

Hypertension and Fluid Dynamics in Patients Undergoing Short Daily versus Conventional Hemodialysis

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INTRODUCTION

Evidence suggests that short daily hemodialysis (SDHD) is associated with cardiovascular benefits such as improved blood pressure (BP) control, reductions in the number of BP medications, and less fluid gain between sessions compared to 3 times per week conventional, in-center hemodialysis (ICHD).

While previous studies had small sample sizes, this study compared outcomes in a large cohort of SDHD patients before and after switching from ICHD.

METHODOLOGY

Analysis 1 — Retrospective case control study of ICHD patients who either remained ICHD (controls, n=170) or switched to SDHD (cases, n=170). Pre- and post-dialysis BP and weight change were compared 6 months prior to modality change through 6 months after modality change from July 2006-August 2008.

Analysis 2 — Cross sectional comparison of medication utilization and the mean number of prescriptions per patient in Dec. 2008, in 98,908 ICHD and 1,430 SDHD patients.

In both analyses, mixed models were adjusted for patient age, race, gender, diabetes, and vascular access type.

Mean age was 52.4 for the SDHD group compared to 60.6 for the ICHD group ($p < 0.01$).

RESULTS

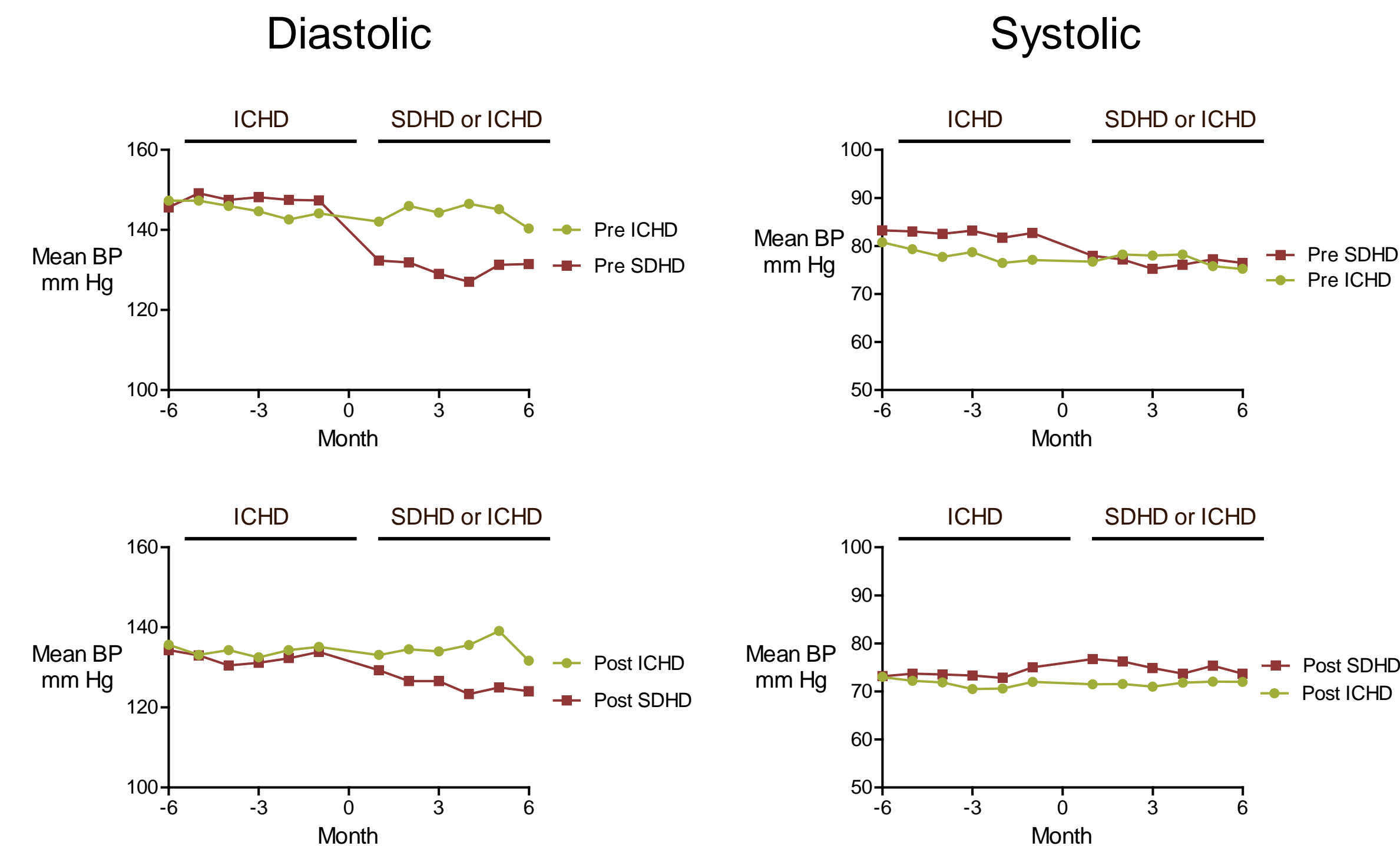


Figure 1. Pre- and Post-dialysis Blood Pressure

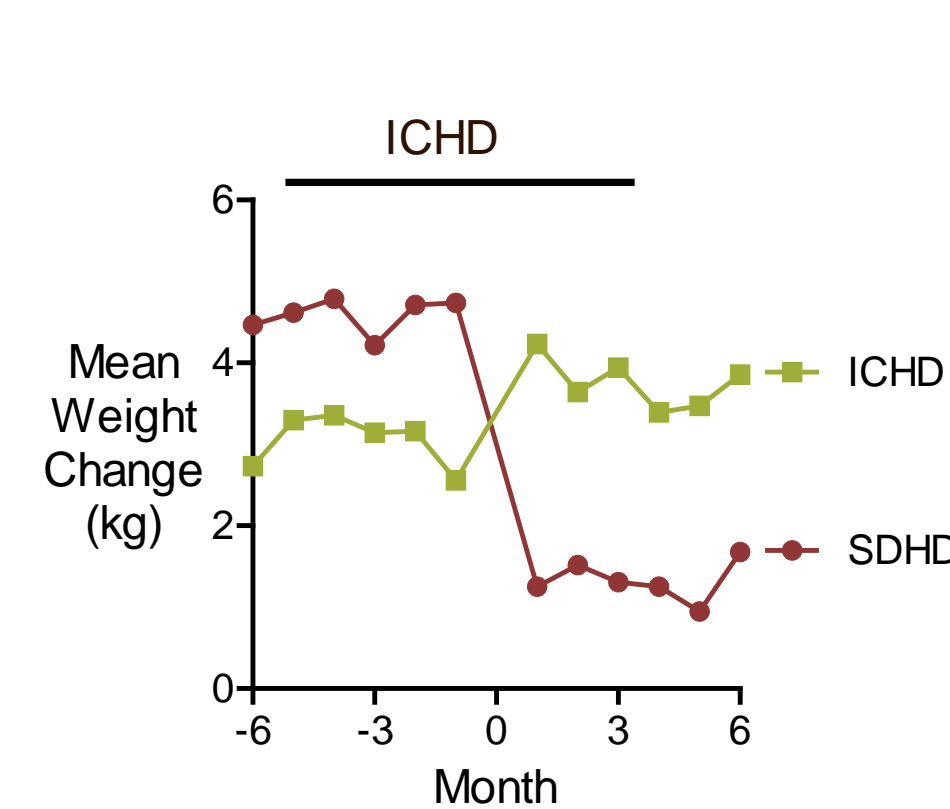


Figure 2. Weight change (pre- minus post-dialysis)

