CPR for OHCA Is Rarely Successful, and What Is “Success” Anyway?

The analysis by Pun et al.\(^1\) on outcomes of patients who suffered a cardiac arrest at a dialysis unit is certain to generate attention and possibly concern among medical and lay communities. The authors’ discussion of the complex logistic, procedural, and cultural factors that may delay dialysis staff from initiating cardiopulmonary resuscitation (CPR) is insightful. Additionally, the finding that CPR is initiated at lower rates in women than in men uncovers an important disparity. However, as these nuances are explored, studies like these need to be careful about how data are presented, as the implications may have serious consequences regarding the perceived effectiveness of CPR in general.

Presenting data purely in terms of relative odds minimizes the fact that most people die after out-of-hospital cardiac arrest (OHCA).\(^2\) In absolute terms, the death rate among people who had CPR initiated by dialysis unit staff was 71% (230 out of 324), compared with 86% (64 out of 74) among those who had CPR initiated by emergency medical services, an absolute risk reduction of 15%. This makes for a much more modest headline compared with the “three-fold increase in the odds of survival” quoted in the significance statement and highlighted in the visual abstract, which obscures the high mortality regardless of who performs CPR.

Additionally, although survival to hospital discharge is considered a “success,” we question the impact on quality of life from the patient’s perspective. We have come to understand that living longer is often less important to patients with serious illness compared with how well they are living.\(^3\) Of the 104 patients who survived to discharge, 86 had a favorable neurologic status, but this is defined as mild to moderate disability. Their own perception of their quality of life is unknown. Furthermore, details about the 18 patients who survived with a presumably unfavorable neurologic status were not included in the paper, but it is highly likely that meaningful patient-reported outcomes were dire.

Although delaying death and surviving cardiac arrest will always be seductive goals, we need to prioritize future studies that identify barriers to regular reassessments of code status preferences in the hemodialysis population, as well as patient and caregiver understanding of the best, worst, and most likely outcomes of attempted resuscitation. It is our hope that this study will lead to increased focus on advanced care planning and communication about prognosis as the best means of ensuring goal-concordant and patient-centered care among patients on hemodialysis.

**DISCLOSURES**

None.

**REFERENCES**


Samantha L. Gelfand, Nwamaka D. Eneanya, Amanda K. Leonberg-Yoo, and Jeffrey S. Berns
Renal-Electrolyte and Hypertension Division, University of Pennsylvania, Philadelphia, Pennsylvania


doi: https://doi.org/10.1681/ASN.2019020149

**Authors’ Reply**

We appreciate the comments of the authors regarding the fact that sudden cardiac arrest is a highly lethal condition. Per previous reports, only half of patients who suffer a cardiac arrest in dialysis clinics survive to hospital admission and only one...
quarter survive to hospital discharge, a point that is highlighted in our significance statement and article introduction. In our study, overall survival from in-clinic cardiac arrest was very similar; 48% of patients survived to hospital admission, and 26% survived to hospital discharge. Although patients on dialysis have much higher overall mortality rates compared with the general population, we would point out that survival to hospital discharge after cardiac arrest in dialysis clinics is substantially higher than that for the out-of-hospital cardiac arrest in the general population, which was only about 10% in North Carolina during the study period.1 Additionally, recent studies in overall cardiac arrest populations show that most patients who survive to hospital discharge have good functional status and return to work.2 Nevertheless, as discussed by others previously,3,4 transparent and realistic discussions about the process of CPR, potential complications, and expected success rates should be part of routine advance care planning process for all patients on dialysis, and we agree with the authors that the confirmation of low overall survival rates and even lower rates of hospital discharge with favorable neurologic status in our study should be used by providers to counsel patients.

Our study highlighted an important and readily actionable opportunity for dialysis providers to improve patient-centered care within dialysis clinics. Because patients with do-not-resuscitate orders were excluded, resuscitation should have been attempted for all of the patients in our study, but one in five patients did not receive resuscitation from staff, an obvious area for improvement. In addition, we feel that our study findings support a potential opportunity to readily improve survival outcomes in our patient population, where there are sadly few proven therapies that significantly reduce cardiovascular mortality and fewer still that reduce sudden cardiac death. The 15% absolute increase in survival associated with staff-provided CPR is far from a modest effect on mortality outcomes; put in terms of the number needed to treat, for every seven patients who received staff-provided CPR, one additional patient survived to hospital discharge. Comparatively, the use of primary prevention, implantable cardioverter defibrillators, an evidence-based and guideline-recommended therapy to reduce sudden cardiac death mortality in high-risk patients, was only associated with a 7% absolute reduction in mortality at 5 years in the largest clinical trial among patients without advanced kidney disease,3 and recent studies suggest that efficacy may be reduced or absent among patients on dialysis.6,7 Cardiopulmonary resuscitation training is comparatively inexpensive to provide, and can be performed by trained bystanders with limited or no equipment.

Over recent years, we have made small but important gains in overall mortality among hemodialysis patients, which many have attributed to a focus on improving quality of care within dialysis clinics; unfortunately, none of these gains have been paralleled with reductions in the rate of sudden death, which has remained largely unchanged.8 As the authors state, information from our study can improve goal-concordant care by helping patients make informed decisions on advanced directives. For patients who elect to be resuscitated, we hope our study serves as a challenge to dialysis providers to improve patient-centered care and potentially influence survival outcomes by ensuring staff readiness to provide high-quality CPR.

ACKNOWLEDGMENTS

This work was supported by the National Institutes of Health under grant award 1R03DK113324 awarded to Dr. Pun.

DISCLOSURES

None.

REFERENCES


Patrick H. Pun, Matthew E. Dupre, Clark Tyson, Sana M. Al-Khatib, and Christopher B. Granger
Duke Clinical Research Institute, Duke University School of Medicine, Durham, North Carolina

JASN 30: 1137–1138, 2019. doi: https://doi.org/10.1681/ASN.2019040353