Analyzing Atrial Fibrillation Burden in Hemodialysis Patients with Cardiac Devices

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Introduction: The development of atrial fibrillation (AF) in patients with end-stage renal disease (ESRD) on hemodialysis (HD) confers a poor prognosis, nearly tripling four-year mortality rates in this population. However, it remains unclear whether AF is an independent risk factor for mortality in ESRD or is instead a marker of cardiovascular risk. Cardiac implantable electronic devices (CIEDs) offer a unique and underutilized source of rhythm data analysis which might be used to investigate the differences in AF burden between HD patients and controls.

Methods: We identified 44 patients at a single tertiary academic center with CIEDs, 22 of which were on HD, along with 22 age- and sex-matched controls not on HD. Device interrogations from 11/13/14 – 3/15/19 were reviewed. AF burden, atrial pacing burden, average time per day spent in AF, treated AF episodes, and pace-terminated episodes were recorded.

Result: There were no differences between HD patients and controls in age, sex, antiarrhythmic regimen, or device type. However, HD patients were more likely to have obstructive sleep apnea (55% vs 9.1%, $p = 0.001$) and any cardiomyopathy (73% vs 41%, $p = 0.03$, Table 1). Overall, there was no statistical difference in AF prevalence between patients on HD (15/22, 68%) and controls (9/22, 41%, $p=0.07$). Of those with known AF, 10 HD patients and 5 control patients possessed a CIED with an atrial lead capable of rhythm analysis. There were no differences between HD patients and controls in mean AF burden (38.1% vs 39.6%, $p= 0.955$), mean atrial pacing burden (32.2% vs 31.8%, $p= 0.984$), or average time per day spent in AF (9.00 hr/d vs 12.4 hr/d, $p= 0.685$, Table 1). No patients in either group experienced pace-terminated episodes.

Conclusion: In this small retrospective study, there was no difference in AF burden between HD patients and controls with CIEDs. This data would suggest AF itself may not directly contribute to mortality in HD patients. Larger studies utilizing the capabilities of CIEDs are needed to more clearly define arrhythmia burden in this high-risk population.