Association of Thyroid Status Prior To Transition to End-Stage Renal Disease with Early Dialysis Mortality

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Objectives: Advanced chronic kidney disease (CKD) patients, including those receiving dialysis, have a high prevalence of thyroid dysfunction. Whereas hypothyroidism is associated with higher death risk in end-stage renal disease (ESRD) patients, no studies have examined whether thyroid status in the pre-ESRD period impacts mortality after dialysis initiation.

Methods: Among US Veterans transitioning to dialysis over 10/2007-9/2011, we examined the association of pre-ESRD serum thyrotropin (TSH) levels averaged over the one-year pre-dialysis (“prelude”) period with all-cause mortality in the first year following dialysis initiation using survival models.

Results: Among 15,335 patients in the one-year prelude cohort, TSH levels >5.0mIU/L were associated with higher mortality in expanded case-mix Cox models (reference: TSH 0.5-<3.0mIU/L): adjusted HR (aHR) (95%CI) 1.18 (1.05-1.31). Similar findings were observed for TSH levels >5.0mIU/L and mortality in the two-year and five-year cohorts: aHRs (95%CI) 1.10 (1.01-1.20) and 1.13 (1.05-1.22), respectively. Analyses of finer gradations of TSH in the one-year prelude cohort demonstrated that incrementally higher levels >5.0mIU/L were associated with increasingly higher mortality in expanded case-mix models (reference: TSH 0.5-3.0mIU/L): aHRs (95%CI) 1.16 (1.02-1.31) and 1.27 (1.02-1.58) for TSH levels >5.0-10.0mIU/L and >10.0mIU/L, respectively. In the two-year and five-year cohorts, the mortality associations persisted most strongly for those with TSH >10.0mIU/L, particularly after laboratory covariate adjustment.

Conclusions: Among new ESRD patients, there is a dose-dependent relationship between higher pre-ESRD TSH levels >5.0mIU/L and post-ESRD mortality. Further studies are needed to determine the impact of TSH reduction with thyroid hormone supplementation on outcomes in this population.

Thyroid Status and Mortality Risk
Finer TSH Gradations and Mortality Risk