Connected Home Hemodialysis Machine Use and Transition to In-Center Hemodialysis for Home Hemodialysis Patients

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Introduction

- Although home hemodialysis has been growing rapidly in the United States, ongoing expansion is constrained by relatively high rates of transition to in-center hemodialysis (ICHD) during the first year of the therapy.
- The use of internet-connected devices that transmit treatment data to the healthcare provider in real time may help in identifying areas where patients need additional support – potentially aiding in preventing transition to ICHD.

Objective

We aimed to assess whether the use of an internet-connected home hemodialysis machine (CC), which employs a detached tablet and relays treatment data to the dialysis provider, was associated with a decreased rate of transitioning to ICHD from home hemodialysis (HHD).

Methods

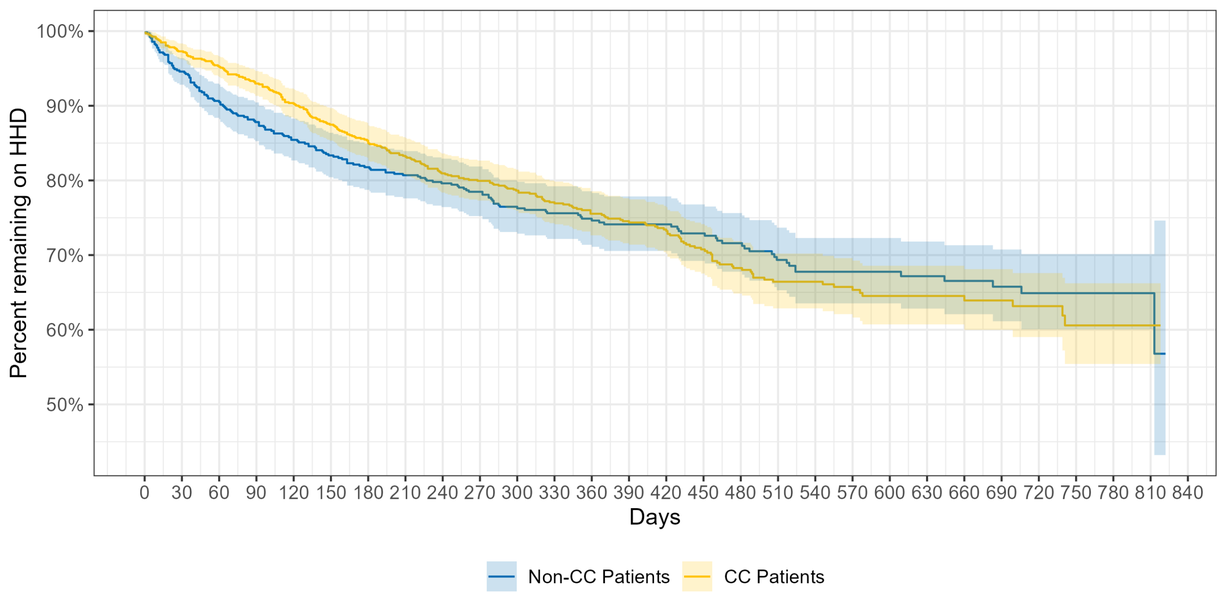
- The study population included all HHD patients who began treatment in a large dialysis provider organization between July 2021 and December 2022 and initiated use of a CC [NxStage System One with Nx2me Connected Health, Fresenius Medical Care] within 30 days of first documented treatment.
- Patient data were obtained from electronic medical records and initiation of CC was ascertained from electronic treatment records.
- Patients were followed from 30 days after HHD initiation until the earliest of transition to ICHD, death, kidney transplant, or end of study follow-up.
- Kaplan-Meier estimation and Cox regression were used to compare technique survival in CC and non-CC patients at 90 days and 360 days; death and transplantation were classified as censoring events.
- Given the limited sample size of patients not using a CC, matching techniques were not able to be employed. Baseline patient characteristics were collected to ensure both the study and control group were comparable.

Results

Table 1: Baseline Patient Characteristics

	Non-CC Patients (n = 637)	CC Patients (n =930)
Female	258 (40.5%)	352 (37.8%)
Dialysis Vintage (yrs.)	2.40 [0.0054, 34.8]	1.68 [0.0027, 29.3]
Age (yrs.)	60.0 [19.0, 97.0]	53.0 [15.0, 99.0]
Race/Ethnicity		
American Indian or Alaskan Native	2 (0.3%)	3 (0.3%)
Asian	19 (3.0%)	31 (3.3%)
Black	214 (33.6%)	252 (27.1%)
Hispanic	58 (9.1%)	104 (11.2%)
Middle Eastern or North African	3 (0.5%)	6 (0.6%)
Native Hawaiian or Other Pacific Islander	7 (1.1%)	12 (1.3%)
Other	26 (4.1%)	33 (3.5%)
White	308 (48.4%)	489 (52.6%)

Figure 1: Kaplan-Meier Curve for Home Patient Retention Over Time by CC Use



Results and Conclusions

- The study cohort included 1,563 patients, among whom 930 (60%) used a CC. Mean age among patients was 55.8 years, and 39% of patients were female.
- In the HHD patient population, CC and non-CC patients had no significant difference in risk of transitioning to ICHD (hazard ratio: 1.00, 95% confidence interval: 0.82, 1.21).
- However, when follow-up was limited to the first 180 days, CC patients experienced a 22% lower rate of transition to ICHD, compared to non-CC patients (hazard ratio: 0.78, 95% confidence interval: 0.61, 1.00).
- The use of a connected cycler was not associated with a differential risk of transition to ICHD from HHD in our study population, although there was evidence of potential benefit during the first 6 months of modality.
- More study is needed to determine whether this technology could positively impact home modality retention.

References

1. Schreiber, M. J., Chatoth, D. K., & Salenger, P. (2021). Challenges and Opportunities in Expanding Home Hemodialysis for 2025. Advances in chronic kidney disease, 28(2), 129–135. https://doi.org/10.1053/j.ackd.2021.06.009

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