

Original article:

Study of impact of subclinical hypothyroidism on results of coronary bypass surgery

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Abstract

Background: Subclinical hypothyroidism (SCH) is characterized by an elevated thyroid-stimulating hormone and normal free thyroxine. This study aimed to evaluate the influence of SCH on the recovery of patients after coronary artery bypass grafting (CABG).

Methods: In this study, we selected patients who underwent CABG were identified. The postoperative outcomes were compared. We retrospectively reviewed and compared all-cause mortality, cardiovascular mortality, and cardiovascular events in 100 patients who underwent CABG.

Results: The incidence of all-cause mortality after CABG was significantly higher in patients with SCH (55%) than in euthyroid patients (32%), with a hazard ratio of 1.70 (95% confidence interval, 1.10 to 2.63; P=0.018) after adjustment for age, sex, current smoking status, body mass index, underlying diseases, left ventricular dysfunction, and emergency operation.

Conclusions: SCH or low total T3 might be associated with a poor prognosis after CABG, implying that preoperative thyroid hormonal status may be important in ischemic heart disease patients.

Keywords: coronary artery bypass grafting; subclinical hypothyroidism, Goitre

Introduction:

Subclinical hypothyroidism (SCH), defined as high levels of serum thyroid-stimulating hormone (TSH) and normal free levels of thyroxine (fT4), is a very common condition, especially in iodine-rich areas [1,2]. Therefore, concerns have been raised regarding the health effects of SCH, and many studies have shown an association between SCH and clinical side effects, particularly the increased risk of heart disease or death [3 - 6]. However, some inconsistent results have been reported, showing no correlation between TSH levels and cardiovascular effects [3,7,8]. Despite these differences, meta-analyzes showed a slight increase in the risk of cardiovascular disease (CHD) and mortality in SCH subjects, especially among subjects with high TSH levels. Recently, we also demonstrated a clear correlation between high TSH levels and cardiovascular risk among people at high risk for cardiovascular risk in both human-based prospective studies and meta-analyzes. (9,10,11)

Methodology

This study was conducted in our department. The sample size was estimated with help of expert. In this study, we selected patients who received CABG and were identified. Postoperative results were compared. We have repeatedly reviewed and compared the underlying cause of death, cardiac death, and cardiac events in the 100 patients who received CABG.

We have confirmed the underlying diseases of patients, including high blood pressure, dyslipidemia, diabetes, brain disease, and current smoking through their medical records.

We excluded the patients with improper record, follow up with us.

Results:

Table 1) Gender wise distribution

S.NO.	Gender	Number of cases
1	Male	72
2	Female	28

Table 2) Age wise distribution

S.NO.	Age range (Years)	Number of cases
1	20 -40	8
2	41-60	52
3	More than 60	42

The mean age of the patients was 65.9 ± 9.9 and the proportion of male patients was also high (72%). In addition, CABG patients showed a higher frequency of cardiovascular risk factors, including higher BMI and lower risk factors such as high blood pressure, diabetes, dyslipidemia and chronic kidney disease. Cases of all-cause mortality after CABG were significantly higher in patients with SCH (55%) than euthyroid patients (32%), with a risk factor of 1.70 (95% confidence interval, 1.10 to 2.63; $P = 0.018$) after correction age, gender, current smoking status, weight index, lower extremities, left ventricular dysfunction, and emergency functioning.

Discussion:

In our study, the mean age of patients was 65.9 ± 9.9 and the proportion of male patients was also higher (72%). In addition, CABG patients showed a higher frequency of cardiovascular risk factors, including higher BMI and lower risk factors such as high blood pressure, diabetes, dyslipidemia and chronic kidney disease. Cases of all-cause mortality after CABG were significantly higher in patients with SCH (55%) than euthyroid patients (32%), with a risk factor of 1.70 (95% confidence interval, 1.10 to 2.63; $P = 0.018$) after correction age, gender, current smoking status, weight index, lower extremities, left ventricular dysfunction, and emergency functioning.

Other results provide support for the possibility that SCH is a risk factor for CHD. Rodondi et al. [12] reported that SCH was associated with an increased risk of CHD in their meta-analysis. They also showed a significant positive correlation between TSH elevation and increased mortality from CHD in another meta-analysis of 55,287 adults, particularly those with a TSH concentration of 10 mIU / L or higher [12]. Similarly, elevated serum TSH levels significantly increase the risk of CHD by approximately 20% with one common deviation in men in the Korean follow-up group for 10 years [13].

We have previously shown that SCH is associated with postoperative Afib within 3 months after CABG [14], and that postoperative Afib in SCH patients after CABG was associated with an increased risk of postoperative side effects, especially coronary revascularization [15]. Although this mechanism is unclear, TSH itself has been elevated to promote the proliferation of smooth muscle cells, endothelial cell damage, and inflammation, leading to atherosclerosis [16, 17]. Patients with SCH also showed elevated levels of inflammatory cytokines, lymphocytes, macrophages, and nitrotyrosine, indicating endothelial dysfunction, but collagen content decreased in vascular plaques [11]. In this regard, previous research has suggested that patients with SCH are at risk of developing atherogenesis, which may lead to restlessness. Importantly, we found that CABG patients with SCH were at greater risk of death and cardiovascular disease during follow-up. The association between mortality and SCH in CABG patients was not observed in our previous studies (11-16)

Conclusions:

Low SCH or low T3 may be associated with severe prognosis after CABG, which means that preoperative hormonal status may be important in ischemic heart patients.

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