

Assessment of Association between Thyroid Disorders and Gout

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Abstract

Background: Thyroid hormones (THs) play their parts in multiple events, including development, growth, metabolism, and reproduction. Recently, attentions have been paid to THs again due to the increasing prevalence of metabolic diseases, because THs boost the body energy metabolism. Hence; the present study was conducted for assessing association between thyroid disorders and gout. **Subjects and Methods:** A total of 50 subjects were enrolled. Complete demographic details of all the subjects were obtained. Out of 50 subjects, 25 subjects were of subclinical hypothyroidism while the remaining 25 subjects were healthy control. Complete demographic details of all the subjects were obtained. The thyroid-stimulating hormone (TSH) test was conducted in all the patients. Triiodothyronine (T3) and thyroxine (T4) hormonal tests were also carried out. The diagnosis of subclinical hypothyroidism was performed by the physician by interpreting the results of tests based on increased TSH levels based on the age and normal range of T3 and T4. Serum uric acid levels were obtained from all the patients and the results were subjected to statistical analysis. All the results were obtained and analysed by SPSS software. **Results:** Mean TSH levels of the subjects of the study group and control group was 9.2 mIU/L and 4.5 mIU/L. Significant results were obtained while comparing the mean TSH levels among the subjects of the study groups. However; non-significant results were obtained while comparing the mean uric acid levels among the patients of the study group and control group. **Conclusion:** From the above results, authors conclude that no significant correlation exist between thyroid disorders and gout.

Keywords: Thyroid, Gout.

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Introduction

Thyroid hormones (THs) play their parts in multiple events, including development, growth, metabolism, and reproduction. Recently, attentions have been paid to THs again due to the increasing prevalence of metabolic diseases, because THs boost the body energy metabolism. Research on THs mainly examines the roles of TH in glucose oxidation, oxidative phosphorylation acceleration, fat degradation, as well as additional metabolic activities. In the meantime, TH mimetics are proposed in managing diabetes and obesity. Therefore, it is of vital importance to understand the population-based thyroid dysfunction distribution, as this represents a candidate risk factor of cardiovascular disease, hypercholesterolemia, arrhythmia, osteoporosis, as well as neuropsychiatric diseases. Those adverse thyroid dysfunction effects on the metabolic system have been extensively recognized; however, the associations of THs levels with the hyperuricemia risk among euthyroid subjects remain unclear so far.^[1-3]

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Subjects and Methods

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enrolled. Complete demographic details of all the subjects were obtained. Out of 50 subjects, 25 subjects were of subclinical hypothyroidism while the remaining 25 subjects were healthy control. Complete demographic details of all the subjects were obtained. The thyroid-stimulating hormone (TSH) test was conducted in all the patients. Triiodothyronine (T3) and thyroxine (T4) hormonal tests were also carried out. The diagnosis of subclinical hypothyroidism was performed by the physician by interpreting the results of tests based on increased TSH levels based on the age and normal range of T3 and T4. Serum uric acid levels were obtained from all the patients and the results were subjected to statistical analysis. All the results were obtained and analysed by SPSS software.

Results

The present study was conducted for assessing association between thyroid disorders and gout. A total of 50 subjects were enrolled. Complete demographic details of all the subjects were obtained. Out of 50 subjects, 25 subjects were of subclinical hypothyroidism while the remaining 25 subjects were healthy control. Mean age of the subjects of the study group and control group was 23.3 years and 21.8 years respectively. Mean TSH levels of the subjects of the study group and control group was 9.2 mIU/L and 4.5 mIU/L. Significant results were obtained while comparing the mean TSH levels among the subjects of the study groups. However; non-significant results were obtained while comparing the mean uric acid levels among the patients of the study group and control group.

