

Original Article

Assessment of renal function in subclinical hypothyroidism

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ABSTRACT:

Background: The present study was conducted for assessing the renal function in subclinical hypothyroidism. **Materials & methods:** A total of 50 patients with presence of subclinical hypothyroidism were enrolled. Another set of 50 subjects with presence of euthyroid status were also enrolled. Complete medical history of all the patients was recorded. Blood samples were obtained from all the patients. Serum renal profile was evaluated of all the patients. Assessment of the results was done using SPSS software. Man-Whitney U test was used for comparison of renal profile among euthyroid subjects and subclinical hypothyroidism patients. **Results:** Mean serum creatinine levels among patients with subclinical hypothyroidism and euthyroid status was 0.845 mg/dL and 0.794 mg/dL respectively. Mean eGFR levels among patients with subclinical hypothyroidism and euthyroid status was 88.12 ml/min/1.73m² and 93.45 ml/min/1.73m² respectively. Significant results were obtained while comparing the renal profile among patients with subclinical hypothyroidism and euthyroid. **Conclusion:** Significant alteration of renal profile occurs in patients with thyroid abnormalities.

Key words: Renal, Subclinical, Hypothyroidism

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INTRODUCTION

Subclinical hypothyroidism (SCH), also called mild thyroid failure, is diagnosed when peripheral thyroid hormone levels are within normal reference laboratory range but serum thyroid-stimulating hormone (TSH) levels are mildly elevated. This condition occurs in 3% to 8% of the general population. It is more common in women than men, and its prevalence increases with age. Of patients with SCH, 80% have a serum TSH of less than 10 mIU/L.¹⁻³

In end-stage renal disease, a higher prevalence of sHypo has been noted compared with the general population. In patients with sHypo and chronic kidney disease (CKD), LT4-Tx attenuated the decline in renal function. sHypo was associated with higher mortality than the euthyroid state in patients with renal failure requiring hemodialysis. These results demonstrated that sHypo worsens the clinical course of CKD. However, a meta-analysis found no correlation between sHypo and decline in kidney function.⁴⁻⁶ Hence; the present study was conducted for assessing the renal function in subclinical hypothyroidism.

MATERIALS & METHODS

The present study was conducted for assessing the renal function in subclinical hypothyroidism. A total of 50 patients with presence of subclinical hypothyroidism were enrolled. Another set of 50 subjects with presence of euthyroid status were also enrolled. Complete medical history of all the patients was recorded. Blood samples were obtained from all the patients. Serum renal profile was evaluated of all the patients. Assessment of the results was done using SPSS software. Man-Whitney U test was used for comparison of renal profile among euthyroid subjects and subclinical hypothyroidism patients.

RESULTS

Mean age of the subjects with subclinical hypothyroidism and euthyroid status was 48.3 years and 49.1 years respectively. There were 31 males and 19 females among patients with presence of subclinical hypothyroidism while there were 33 males and 17 females among patients with euthyroid status. Mean serum creatinine levels among patients

with subclinical hypothyroidism and euthyroid status was 0.845 mg/dL and 0.794 mg/dL respectively. Mean eGFR levels among patients with subclinical hypothyroidism and euthyroid status was 88.12

ml/min/1.73m² and 93.45 ml/min/1.73m² respectively. Significant results were obtained while comparing the renal profile among patients with subclinical hypothyroidism and euthyroid.

Table 1: Comparison of renal profile among patients with subclinical hypothyroidism and euthyroid

Renal profile	Subclinical hypothyroidism	Euthyroid	p-value
Serum creatinine (mg/dL)	0.845	0.794	0.001*
eGFR (mL/min/1.73m ²)	88.12	93.45	0.000*

*: Significant

DISCUSSION

Subclinical hypothyroidism characteristically presents with elevated thyroid-stimulating hormone (TSH) and normal thyroxine (T4) levels. Various studies have reported the incidence of subclinical hypothyroidism to be 3-15% depending on the population studied. The prevalence of this disorder is bound to increase due to the increased availability of thyroid function testing. Although TSH levels vary widely in the population, intraindividual variation is minimal; this is secondary to a unique individual setpoint in the hypothalamic-pituitary axis. Subclinical hypothyroidism correlates with an increased risk of fatal and non-fatal coronary artery disease (CAD) events, congestive heart failure and fatal stroke.⁶⁻⁸ Hence; the present study was conducted for assessing the renal function in subclinical hypothyroidism.

Mean age of the subjects with subclinical hypothyroidism and euthyroid status was 48.3 years and 49.1 years respectively. There were 31 males and 19 females among patients with presence of subclinical hypothyroidism while there were 33 males and 17 females among patients with euthyroid status. Mean serum creatinine levels among patients with subclinical hypothyroidism and euthyroid status was 0.845 mg/dL and 0.794 mg/dL respectively. In a study conducted by Patil VP et al, authors evaluated the renal function in subclinical hypothyroidism. A total of 608 subjects of either sex were included in the study and were divided into 3 groups: (1) SCH, (2) overt hypothyroidism (OHT), and (3) euthyroidism (ET). TSH, free triiodothyronine, free thyroxine, and serum creatinine were estimated and eGFR was calculated using modification of diet in renal disease study equation and the chronic kidney disease epidemiology collaboration equations. Serum creatinine levels were higher and eGFR was lower significantly in the subclinical hypothyroid group when compared to the control ET group (P < 0.001). The overtly hypothyroid group had significantly higher levels of serum creatinine and lower eGFR when compared to both the groups (P < 0.001). Significant correlation between TSH, creatinine, and eGFR was found in OHT group only. Linear regression analysis showed the regression in creatinine upon TSH is attributable to 44.5% among OHT group, 48.2% in SCH group. It can be concluded that the SCH group behaves biochemically similar to

OHT group and changes in serum creatinine reflect tissue hypothyroidism in SCH cases.¹⁰

Mean eGFR levels among patients with subclinical hypothyroidism and euthyroid status was 88.12 ml/min/1.73m² and 93.45 ml/min/1.73m² respectively. Significant results were obtained while comparing the renal profile among patients with subclinical hypothyroidism and euthyroid. Chonchol M et al, in another study, assessed the prevalence of subclinical hypothyroidism in patients with chronic kidney disease. Cross-sectional data from 3089 adult outpatients, who were consecutively referred by general practitioners for routine blood testing over the last two years, were analyzed. Glomerular filtration rate (GFR) was estimated by the abbreviated Modification of Diet in Renal Disease equation. Among 3089 adult participants, 293 (9.5%) had subclinical primary hypothyroidism and 277 (9%) had an estimated GFR <60 ml/min per 1.73 m². The prevalence of subclinical primary hypothyroidism increased from 7% at an estimated GFR ≥90 ml/min per 1.73 m² to 17.9% at an estimated GFR <60 ml/min per 1.73 m² (P < 0.0001 for trend). Compared with participants with an estimated GFR ≥60 ml/min per 1.73 m², those with estimated GFR <60 ml/min per 1.73 m² had an increased odds of subclinical primary hypothyroidism after adjusting for age, gender, fasting plasma glucose, total cholesterol, and triglyceride concentrations. These findings suggested that subclinical primary hypothyroidism is a relatively common condition (~18%) among persons with CKD not requiring chronic dialysis.¹¹

CONCLUSION

Significant alteration of renal profile occurs in patients with thyroid abnormalities.

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