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Title: ANTICOAGULATION MANAGEMENT OF POSTOPERATIVE RHEUMATIC HEART DISEASE PATIENTS IN RWANDA

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Background & Aims: Rheumatic heart disease (RHD) patients with mechanical heart valves or with atrial fibrillation (Afib) require long-term anticoagulation. Medical management and routine INR testing is essential to prevent adverse bleeding or clotting events. However, a study reported that in low-resource settings, nearly half of patients on anticoagulation do not receive routine INR testing. In Rwanda, nurses at District hospitals follow patients' INR values and warfarin dosages. A population-based review of anticoagulation status has not been possible until the recent creation of an RHD registry. Here, we describe follow-up protocols and present preliminary data on RHD patient anticoagulation between 2020-2023.

Methods: The RHD Registry is stored in a secure REDCap database. Patients are called on a monthly basis by our Data Management Officer and asked for their most recent INR value and current warfarin dose, issues with accessing medications, and other health concerns. Team Heart's (TH) Patient Coordinator liaises with primary providers for patients with INRs outside therapeutic range (TR). Patient responses are recorded in "Internal Follow-up" surveys in the Registry. All 154 patients with Internal Follow-up entries in 2022 were included. INR target was determined by type of surgeries and/or presence of Afib. Time in therapeutic range (TTR) was determined by the percentage of INR measurements within TR over total INR measurements. Categorical and continuous variables were compared using Pearson chi-squared test (or Fisher's exact test) and Wilcoxon rank-sum statistics respectively.

Results: Of the 154 patients, the majority were females (88 [57.1%]) and at time of surgery had a mean [IQR] age of 24 [17-31] years. Most patients had a single valve (43 [27.9%]) or double valve (43 [27.9%]) operation, of which mitral mechanical valve replacement was the most common (76 [52.1%]). On average, patients had an INR of 2.6 +/- 0.48, a warfarin dosage of 7.7 +/- 4.16 mg, and a TTR of 52.2 +/- 28.30 %. Compared with patients whose average INR values fall within TR (87 [57.1%]), subtherapeutic patients (47 [30.5%]) were on higher average warfarin (6.8 +/- 2.78 mg vs. 9.4 +/- 5.77 mg, P = 0.0019). Both subtherapeutic (8.3 +/- 4.67, P < 0.0001) and supratherapeutic (9.2 +/- 6.59, P = 0.0402) patients had fewer follow-up appointments than therapeutic patients (13.1 +/- 5.63). Subtherapeutic patients had more difficulty accessing medications than therapeutic patients (11 [23.4%] vs. 14 [16.1%], P = 0.2998). Lastly, a higher proportion of patients with lower INR target of 2.0-3.0 existed among supratherapeutic than therapeutic patients (4 [30.8%] vs. 3 [3.4%], P = 0.0050). During the follow-ups, skipped INR measurements were reported in 49 patients, 31 of which were due to INR strips running out at their hospitals. TH provided financial support for 22 of the 29 patients reporting medication access issues. Lastly, we identified four pregnant patients and nine females experiencing heavy bleeding.

Conclusions: To prevent adverse events in patients on warfarin, it is essential to monitor their INR on a routine basis. The creation of the RHD Registry has enabled better tracking of patients' anticoagulation status. Although the majority of our patients stay within TR, issues such as lack of medication access and adherence, lack of patient and clinician education may have contributed to patients whose INRs fall out of the therapeutic range. This data will empower us to bring together key stakeholders to continue improving anticoagulation tracking and management for patients within the Rwandan system.