Table 1: Demographic data

Variable	Study group	Control group
Mean age (years)	23.3	21.8
Males (n)	16	18
Females (n)	9	7

Table 2: Comparison of thyroid profile

Variable	Study group	Control group	p- value
TSH (mIU/L)	9.2	4.5	0.00*
T3 (ng/mL)	143.2	146.8	0.82
T4 (micgr/dL)	8.6	8.2	0.39

*: Significant

Table 3: Comparison of thyroid profile

Uric acid (mg/dL)	Study group	Control group	p- value
Mean	4.39	4.05	0.13
SD	1.23	1.58	

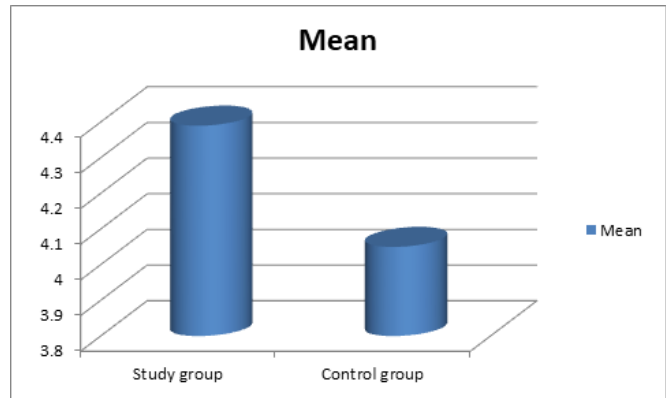


Figure 1: Comparison of thyroid profile

Discussion

Uric acid (UA) is the final product of endogenous and dietary purine metabolism in human beings, and serum UA levels reflect the balance between purine breakdown and UA excretion rates. During the last few years, a growing attention has been paid to uric acid due to its involvement in “cardio-nephro-metabolic” disorders. Several epidemiological studies have reported a relation between serum UA levels and traditional cardiovascular risk factors, including hypertension, metabolic syndrome and diabetes mellitus, suggesting a possible pathophysiologic link between these conditions. Moreover, epidemiological and experimental data also support a strong association between hyperuricemia cardiovascular diseases, brain diseases and renal dysfunction.^[6-10] Hence; the present study was conducted for assessing association between thyroid disorders and gout.

A total of 50 subjects were enrolled. Mean TSH levels of the subjects of the study group and control group was 9.2 mIU/L and 4.5 mIU/L. Bruderer SG et al assessed the risk of developing incident gout in association with hypothyroidism or hyperthyroidism. The study population encompassed 68,159 incident gout cases, of whom 78.8% were male, and the same number of matched controls. There was no increased risk of gout in patients with hypothyroidism: adjusted OR of gout of 1.12 (95% CI 1.05–1.20) compared with no hypothyroidism. Current short-term treatment of thyroid hormone replacement therapy was associated with an adjusted OR of gout of 1.54 (95% CI 1.24–1.92), compared

with no treatment. Neither hyperthyroidism nor current treatment with thyroid suppression therapy was associated with gout.^[11]

In the present study, significant results were obtained while comparing the mean TSH levels among the subjects of the study groups. However; non-significant results were obtained while comparing the mean uric acid levels among the patients of the study group and control group. Desideri G et al evaluated the influential role of levothyroxine (L-T4) replacement therapy on circulating levels of UA in patients with recent onset post-thyroidectomy subclinical hypothyroidism. Circulating levels of thyroid hormones, UA and other metabolic parameters were assessed in 155 recently thyroidectomized patients (131 females, mean age 51.1 ± 12.7 years) at baseline (5-7 day after surgery) and after 2 months under replacement therapy with L-T4. At baseline, circulating levels of thyroid hormones were indicative of a subclinical hypothyroidism (TSH 8.2 ± 5.1 mU/mL, FT3 2.1 ± 0.7 pg/mL, FT4 9.2 ± 3.4 pg/mL). The mean serum UA concentration was 5.0 ± 1.3 mg/dL, while the prevalence of hyperuricemia, defined by serum UA levels > 6 mg/dL, was 22.6%. Serum UA levels at baseline were significantly correlated with HOMA-IR index ($r = 0.475$, $p < 0.0001$). After 2 months under the replacement therapy with L-T4, both serum UA levels (- 1.2 ± 0.9 mg/dL, $p < 0.0001$ vs. baseline) and HOMA-IR (- 0.3 ± 1.5 mmol/L, $p = 0.0328$ vs. baseline) significantly decreased. Multivariate regression analysis revealed that changes in HOMA-IR explained 23% of the variations of serum UA levels under L-T4 replacement therapy.^[12]

Conclusion

From the above results, authors conclude that no significant correlation exist between thyroid disorders and gout.

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