Conversion of Facility Standard Dialysate Sodium to ≤ 138 mEq/L Is Associated With Reduction in Excessive Interdialytic Fluid Gains Without Evidence of Adverse Effect

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Introduction

- Intradialytic sodium administration, including use of dialysate sodium concentrations in excess of 140 mEq/L, has frequently been prescribed in an attempt to prevent or minimize intradialytic hypotension (IDH) in hemodialysis (HD) patients.
- Evidence that intradialytic sodium loading enhances thirst and thereby contributes to excessive interdialytic weight gain (IDWG) and predialysis hypertension[1,2] prompts the conclusion that use of supraphysiologic dialysate sodium concentrations may lead to high intradialytic ultrafiltration rates (UFR), thereby aggravating rather than preventing IDH.
- In practice, most patients are prescribed the dialysate sodium level that is set as standard for the facility.
- We reasoned that facilities changing dialysate sodium from a higher to lower concentration would show lower rates of excessive IDWG, high intradialytic UFR, and IDH.

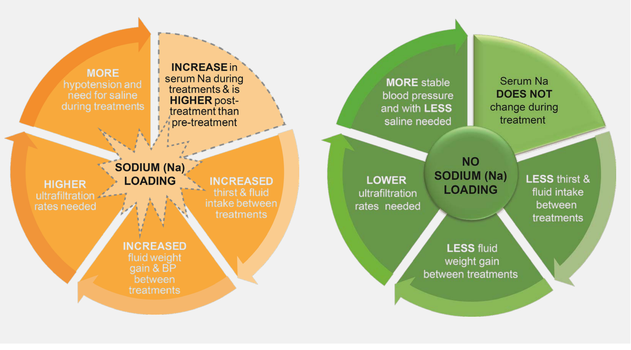
Objective

The objective of this study was to examine the effect of facility-level transition to use of lower dialysate sodium (134-138 mEq/L) on indices of peridialytic fluid balance.

Methods

- We evaluated results from patients treated at 2,130 hemodialysis facilities of a large dialysis organization (LDO) whose governing bodies adopted use of a facility-standard dialysate sodium at concentrations between 134 and 138 mEq/L. Individual patients could receive higher or lower dialysate sodium according to prescription of the treating nephrologist.
- At participating facilities, the change in dialysate sodium was part of a broad, multidisciplinary, multipronged effort to reduce excessive IDWG. Dedicated RN and RD fluid advisors were trained on the effects of sodium loading (Figure 1). Tools and resources, including new patient education materials specific to sodium and fluid management, were developed.
- Recommended practice included:
  - Establish standard dialysate sodium at 134 to 138 mEq/L.
  - Discontinue use of intradialytic sodium modeling.
  - Minimize intradialytic sodium loading (sodium intake not to exceed 2,000 mg/day).
- We determined the proportion of dialytic intervals with IDWG > 5% of body weight, proportion of treatments with ultrafiltration rate > 13 ml/h/kg, frequency of IDH, mortality rate, mean target (prescribed postdialysis) weight, and mean predialysis serum sodium concentration monthly over the period January to August 2014.

Figure 1: Effects of Sodium Loading



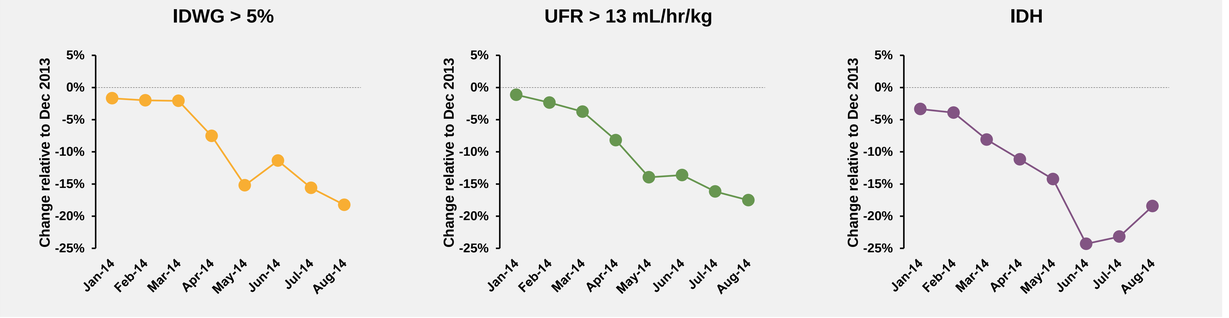
Conclusions

- Use of standard dialysate sodium in the range 134-138 mEq/L, when coupled with a multifaceted quality improvement program, is effective in reducing excessive IDWG and high UFR rates.
  - Reduction of 18.3% in IDWG and 17.5% in UFR > 13 mL/hr/kg was observed over 8 months following implementation.
- The favorable results after transition to lower dialysate sodium were achieved with an 18.4% decrease in IDH.
- There were no discernible effects of dialysate sodium reduction on target weight, predialysis serum sodium concentration, or mortality.
- As of 30 September 2014, 99.3% of LDO facilities had adopted standard dialysate sodium of 138 mEq/L or lower and 97.9% of LDO patients in these facilities were receiving dialysis with prescribed dialysate sodium of 138 mEq/L or lower.

Results

- By August 2014, 97.8% of all patients treated in participating facilities had prescribed dialysate sodium of ≤ 138 mEq/L.
- Between December 2013 and August 2014:
  - the proportion of dialytic intervals with IDWG-> 5% of target weight declined by 18.3%
  - the proportion of treatments with UFR > 13 ml/hr/kg declined by 17.5%
  - frequency of episodes of IDH declined by 18.4%.
  - target weight, predialysis serum sodium, and mortality were unchanged.

Figure 2: Fluid Balance Indices Following Facility-Level Transition to Use of Dialysate Sodium 134-138 mEq/L



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