



A Study of Systemic Hypertension with Subclinical Hypothyroidism

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ABSTRACT

Thyroid dysfunction, both hypothyroidism and hyperthyroidism, may increase the risk of hypertension. However, it is still controversial whether mild thyroid dysfunction, such as subclinical hypothyroidism, affects blood pressure. Aim of this study was to explore relationship of hypertension with different levels of thyroid stimulating hormone in subjects with subclinical hypothyroidism and euthyroidism. This cross sectional study was conducted at Department of General Medicine of a tertiary care centre over one year. A total of 500 newly diagnosed hypertensive subjects were evaluated for demographic characteristics, body mass index, smoking habits, serum TSH, and free T4. Subjects were further divided into various groups depending on TSH levels. Statistical software, SPSS version 17.0 was used for analysis. In the present study, Systolic BP and diastolic BP was higher in subclinical hypothyroidism subjects than that of the euthyroid group ($P < 0.05$ for both). From this study, we can conclude that subclinical hypothyroid subjects have more tendencies to develop hypertension than euthyroid subjects. Therefore subclinical hypothyroid subjects should be regularly screened for hypertension.

Keywords: Hypertension, Hypothyroidism, Euthyroidism

INTRODUCTION

Thyroid dysfunction, both hypothyroidism and hyperthyroidism, may increase the risk of hypertension.[1] However, it is still controversial whether mild thyroid dysfunction, such as subclinical hypothyroidism, affects blood pressure. Subjects with subclinical hypothyroidism have elevated thyroid-stimulating hormone (thyrotropin, TSH) levels and normal free thyroxine (T4) levels.[2] Previous studies have suggested that subclinical abnormalities in TSH levels are associated with detrimental effects on the cardiovascular system.[3] Studies have also suggested an association between subclinical hypothyroidism and hypertension, which has been subsequently confirmed by some, but not all, large cross-sectional and case-control studies.[3] Aim of this study was to explore relationship of hypertension with different levels of thyroid stimulating hormone in subjects with subclinical hypothyroidism and euthyroidism.

MATERIALS AND METHODS

A total of 500 newly diagnosed hypertensive subjects were evaluated for demographic characteristics, body mass index, smoking habits, serum TSH, and free T4. Subjects were further divided into various groups depending on TSH levels. Overt hypothyroid and hyperthyroid subjects were excluded from the study.

RESULTS

Table 1 shows the characteristics of all subjects included in our study.

Table 1. Patient's Characteristics

	Subclinical Hypothyroidism	Euthyroidism
Total Number of Subjects	41	439
Age (Years)	50.4±12.4	48.9±11.3
Gender (Female %)	78.1	70.4
Smoking Habits (%)	14.6	13.9
BMI (Kg/M ²)	24.6±3.6	24.1±3.1
TSH	7.1±2.1	2.5±1.2
Systolic BP (mmHg)	130.5±20.4	127.3±19.4
Diastolic BP (mmHg)	82.9±12.8	81.1±12

Systolic BP and diastolic BP was higher in subclinical hypothyroidism subjects than that of the euthyroid group (P<0.05 for both).

DISCUSSION

The results of our study suggest an association between subclinical hypothyroidism and increased blood pressure levels. Several mechanisms could explain why subclinical hypothyroidism has an adverse effect on blood pressure. Clinical hypothyroidism is known to increase blood pressure due to increased systemic vascular resistance.

Various studies indicate that cardiovascular disorders have existed in the subclinical hypothyroidism stage. Luboshitzky *et al.*[4] found that the prevalence of hypertension in the subclinical hypothyroidism group was significantly higher than that in the normal control group, supporting our conclusion. Rotterdam's study showed that subclinical hypothyroidism was an independent risk factor for atherosclerosis and myocardial infarction. Blood hypercoagulability, blood viscosity and lipid abnormalities presenting in subclinical hypothyroidism patients could increase the risk for atherosclerosis.[5] These factors may also be involved in the pathogenesis in which subclinical hypothyroidism affects blood pressure.

CONCLUSION

From this study, we can conclude that subclinical hypothyroid subjects have more tendencies to develop hypertension than euthyroid subjects. Therefore subclinical hypothyroid subjects should be regularly screened for hypertension.

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