A Pilot Study Using an Implantable Device to Characterize Cardiac Arrhythmias in Hemodialysis Patients: Implications for Future Research

Patrick H. Pun, M.D., M.H.S.,*† Debra Schumm, R.N.,†
Gillian D. Sanders, Ph.D.,* Deborah Hickey, B.S.,‡ John P. Middleton, M.D.,†
Nancy Clapp-Channing, M.P.H.,* and Sana M. Al-Khatib, M.D., M.H.S.*‡

From the *Duke Clinical Research Institute, †Division of Nephrology, and ‡Division of Cardiology, Duke University Medical Center, Durham, NC

Ann Noninvasive Electrocardiol 2012;17(2):159

electrophysiology; cardiac arrest; sudden death; clinical; epidemiology; clinical trials

Sudden cardiac death (SCD) is the most common mode of death among hemodialysis (HD) patients, but little is known about terminal arrhythmias in HD patients. We conducted the first prospective study using an implantable cardiac monitor to capture malignant arrhythmias among hemodialysis patients. Our objective was to determine the feasibility of a larger study designed to identify mechanisms of SCD in HD patients.

We screened patients from two nephrology practices without a history of cardiac arrhythmias or pre-existing rhythm management devices. Consenting patients underwent implantation of a continuous cardiac monitor and were followed for 6 months. In total, 1093 patients were screened. 722 (66%) patients were excluded due to pre-existing arrhythmias or cardiac device or comorbid conditions which would increase infection risk or otherwise complicate the procedure. Of the

remaining patients, 363 (98%) declined participation or could not participate. Eight patients underwent implantation of the monitor. There were no significant arrhythmias or device-related adverse events.

This is the first study of an implantable cardiac monitor in HD patients. Despite minimally invasive device implantation, a strong collaboration between cardiology and nephrology, and a large population of available study subjects, we were able to enroll only eight patients. Our experience suggests that design of future studies of cardiac arrhythmias in HD patients should take into account the high burden of comorbidities and invasive procedures borne by this patient population. Reducing the burden of patient participation using less intrusive, remotely monitored devices may aid efforts to characterize arrhythmias in this challenging patient population.

Address for correspondence: Patrick H. Pun, M.D., M.H.S., Division of Nephrology, Duke University Medical Center, P.O. Box 2747, Durham, North Carolina 27710. Fax: 919-684-4476; E-mail: patrick.pun@duke.edu