

Short Communication: Older Adults with Subclinical Hypothyroidism

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Abstract

Subclinical hypothyroidism is frequently diagnosed in older adults, yet the clinical benefits of initiating thyroid hormone replacement remain uncertain. Thyroid dysfunction has been associated with alterations in renal hemodynamics and glomerular filtration, suggesting that normalization of thyroid status may contribute to improved kidney function. However, evidence regarding this relationship in elderly individuals is limited.

Keywords: Subclinical hypothyroidism; Thyroid hormone replacement; Levothyroxine therapy; Aging.

Short Communication

Subclinical hypothyroidism is a common endocrine disorder among older adults and is characterized by elevated serum thyroid-stimulating hormone (TSH) concentrations despite normal circulating thyroid hormone levels. Its prevalence increases with advancing age, making it a frequent clinical finding in geriatric practice. Although many individuals remain asymptomatic, persistent thyroid dysfunction has been associated with adverse cardiovascular, metabolic, and renal outcomes. Consequently, determining whether elderly patients should receive thyroid hormone replacement remains an important clinical challenge.

The thyroid and kidneys maintain a close physiological relationship. Thyroid hormones regulate renal blood flow, cardiac output, vascular resistance, and sodium homeostasis, all of which influence glomerular filtration. Conversely, impaired kidney function can alter thyroid hormone metabolism and clearance, creating a bidirectional interaction between the two organ systems. Even mild reductions in thyroid hormone activity may decrease renal perfusion and contribute to reductions in estimated glomerular filtration rate (eGFR).

Several observational studies have reported an association between elevated TSH concentrations and declining renal function. However, evidence demonstrating that correction of subclinical hypothyroidism improves kidney function, particularly in elderly populations, remains limited. Most available studies have been retrospective, involved younger populations, or included relatively short follow-up periods, limiting their clinical applicability.

Older adults frequently present with multiple comorbidities, including chronic kidney disease, hypertension, diabetes mellitus, and cardiovascular disorders. These conditions may accelerate renal deterioration and complicate therapeutic decisions regarding thyroid hormone replacement. While levothyroxine therapy effectively restores euthyroidism, concerns remain regarding overtreatment, especially in frail elderly patients who may be more susceptible to cardiac complications and osteoporosis.

The present study was designed to investigate the effect of thyroid hormone replacement therapy on renal function in elderly individuals with subclinical hypothyroidism over a

prolonged follow-up period. We hypothesized that correction of thyroid dysfunction would preserve kidney function by improving renal hemodynamics and slowing the decline in eGFR. The findings may provide additional evidence to guide individualized treatment strategies for elderly patients with concurrent thyroid dysfunction and impaired renal function.

This prospective comparative study enrolled 90 adults aged 65 years and older who were diagnosed with subclinical hypothyroidism according to established biochemical criteria. Eligible participants demonstrated persistently elevated serum thyroid-stimulating hormone concentrations with normal free thyroxine levels on repeated laboratory testing. Individuals with overt hypothyroidism, severe systemic illness, active malignancy, advanced liver disease, dialysis-dependent kidney disease, or recent thyroid surgery were excluded.

Participants were allocated into two groups based on treatment decisions made during routine clinical practice. The intervention group received individualized levothyroxine therapy, while the comparison group underwent regular clinical observation without thyroid hormone replacement. Levothyroxine dosage was adjusted periodically to maintain TSH concentrations within the recommended reference range while minimizing adverse effects.

Baseline assessments included demographic characteristics, medical history, medication use, blood pressure, body mass index, serum creatinine, TSH, free thyroxine, lipid profile, fasting blood glucose, and estimated glomerular filtration rate calculated using a standardized equation. Follow-up evaluations were performed at predefined intervals over 36 months.

The primary outcome was the longitudinal change in eGFR between treatment groups. Secondary outcomes included changes in thyroid hormone profiles, serum creatinine concentrations, treatment safety, cardiovascular adverse events, and medication tolerability.

Continuous variables were expressed as mean $\pm$ standard deviation, whereas categorical variables were summarized as frequencies and percentages. Differences between groups were analyzed using Student's t-test or repeated-measures analysis of variance where appropriate. Statistical significance was defined as a p-value below 0.05. Ethical approval was obtained from the institutional ethics committee, and informed consent was obtained from all participants before enrollment.

Conclusion

Thyroid hormone replacement was generally well tolerated, with only a small number of participants requiring dose adjustments because of mild cardiovascular symptoms. This highlights the importance of individualized dosing, regular monitoring of thyroid function, and careful assessment of comorbid conditions when managing elderly patients.

Although the results are encouraging, the study has limitations, including the relatively small sample size and non-randomized comparative design, which may affect the generalizability of the findings. Larger multicenter randomized controlled trials with longer follow-up are needed to establish the long-term renal benefits, evaluate clinical outcomes, and identify the patient populations most likely to benefit from treatment.