PREVALENCE OF SUBCLINICAL HYPOTHYROIDISM AMONG PATIENTS WITH ACUTE CORONARY SYNDROME

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List of Abbreviations

AACE	American Association of Clinical Endocrinologist
ACS	Acute coronary syndrome
AF	Atrial fibrillation
ATA	American Thyroid Association
CAD	Coronary artery disease
CHB	Complete heart block
DM	Diabetes mellitus
ECG	Electrocardiogram
ESC	European Society of Cardiology
FT3	Free T3
FT4	Free T4
HDL	High density lipoprotein
HTN	Hypertension
IDL	Intermediate density lipoprotein
LDL	Low density lipoprotein
LT3	L-triiodothyronine
LT4	L-thyroxine
NEJM	New England Journal of Medicine
NHANES	National Health and Nutritional Examination Survey
NSTEMI	Non-ST elevation myocardial infarction
NTI	Non thyroidal illness
NYHA	New York Heart Association
SCH	Subclinical hypothyroidism
STEMI	ST elevation myocardial infarction

Tg Ab	**Antithyroglobulin antibody**
TPO Ab	**Antithyroid peroxidase antibody**
TSH	**Thyroid stimulating hormone**
UA	**Unstable angina**
VF	**Ventricular fibrillation**
VLDL	**Very low density lipoprotein**
Vs.	**Versus**
VT	**Ventricular tachycardia**

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INTRODUCTION

Subclinical hypothyroidism (SCH) is defined as a serum thyroid-stimulating hormone (TSH) level above the upper limit of normal despite normal levels of serum free thyroxine(1).

Subclinical hypothyroidism or mild thyroid failure is a common problem, with a prevalence of 3% to 8% in the population without known thyroid disease (2, 3). The prevalence increases with age and is higher in women (2). After the sixth decade of life, the prevalence in men approaches that of women, with a combined prevalence of 10%. Antithyroid antibodies can be detected in 80% of patients with SCH, and 80% of patients with SCH have a serum TSH of less than 10 mIU/L.

There is growing evidence that SCH is associated with lipid abnormalities, increasing cardiovascular risk, particularly in older women (4, 5). Clinical hypothyroidism is associated with premature atherosclerosis and increased prevalence of coronary disease. This is at least partly due to the lipid abnormalities often found in hypothyroidism (6,7). Possible mechanisms behind the link between hypothyroidism and atherosclerosis, other than dyslipidemia, include the effects of thyroid hormones on coagulation, vasodilatation, parasympathetic function and homocysteine metabolism (4, 8).

A study, which examined the relation between cardiovascular disease and TSH levels in euthyroid patients, found significantly

higher TSH in patients with coronary events compared to controls matched for age, gender and body mass index (9).

Several observational studies comparing the outcome of SCH individuals with euthyroid subjects have shown divergent results, and it has been debated for some time whether SCH is independently associated with ischemic heart disease (IHD). If the latter were true, this would be an important public health issue for the aging population, in which SCH is most prevalent.

As findings of several studies support the influence of SCH on ischeamic heart disease, we tried to investigate prevalence of SCH in acute coronary syndrome patients.

AIM OF WORK

1. To study the prevalence of subclinical hypothyroidism among patients with acute coronary syndrome.

2. To assess the association between subclinical hypothyroidism and in-hospital morbidity and mortality among patients with ACS.

THYROID HORMONE AND THE HEART

Thyroid hormone has many effects on the heart and vascular system (10). Many of the clinical manifestations of hyperthyroidism are due to the ability of thyroid hormone to alter cardiovascular hemodynamics(11). The hemodynamic effects of hypothyroidism are opposite to those of hyperthyroidism, although the clinical manifestations are less obvious. This review will integrate what is known about the mechanisms of thyroid hormone action on the heart(11, 12) with recent observations from both experimental and clinical studies of hyperthyroidism and hypothyroidism. We will also address the potential role of thyroid hormone treatment in patients with acute or chronic cardiac disease.

Effects of Thyroid Hormone on Myocardial Contractility and Hemodynamics

The effects of triiodothyronine, the active cellular form of thyroid hormone, on cardiovascular physiology are shown in Figure (1).

Effects of Thyroid Hormone on Cardiovascular Hemodynamics and the effects of hyperthyroidism and hypothyroidism on various hemodynamic measures are listed in Table (1).