

Introduction

- International guidelines recommend arteriovenous fistula (AVF) as the preferred type of vascular access for hemodialysis.
- Infections and patency-related complications from central venous catheters (CVC) pose a potential risk for patients.
- Trisodium citrate (TSC) locking solution is a promising alternative to unfractionated heparin (UFH) for prevention of CVC dysfunction.
- However, pseudohyponatremia secondary to TSC contamination of blood specimens obtained from the CVC may potentially lead to profound but unnecessary diagnostic interventions.

Objective

To analyze pre-dialysis sodium (Na) concentration and the prevalence of hyponatremia in relation to the type of locking solution (TSC vs UFH) and vascular access type in a large cohort of hemodialysis patients.

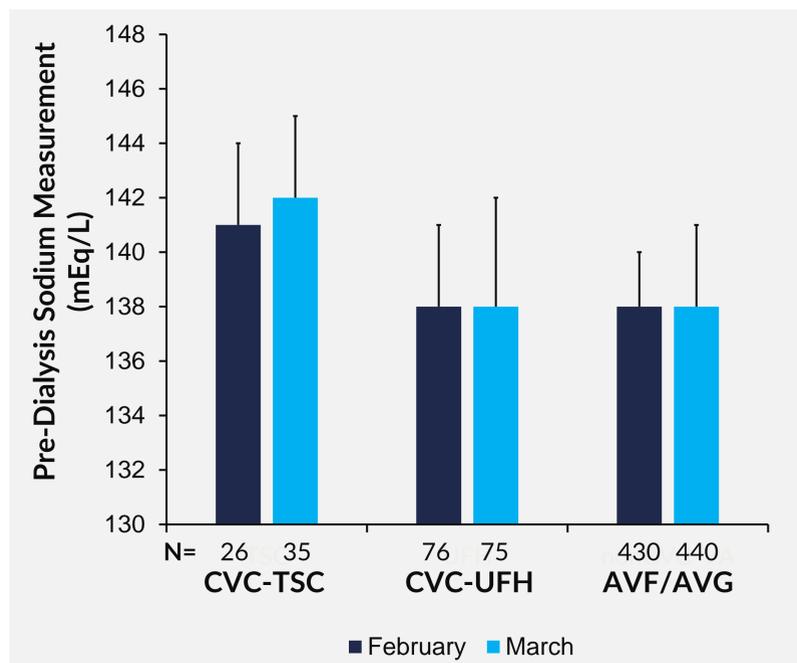
Methods

- The population studied consisted of 543 prevalent hemodialysis patients (45% female, mean age 67 ± 14 years) treated in a standard hemodialysis program (100% High Flux membranes, 94% HD time ≥ 12h/week, 94% spKt/V ≥ 1.3, 18.5% CVC) in Poland.
- We analyzed laboratory results from February and March 2017. The pre-dialysis Na concentration was compared between patients with CVC locked with 30%TSC, UFH (5000 IU/mL), and non-CVC types of VA (AVF, AV grafts). The proportion of patients with pre-dialysis Na ≥ 145 mEq/L (hyponatremia) was analyzed in both groups and from both months separately.
- Data were analyzed using descriptive statistics, ANOVA, t-test, and X² tests, as appropriate.

Results

- The mean pre-dialysis serum Na concentration was significantly higher in patients with a CVC who used TSC locking solution compared to either those who used a CVC with UFH locking solution, or to those who used either an AVF or AVG for vascular access (Figure 1).
 - The highest serum Na concentration was 171 mEq/L. The sample was obtained from a patient with an uneventful follow up. Repeated analysis of serum drawn from a peripheral vein showed a Na concentration of 138 mEq/L.

Figure 1. Mean Pre-Dialysis Serum Sodium Concentration by Vascular Access and Locking Solution Type

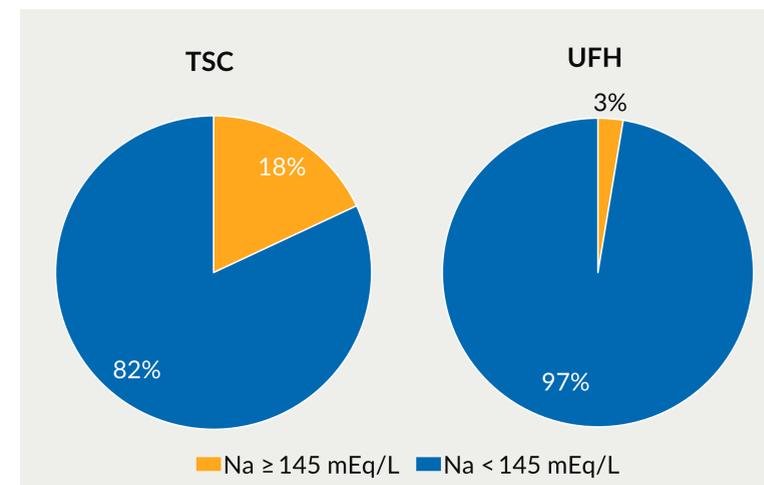


ANOVA $P < 0.001$ for February and March

Abbreviations: AVF, arteriovenous fistula; AVG, arteriovenous graft; CVC, central venous catheter; TSC, trisodium citrate; UFH, unfractionated heparin.

- The proportion of serum samples with Na ≥ 145 mEq/L was significantly higher in patients with CVCs locked with TSC compared to patients with UFH as the locking solution (Figure 2).

Figure 2. Proportion of Pre-Dialysis Serum Sodium Measurements ≥ 145 mEq/L by CVC Locking Solution



Difference between TSC and UFH is statistically significant ($X^2 P < 0.001$).
Abbreviations: TSC, trisodium citrate; UFH, unfractionated heparin.

Conclusions

- Pseudohyponatremia may occur in hemodialysis patients utilizing a CVC for vascular access when 30% TSC is used as the locking solution.
- The need for diagnostic laboratory investigations may be lowered by strictly following the recommended procedures for blood sample collection from a CVC.
 - This includes discarding a proper volume of blood.

References

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Acknowledgments

The authors acknowledge the invaluable help of head physicians of DaVita Clinics in Poland and IT Manager Artur Janiszewski for their help in collection of data.

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American Society of Nephrology Kidney Week, October 31 - November 5, 2017; New Orleans, LA