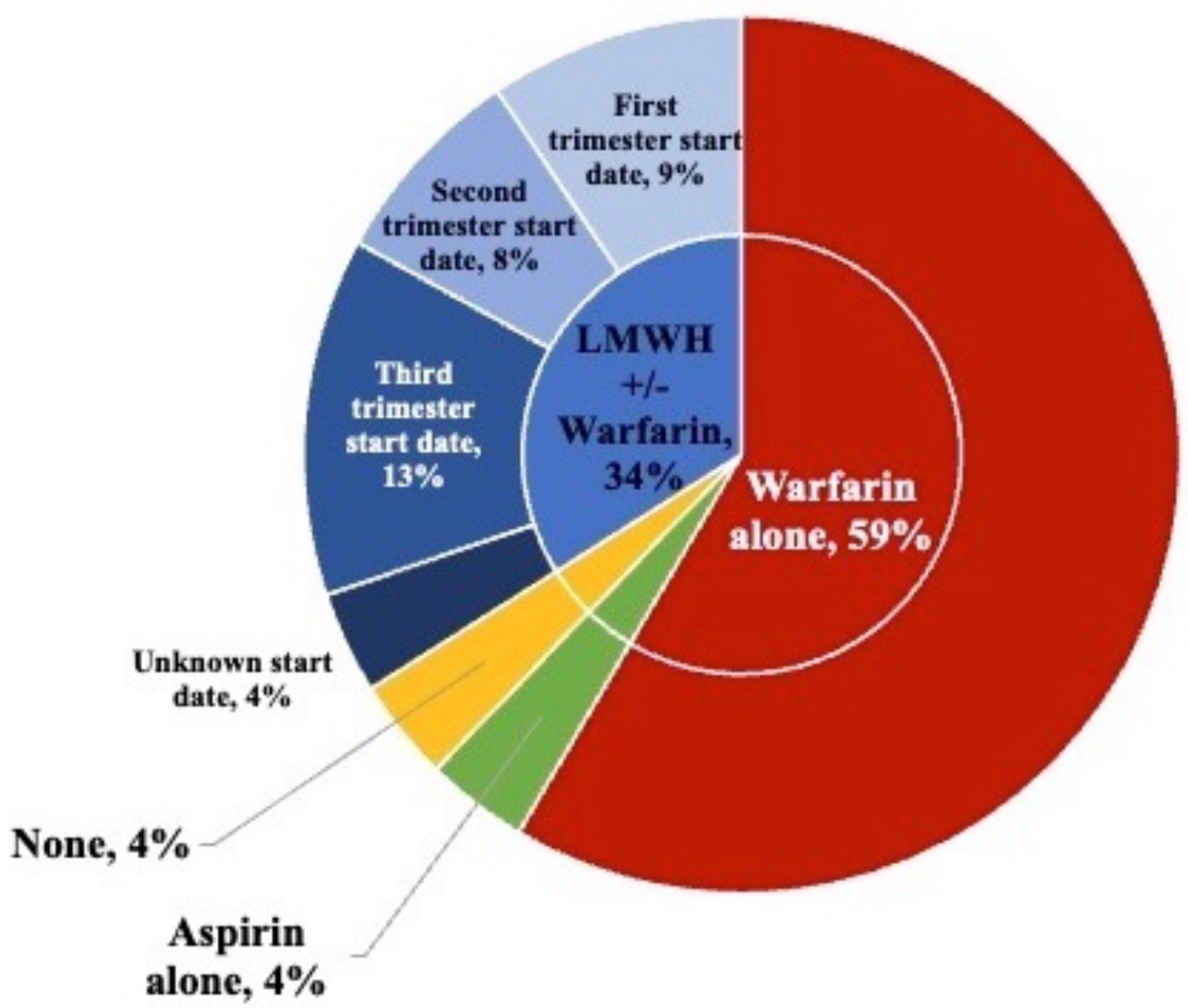


Table 2: Complications

Maternal Complications	N, (%)
Excessive bleeding	7 (9.1)
Ectopic pregnancy	1 (1.3)
INR out of therapeutic range requiring admission	3 (3.9)
Symptoms of heart failure	2 (2.6)
Fetal birth defects	
Nasal hypoplasia	1 (1.9)
Omphalocele	1 (1.9)
Cleft palate	1 (1.9)

Conclusions

- Over one third of women became pregnant after surgery.
- Half of the pregnancies were intentional.
- Women with bioprosthetic valves or repair were more likely to experience live term birth and less likely to report spontaneous miscarriage.
- Excessive bleeding was the most common complication during pregnancy.
- 2 infants were diagnosed with congenital defects associated with warfarin embryopathy
- There is a need to for evidence-based and context-specific anticoagulation practices during pregnancy.