

Improvements in Clinical and Operational Outcomes for a Cohort of Patients Converted From Central Venous Catheter Access

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Introduction

- Arteriovenous fistulae (AVF) are the preferred method of vascular access over central venous catheters (CVC) for patients who require renal replacement therapy.¹
- Improvements in mortality and morbidity have been reported in end-stage renal disease (ESRD) patients transitioned off CVC usage.^{2,3}
- DaVita created the CathAway program to reduce CVC usage in hemodialysis (HD) patients.
- The program uses a team of nephrologists, surgeons, social workers and clinical care providers to assist patients transitioning from CVC to AVF.
- Given the Centers for Medicare and Medicaid Services case-mix adjusted bundled prospective payment system for outpatient dialysis, 4 potential improvements in operational and surrogate biochemical outcomes might also drive the reduction in CVC use among HD patients.
- We examined the impact of vascular access on surrogate biochemical markers and operational parameters.

Methods

- We performed an observational, retrospective study of electronic medical records from HD patients receiving their first AVF/AVG between 1/1/2009 and 3/31/2010.
- Those included in the analysis were:
- HD patients aged ≥ 18 years, continuously treated 90 days prior to and 180 days subsequent to AVF or AVG insertion.
- Patients whose CVCs were not used after 14 days subsequent to first non-catheter dialysis session.
- Those excluded from the analysis were:
- Patients aged ≤ 18 years; peritoneal or home dialysis patients.

Methods (continued)

- The study outcomes included:
- Operational and biochemical outcomes after CVC conversion.
- Change in patients' mean albumin, hemoglobin, dialysis adequacy (Kt/V), and blood flow rate.
- Change in operational dialysis parameters including heparin use, tissue plasminogen activator use, and missed treatments.
- Our analyses included:
- Descriptive analyses of demographic information.
- Three-month averages for the cohort from months
 -6 to -4 before CVC conversion were compared to months +4 to +6 after CVC conversion.
- Statistical significance was determined by T-test. The level of significance was 0.01.

Results

Demographics

	Study Population (N = 3,235)
Age in years, mean (SD)	58.88 (15.48)
% Male	51.8
Vintage in years, mean (SD)	1.43 (1.85)
Body Mass Index, mean (SD)	27.47 (7.04)
% Diabetic	46.0
Race, % African American Hispanic Asian, Pacific Islander Native American Unknown	36.9 21.5 4.1 1.0 0.2

Results (continued)

