

Circumstances of Death among Undocumented Immigrants Who Rely on Emergency-Only Hemodialysis

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Many undocumented immigrants in the United States with ESKD have limited access to standard hemodialysis. The availability of standard hemodialysis depends on their state of residence's interpretation of the Emergency Medical Treatment and Active Labor Act, leaving many patients reliant on emergency-only hemodialysis (EOHD) (1). To qualify for EOHD, patients must be critically ill from ESKD complications (*i.e.*, hyperkalemia, uremia, volume overload, and/or metabolic acidosis) (1). It is not uncommon for patients on EOHD to report frequent near-death experiences because of this requirement (1,2). A retrospective cohort multisite study showed that the adjusted 5-year relative hazard of mortality among undocumented patients receiving EOHD is 14-fold that for undocumented patients receiving standard hemodialysis (2). How the requirement for these patients to become critically ill on a recurring basis shapes patterns of end-of-life care has not been described. In this study, we describe the circumstances of death at one of these sites, Denver Health (DH), where approximately 70 undocumented patients with ESKD receive an average of six dialysis sessions every month (2).

We conducted a retrospective chart review of undocumented patients with ESKD who relied on EOHD at DH and died between January 2005 and March 2017. Patients were identified *via* a comprehensive hospital registry of undocumented patients with ESKD. The complete registry includes information on when patients die or are transferred to standard hemodialysis care. Patients were eligible for this study if they were over the age of 18 years old at the time of death, lacked a social security number, relied on EOHD, and had received at least 3 months of treatment before death. Information on circumstances of death was abstracted from DH medical and administrative records. Descriptive analyses were conducted using the SAS Enterprise Guide 5.1 (SAS Institute, Inc.). The study was declared exempt by the institutional review board at the University of Colorado.

Between January 2006 and January 2017, a mean of 17 (SD=6) undocumented patients were newly diagnosed with ESKD per year. Between January 1, 2005 and March 31, 2017, there were 35 undocumented patients with ESKD who met these criteria. Mean age at death was 57 years old (SD=15), and patients had been on

hemodialysis for a median of 16.0 months at the time of death (interquartile range, 9.0–32.0 months) (Table 1). Most patients died in the hospital (54%). However, almost one third died at home (11 patients), of whom seven were on hospice or comfort care at the time of death after stopping EOHD. Reasons for discontinuation were inability to tolerate hemodialysis due to hypotension ($n=3$), malignancy ($n=2$), no vascular access to hemodialysis ($n=1$), and an explicit decision to no longer pursue EOHD ($n=1$). In 63% of patients, death was due to a sudden acute event, including cardiac arrest/arrhythmia (*i.e.*, cardiac death; $n=18$), intraparenchymal hemorrhage ($n=2$), myocardial infarction ($n=1$), and septic shock ($n=1$).

Of the patients who died in the hospital (*i.e.*, terminal hospital admission; $n=19$), mean potassium level was 6.4 mEq/L (SD=1.2). During the terminal hospital admission, 15 (79%) patients had a diagnosis of "hyperkalemia," 16 (84%) had recorded rhythm disturbances, and the admission occurred on average 6 days (SD=4) after the patient's last hemodialysis session. Fifteen (79%) of the patients with a terminal hospital admission had no documentation of code status. Of these, 13 (87%) received cardiopulmonary resuscitation, and 13 (87%) were intubated; all subsequently transitioned to comfort care during their terminal admission.

More than one-half of the patients who we studied died of a cardiac arrest/arrhythmia. Unexpected critical events are almost certainly related to the emergent presentation needed to secure treatment with hemodialysis for these patients (*e.g.*, high potassium leading to cardiac death). Our findings are consistent with our prior research exploring the palliative needs of Latinos on hemodialysis (3) and national data documenting intensive patterns of end-of-life care among Latino patients on dialysis (4). How best to foster end-of-life planning for undocumented patients with ESKD receiving EOHD exposes the fundamental contradictions inherent in current approaches to caring for these patients. Few of the patients who died in the hospital had documentation of an advance directive, and most received cardiopulmonary resuscitation and intubation during the terminal admission. At the same time, lack of access to health care means that undocumented immigrants also have limited access to hospice services (5). Hospice improves health-related quality of life and

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Table 1. Patient characteristics

Characteristics	Study Sample
Patient demographics	<i>n</i> =35
Men, <i>n</i> (%)	19 (54)
Age at death, mean±SD (range)	57±15 (27–76)
Vintage, mo, median (IQR)	16.0 (9.0–32.0)
Charlson Comorbidity Index, mean±SD	7.1±3.1
Death outcome	<i>n</i> =35
Cause of death, <i>n</i> (%)	
Cardiac arrest	18 (51)
Intraparenchymal hemorrhage	2 (6)
STEMI	1 (2)
Septic shock	1 (3)
Other chronic condition	6 (17)
Failure to thrive	6 (17)
Withdrew from hemodialysis	1 (3)
Location of death, <i>n</i> (%)	
Hospital	19 (54)
Home	11 (31)
Unknown	3 (6)
Work	1 (3)
Inpatient hospice	1 (3)
Death at home with hospice services, <i>n</i> (%)	7 (20)
Characteristics of patients with a hospital death	<i>n</i> =19
Potassium level on admission, mEq/L, mean±SD	6.4±1.2
BUN level on admission, mEq/L, mean±SD	94.3±28.9
Rhythm disturbance	16 (84)
Days between last hemodialysis session and critical event, mean±SD	6±4
Admission diagnosis of hyperkalemia	15 (79)
Admission diagnosis of volume overload	3 (16)
Code status at time of hospitalization, <i>n</i> (%)	
DNR/DNI	2 (11)
Limited code	2 (11)
No code status	15 (79)
Hospital length of stay, mean±SD	8.2±10.2

IQR, interquartile range; STEMI, segment elevation myocardial infarction; DNR/DNI, do not resuscitate/do not intubate.

reduces health care costs, which should be considered given the higher mortality as well as physical and psychosocial distress described by patients who rely on EOHD (1,2).

Limitations of our study include that our findings are from a single safety net hospital and may not be generalizable to other settings. In addition, our study relied on information documented in hospital records. We were unable to ascertain cause

of death for patients who died using the National Death Index owing to lack of Social Security numbers.

In conclusion, among 35 patients with ESKD who relied on EOHD in Denver, most patients died of a cardiac death or other acute unexpected event.

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Disclosures

None.

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