

Case Study on Thyroid Profile in Coronary Artery Disease Patients



Medical Science

KEYWORDS : CAD, subclinical hypothyroidism, Thyroid Profile, Myocardial Infarction

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ABSTRACT

Introduction: Abnormalities in thyroid function has been found in Coronary Artery Disease patients. Hypothyroidism may be considered a predictor of cardiovascular diseases.

Aim: Study on the prevalence of hypothyroidism in patients with Coronary Artery Disease manifestations.

Materials and Methods: Prospective observational study, 45 fasting blood samples were collected from Coronary Artery Disease patient and analyzed.

Results: Of the 45 samples collected for testing, 86.67% showed euthyroid status, 4.44% showed subclinical hypothyroid status, 4.44% showed hypothyroid status and 2.22% showed subclinical hyperthyroidism.

Conclusion: Thyroid Function Test results were found to be abnormal in few patients. Thyroid dysfunction does not seem to contribute to the risk of development of acute Myocardial Infarction in patients with Coronary Artery Disease.

Introduction:

Triiodothyronine (T₃), the biologically active form of thyroid hormone derived predominantly from the peripheral conversion of the precursor thyroxine (T₄), exerts a wide range of functions in several organs, including the heart¹. Hypertension and Hypercholesteremia with subclinical hypothyroidism shown association with cardiovascular diseases². Risk of developing coronary artery disease is potentially influenced by the increase in thyroid antibodies³. Subclinical hypothyroidism and its impact on cardiovascular outcomes that will drive most clinical management decisions, as well as cost-effectiveness considerations for its detection and treatment⁴. Hak et al have shown earlier that subclinical hypothyroidism doubles the risk of MI, especially in females⁵. In hypothyroidism, heart muscle is weakened in both its contraction and relaxation phase. This means that the heart cannot pump as vigorously as it should, and the amount of blood it ejects with each heart beat is reduced. Sometimes the diastolic dysfunction, a potentially serious condition may result⁶. Increased mortality among patients with low T₃ syndrome has also been observed in acute myocardial infarction, a common precursor of chronic heart failure of ischemic origin⁷.

Aim:

Aim of this study to establish the prevalence of thyroid dysfunction in patients with manifestations of coronary artery disease.

Materials and Methods:

Prospective observational study was done in Department of Medicine, Tirunelveli Medical College Hospital. Institutional ethics committee approval and informed consent from patients were obtained. Patients with signs and symptoms suggestive of coronary artery disease were included in the study. Blood samples were collected from patients after 8 to 12 hours of fasting. TSH, T₃ and T₄, Total cholesterol level examined.

Results:

Out of 45 samples collected, 36 (80%) were of males and

9 (20%) were of females. Out of the 36 males 16 (44.44%) were aged above 60, 15 (41.67%) were in the age group of 41 to 60 years and 5 (13.89%) were in the age group of 21 to 40 years. Out of 9 females 5 (55.56%) were aged above 60, 3 (33.33%) were in the age group of 41 to 60 years and 1 (11.1%) was in the age group of 21 to 40 years. Out of the 45 samples, subclinical hypothyroidism was found in 2 samples (4.44%), out of which 1 (50%) was a case of treated MI and 1 (50%) was a case of CAHD. 2 samples were found to have hypothyroidism (4.44%), of which both were acute MI patients. 1 sample showed subclinical hyperthyroidism (2.22%), which was an acute MI patient. The remaining 39 samples were found to have euthyroid status (86.67%). The study revealed equal prevalence of these conditions in both males and females. Out of 9 samples with high T₄, 2 (22.22%) were having cholesterol above 250mg/dL, 3 (33.33%) were having cholesterol in the range of 201-250mg/dL and 4 (44.44%) were having cholesterol in the range of 151-200mg/dL. Out of 5 samples showing low T₄, 2 (40%) were having cholesterol in the range of 100-150mg/dL, 1 (20%) were in the range of 151-200mg/dL, 1 (20%) were in the range of 201-250mg/dL and 1(20%) were found to have cholesterol above 250mg/dL. Out of 5 samples showing high TSH, 2 (40%) have cholesterol above 250mg/dL, 1 (20%) were in the range of 201-250mg/dL and 2 (40%) were in the range of 151-200mg/dL. Out of 5 samples with low TSH, 3 (60%) were in the range of 151-200mg/dL and 2 (40%) were in the range of 100-150mg/dL. The maximum number of abnormal thyroid function tests is seen in those having cholesterol in the range of 151-200mg/dL, followed by those in the range of 201-250 and above 250mg/dL⁵.

Discussion:

In this study involving 45 samples, 13.33% were found to have abnormalities in thyroid function. Hypothyroidism has been generally considered as cardiovascular risk factor in majority of studies, mainly because of its association with elevated serum total and LDL-cholesterol⁸. Hypercholesterolemia in hypothyroidism results from reduced catabolism of lipoproteins, a phenomenon that may be explained by the decreased expression of lipoprotein receptors⁹. Overt

hypothyroidism: Results from failure of thyroid to synthesise and secrete adequate T4, despite of adequate TSH stimulation¹⁰. As a result, there will be elevated TSH levels and decreased T4 levels. Out of 45 samples, 2 samples gave similar result. Subclinical hypothyroidism: Is characterised by a mildly elevated TSH level with a normal T4 concentration and either no or mild non-specific symptoms. Out of 45 samples, 2 samples gave similar result. Subclinical hyperthyroidism: Characterised by low TSH levels, normal T4 and T3 and the absence of thyrotoxicosis, although patients may have subtle symptoms of hyperthyroidism. Out of 45 samples 1 sample gave similar result. Hyperthyroidism: Characterised by decreased TSH level and elevated T3 and T4 levels. None of the samples gave similar result.

Conclusion

The hypothyroidism could be understood as just a biological risk factor of CAD and not as a direct factor. Further prospective studies on a larger number of patients are warranted to confirm the association between the thyroid function and CAD. Mild forms of thyroid disease and even variations of thyroid hormone within the physiological range have been linked to adverse cardiovascular prognosis; hence thyroid hormones should be examined as continuous variable.

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