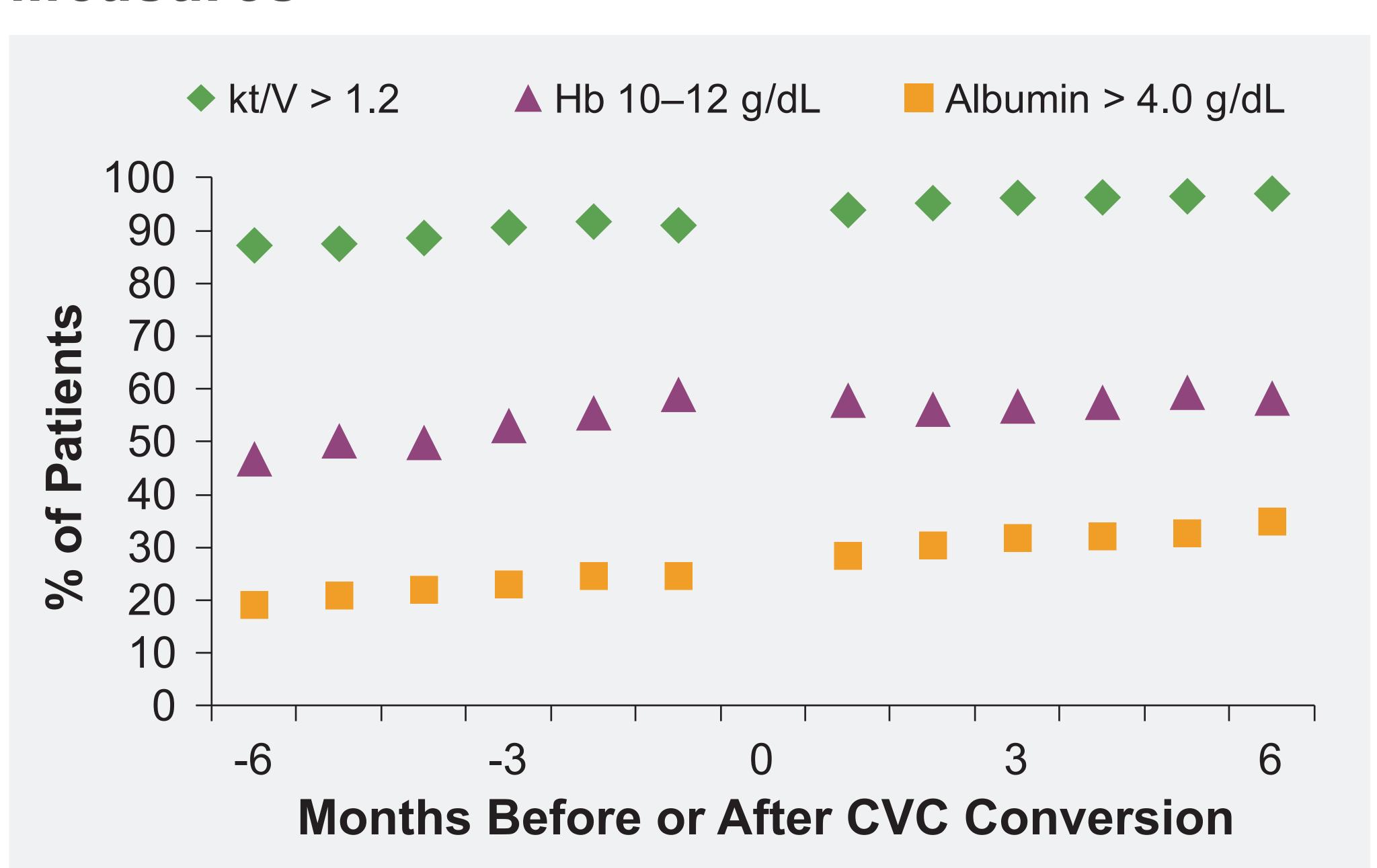
 Of the 3,235 patients transitioning from CVC to a different modality of vascular access, 2,286 patients (70.7%) converted to AVF and 949 patients (29.3%) converted to AVG.

Outcome Measures

	Months -6 to -4 Mean ± SD	Months +4 to +6 Mean ± SD	P Value	% Change
Albumin (g/dL)	3.67 ± 0.45	3.86 ± 0.38	< 0.0001	5.2
Kt/V	1.61 ± 0.39	1.70 ± 0.34	< 0.0001	5.6
Hb (g/dL)	11.63 ± 1.08	11.59 ± 0.87	0.10 (NS)	0.34
BFR (mL/min)	359 ± 41	414 ± 51	< 0.0001	15.3
Heparin (U/tx)	11.44 ± 6.02	4.92 ± 2.70	< 0.0001	57.0
tPa (mg/tx)	0.072 ± 0.24	0.005 ± 0.073	< 0.0001	92.9
Missed tx/mont	h 0.92 ± 1.72	0.85 ± 1.66	0.10 (NS)	7.6

BFR-blood flow rate; Hb-hemoglobin; U-unit; tx-treatment; tPa-tissue plasminogen activator

Proportion of Patients Achieving Outcome Measures



Limitations

 Our study was observational in nature, thus we can only infer association between CVC conversions and the outcomes studied.

Summary

- After CVC removal, statistically significant improvements were measured in patients' mean serum albumin, dialysis adequacy, and BFR values.
- Reductions in the use of heparin and tissue plasminogen activator were measured after the removal of patients' CVC.
- After CVC removal, no statistically significant changes were measured in patients' mean Hb values or missed treatments.
- Our current findings add to the already compelling rationale to minimize the use of CVC for vascular access in HD patients.

References

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