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ASSOCIATION OF SODIUM VARIABILITY AND DECLINE IN RESIDUAL KIDNEY FUNCTION AMONG THRICE-WEEKLY HEMODIALYSIS PATIENTS:

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Sodium abnormalities are common among patients with end-stage renal disease and are associated with higher mortality risk. This study examined the association between sodium variability and decline in residual kidney function (RKF) among conventional hemodialysis (HD) patients.

The cohort consisted of 2,813 patients who initiated thrice-weekly HD from 2007-2011. Sodium variability was defined as the residual standard error (RSE) of time on sodium in the 6-months post-HD initiation. Sodium RSE was categorized using quartiles. Rapid decline in RKF was defined as a decline in KRU of more than 20% over a 6-month period. The association between sodium RSE and rapid decline in RKF was examined using logistic regression models with adjustments for case-mix variables, baseline KRU, and ultrafiltration volume RSE.

The cohort mean age was 63 ± 14 yrs, 65% were men, 22% African American, and 69% diabetics. Rapid decline in RKF was observed in 54%, 56%, 54% and 59% of patients in sodium RSE quartiles from lowest to highest quartile ($p = 0.043$). The highest quartile of sodium RSE was associated with a higher odds of rapid RKF decline: odds ratio (95% confidence interval) was 1.25 (1.02-1.55). After adjustment: odds ratios were 1.25 (1.01-1.55) and 1.37 (1.10-1.71) for case-mix and case-mix plus baseline KRU. Further adjustment of baseline sodium and ultrafiltration volume showed odds ratio of 1.23 (0.97-1.55) (reference: first quartile sodium RSE) [Figure 1A]. In a mixed effects model, predicted average KRU decline according to baseline sodium variability did not differ ($p = 0.6433$) [Figure 1B].

In incident thrice-weekly HD patients, higher sodium variability was associated with higher odds of rapid decline in RKF. Further studies examining the underlying mechanisms of this relationship and their effect on survival are needed.

