



The relationship between T3, T4, TSH, and Vitamin D3 in obese women from a small population in Basrah City

Eman H. Rahi ⁽¹⁾, Zahraa Mahmoud Hussain Al-Hejjaj ^{(2)*}, Duha T. Al-Tale ⁽³⁾, Zainab Alaa Abdulateef Almusawi ⁽⁴⁾

^{(1), (2), (3)} Department of Fundamental Science, College of Nursing, University of Basrah, Basrah, Iraq.

⁽⁴⁾ Directorate of Education Maysan, Ministry of Education, Iraq.

* Corresponding author: zahraa.hussain@uobasrah.edu.iq

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ABSTRACT

Background: Obesity is a state characterized by excessive deposition of fat. Thyroid hormones are known to influence body weight, and thyroid diseases, which are linked to vitamin D deficiency as risk factors. **Material and methods:** A total of 35 samples aged from 25 – 50 years were collected during the period from November 2022 to January 2023. The subjects were divided into two major groups depending on their BMI. The anthropometric measurements including height, body weight, waist and hip circumferences, were measured for all participants. **Results:** the results showed that there was a significant decrease in the level of T3 in obese women compared with lean women ($p=0.042$). On the other hand, no significant differences were observed in T4, TSH, and D levels between the two groups. Furthermore, there was a positive correlation between vitamin D and T3 in the obese group ($r=0.587$, $p=0.046$) and there was no correlation between vitamin D and other hormones (T4, TSH).

Conclusion: Vitamin D was decreased in the study population regardless the weight moreover, there was a decrease in the level of T3 in obese women compared to thin women, furthermore, the study showed a slight increase in TSH concentration in the two groups and simple decrease of T4 level in obese women but it is still with normal range. These conclusions may be an indicator of subclinical hypothyroidism.

Keywords: Obesity, Subclinical hypothyroidism, Vitamin D, Thyroid hormones.

INTRODUCTION

Obesity is a condition described by abnormal accumulation of adipose fat, and it commonly results in the development of various related disorders. Globally, the prevalence of obesity is rising and is now considered an epidemic by the World Health Organization (1,2). Thyroid hormones are recognized to regulate basic metabolism and thermogenesis, as well as lipid and glucose metabolism, food intake, and lipid oxidation. Thus, it influences on body composition (3,4). Strong associations are found between obesity, weight

maintenance, and thyroid hormones, and many mechanisms appear to be involved in it (5).

Vitamin D, a steroid hormone, is important in bone mineral homeostasis, growth, and maintenance of skeletal health. Diabetes mellitus, malignancies, multiple sclerosis, atherosclerosis, infectious diseases, and various autoimmune disorders, including thyroid autoimmune diseases, have all been linked to vitamin D deficiency as risk factors (6-8). This vitamin exerts its biological effects through nuclear vitamin D receptors (VDR) which are present in most human cells and tissues. Therefore, vitamin D functions by controlling the

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