The amount of fluid gained between dialysis sessions was less once patients were on SDHD compared to when they were on ICHD but this was not significant compared to the ICHD group in the same time period.

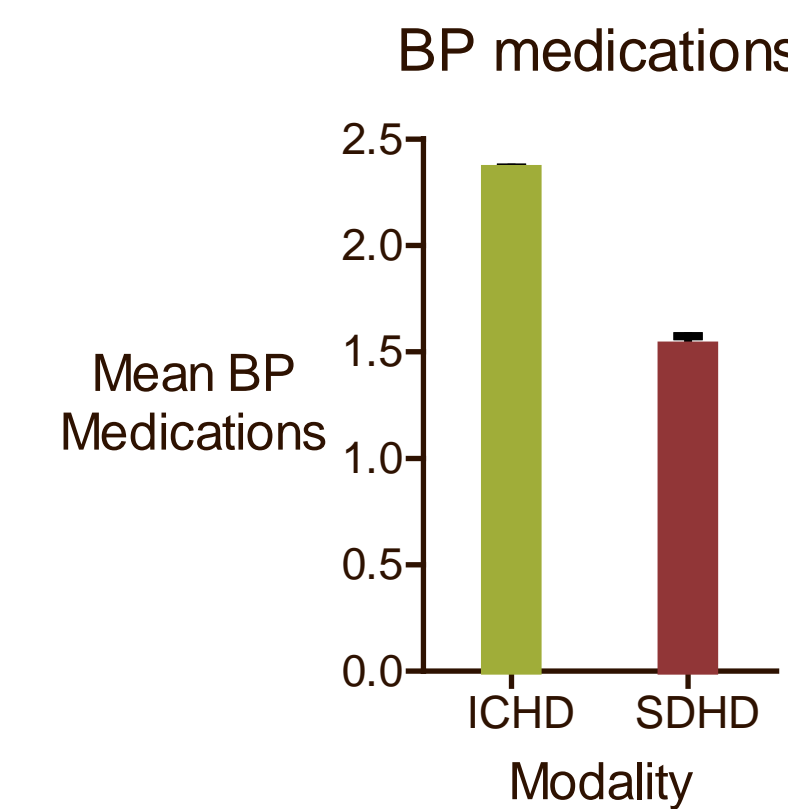


Figure 3. Mean BP Medications

The adjusted mean number \pm SE of BP medications per patient was significantly lower in the SDHD group vs. the ICHD group.

- For SDHD patients, pre-dialysis diastolic BP declined from 81.3 mmHg 6 months before SDHD to 75.5 6 months after starting SDHD (vs. 80.5 to 75.4 for ICHD; $p < 0.0001$).
- Pre-dialysis systolic BP declined from 144.7 to 128.0 mmHg (vs. 143.3 to 142.3 for control; $p < 0.0001$).

CONCLUSIONS

- Compared to patients on ICHD, patients on SDHD:
 - achieved lower pre-dialysis BP,
 - required fewer BP medications, and
 - had less weight gain between dialysis sessions.

KEY LEARNINGS

- The greater frequency of SDHD minimizes interdialytic weight gain allowing intradialytic fluid removal without severe hypotension.
- Less interdialytic weight gain likely contributes to the improvements in pre-dialysis BP control and reduction in the need for anti-hypertensive medication.
- The decreased interdialytic and intradialytic cardiac stress that results in patients on SDHD compared to ICHD should lead to lower long-term risk of cardiovascular morbidity and mortality.

We thank the patients who participated in this study and DaVita Clinical Research[®] (DCR) for support in preparing the analysis and this poster. DCR is committed to advancing the knowledge and practice of kidney care.



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