Association Between Glycated Hemoglobin and Elevated Thyroid Hormones Levels in Patients with Type 2 Diabetes Mellitus

Salah Eldin Omar Hussein
Medical Laboratory Sciences Department, College of Health Sciences, Gulf Medical University, Ajman, UAE

Abstract

Introduction and Objective: Hyperthyroidism is more common in patients with type 2 diabetes mellitus (T2DM) than in those without diabetes. This study aimed to determine the association between the serum glycated hemoglobin (HbA1c) and thyroid hormonal profile (FT3, FT4, TSH) in Type 2 diabetic patients.

Methodology: A cross-sectional and case control study examined HbA1c, FT3, FT4 and TSH in 189 Type 2 diabetic patients with good and poor glycemic status.

Results: This study was conducted on 97 Type 2 diabetic patients with poor glycemic status compared to 92 good glycemic status patients. The age range of participants is between 21 to 72 years and the duration of the disease is between (4 – 15) years. P. value of FBG ($p = 0.001$), HbA1c ($p = 0.016$), TSH ($p = 0.009$), FT3 ($p = 0.048$), and FT4 ($p = 0.038$) results among Type 2 diabetic patients revealed significant differences between the means of good and poor glycemic state (P. value < 0.05). Significant moderate a negative correlation was observed between TSH and FBG ($R = -0.34$, $p = 0.001$), HbA1c ($R = -0.27$, $p = 0.02$), and diabetes duration ($R = -0.21$, $p = 0.036$), The scatter matrix plot showed strong a positive correlation between FT3 and FBG ($R = 0.54$, $p = 0.03$), HbA1c ($R = 0.36$, $p = 0.004$), and the diabetes duration ($R = 0.41$, $p = 0.05$), FT4 was also strong positively correlated with FBG ($R = 0.46$, $p = 0.029$), HbA1c ($R = 0.33$, $p = 0.028$), and the diabetes duration ($R = 0.39$, $p = 0.048$).

Conclusion: Concluded from this study, well-controlled Type 2 Diabetes reduced the risk of hyperthyroidism, relatively high HbA1c and low TSH levels may increase the risk of hyperthyroidism.

Keywords

Type 2 diabetes, lower risk, hyperthyroidism, HbA1c.