Prevalence of Obstructive Coronary Artery Disease in Patients With Diabetes Mellitus with and without Hypothyroidism

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Abstract: *Background*: The prevalence of obstructive coronary artery disease (CAD) in patients with diabetes mellitus and hypothyroidism versus a control group of patients with diabetes mellitus without hypothyroidism undergoing coronary angiography needed to be investigated.

Methods: Coronary angiography was performed on 173 patients with diabetes mellitus and hypothyroidism and in a control group of 179 patients with diabetes mellitus without hypothyroidism because of a recent myocardial infarction or unstable angina (48% of both groups) or chest pain with a positive stress test (52% of both groups). Obstructive CAD was diagnosed if there was >50% obstruction of at least 1 major coronary artery.

Results: >50% narrowing of 1 or more major coronary arteries was present in 145 of 173 patients (84%) with diabetes with hypothyroidism and in 132 of 179 patients (74%) with diabetes without hypothyroidism ($p<0.025$). >50% narrowing of 3 major coronary arteries was present in 69 of 173 patients (40%) with diabetes with hypothyroidism and in 39 of 179 patients (22%) with diabetes without hypothyroidism ($p<0.001$).

Conclusions: In conclusion, patients with diabetes mellitus with hypothyroidism have a higher prevalence of obstructive CAD of 1 or more major coronary arteries and of 3 major coronary arteries than patients with diabetes without hypothyroidism.

Keywords: Diabetes mellitus, Hypothyroidism, Coronary artery disease.

INTRODUCTION

Patients with diabetes mellitus [1-4] and patients with hypothyroidism [5-8] have a high prevalence of coronary artery disease (CAD). The prevalence of obstructive CAD was increased in 10 patients with diabetes mellitus with hypothyroidism [9]. The prevalence of obstructive CAD documented by coronary angiography needed to be investigated in a large number of patients with diabetes mellitus with and without hypothyroidism. This article reports data from such a study.

METHODS

Coronary angiography was performed on 173 patients with type 2 diabetes mellitus with hypothyroidism because of a recent myocardial infarction, unstable angina pectoris, or chest pain with a positive stress test (Table **1**) and in a control group of 179 patients with type 2 diabetes mellitus without hypothyroidism because of the same indications (Table **1**). Obstructive CAD was diagnosed if there was >50% obstruction of at least 1 major coronary artery [10-12].

Table 1. Prevalence of Indications for Coronary Angiography in Patients with Diabetes Mellitus with and without Hypothyroidism

Indication	Diabetes with Hypothyroidism (n= 173)	Diabetes without Hypothyroidism (n=179)
Recent myocardial infarction or unstable angina	83 (48%)	86 (48%)
Chest pain with positive stress test	90 (52%)	93 (52%)

No significant differences are present.

Diabetes mellitus was diagnosed according to American Diabetes Association criteria [13].

Student's t tests were used to analyze continuous variables. Chi-square tests were used to analyze dichotomous variables.

RESULTS

Table **2** shows the baseline characteristics of the patients with diabetes mellitus with hypothyroidism and of the patients with diabetes mellitus without hypothyroidism. Table **2** also lists the level of statistical significance.

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Table 2. Baseline Characteristics of Patients with Diabetes Mellitus with and without Hypothyroidism

Variable	Diabetes with Hypothyroidism (n=173)	Diabetes without Hypothyroidism (n=179)	pValue
Age (years)	68 ± 11	66 ± 12	<0.05
Men	58 (34%)	79 (44%)	<0.05
Women	115 (66%)	100 (56%)	<0.05
Whites	117 (68%)	120 (67%)	NS
Nonwhites	56 (32%)	59 (33%)	NS
Smoking	26 (15%)	32 (18%)	NS
Hypertension	153 (88%)	161 (90%)	NS
Dyslipidemia	139 (80%)	145 (81%)	NS
Body mass index ≥ 30 kg/m^2	81 (47%)	88 (49%)	NS

Hypertension is a blood pressure of 130/80 mm Hg or higher.
Dyslipidemia is on lipid-lowering drug therapy or a serum total cholesterol of ≥ 200 mg/dl, a serum low-density lipoprotein cholesterol of ≥ 100 mg/dl, a serum high-density lipoprotein cholesterol of <40 mg/dl, or serum triglycerides ≥ 150 mg/dl.

Table 3. Prevalence of >50% Narrowing of 1 Major Coronary Artery and of 3 Major Coronary Arteries in Patients with Diabetes Mellitus with and without Hypothyroidism

Variable	Diabetes with Hypothyroidism (n=173)	Diabetes without Hypothyroidism (n=179)	p Value
>50% narrowing of 1 or more major coronary arteries	145 (84%)	132 (74%)	<0.025
>50% narrowing of 3 major coronary arteries	69 (40%)	39 (22%)	<0.001

Table **3** shows the prevalence of >50% narrowing of at least 1 major coronary artery and of >50% narrowing of 3 major coronary arteries, in the 173 patients with diabetes mellitus with hypothyroidism and in the 179 patients with diabetes mellitus without hypothyroidism. Table **3** also lists levels of statistical significance.

DISCUSSION

Patients with diabetes mellitus [1-4] and patients with hypothyroidism [5-8] have a high prevalence of CAD. The prevalence of obstructive CAD was increased in 10 patients with diabetes mellitus with hypothyroidism [9].

Data from the present study showed that obstructive CAD with >50% narrowing of at least 1 major coronary artery was present in 145 of 173 patients (84%) with diabetes mellitus and hypothyroidism and in 132 of 179 patients (74%) with diabetes mellitus without hypothyroidism ($p<0.025$). Data from the present study also showed that obstructive CAD with >50% narrowing of 3 major coronary arteries was present in 69 of 173 patients (40%) with diabetes mellitus and hypothyroidism and in 39 of 179 patients (22%) with diabetes mellitus without hypothyroidism ($p<0.001$).

These findings were observed despite a similar prevalence of smoking, hypertension, dyslipidemia, and obesity in both groups. To the best of our knowledge, there are no other studies reporting the prevalence of obstructive CAD in patients with diabetes mellitus with hypothyroidism. Further research needs to be performed to investigate what biochemical/molecular events may underpin the separation of these 2 patient populations (that is, the additional hypothyroidism).

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