



**RESEARCH ARTICLE**

**Evaluation of the correlation between the hormone adiponectin and vitamin D3 in obese women**

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**ABSTRACT**

The research included a study of the relationship between the hormone adiponectin and vitamin D3 in obese female patients. The results we obtained showed that the level of the concentration of the hormone adiponectin shows a high significant decrease in the blood serum of obese patients compared to a control sample of healthy women. The results also showed that the level of vitamin D3 concentration shows a significant decrease It was high in the serum of obese patients compared with control samples. **Keywords:** Delayed Cord Clamping, Neonatal Outcomes. Hematocrit, Hemoglobin, Total Serum Bilirubin, and hematological parameters.

**Keyword :** The hormone adiponectin, and vitamin D3, obese women



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### INTRODUCTION

Adiponectin, a pleiotropic cytokine, normally circulates in blood plasma at high concentrations (5–30 µg/ml) [1], [2] and is typically found at levels 35% lower in men than in women. However, adiponectin concentrations are lower in women under certain conditions. Cnop and colleagues [3] found that postmenopausal women showed significantly higher adiponectin levels compared with premenopausal women, while Nishizawa and Colleagues [4] found no significant differences. Data on adiponectin concentrations in obese women are more robust, where adiponectin concentrations in adipose tissue and the circulation have consistently been found to be abnormally low [5]. Similarly, low adiponectin levels have also been found in women with endometriosis [6]. Adiponectin levels have been shown to increase with weight loss [7]. Thus, adiponectin is strongly associated with obesity and is a potentially important hormone in the link between obesity and women's cancers. This review highlights the molecular role of adiponectin and its association with obesity in female-related carcinogenesis. Vitamin D<sub>3</sub> is obtained from the diet or through synthesis in the skin with the participation of ultraviolet B radiation (UVB). Next, it is metabolized to its active form, 1,25-dihydroxyvitamin D, with the aid of enzymes. There are two forms of vitamin D: vitamin D<sub>2</sub> (ergocalciferol), which is found in plants and fungi, and vitamin D<sub>3</sub> (cholecalciferol), which is produced by animals. In humans, solar radiation converts provitamin D<sub>3</sub> into previtamin D<sub>3</sub>, which is then spontaneously heat-isomerized to vitamin D<sub>3</sub> [8]. The main circulating metabolite of vitamin D is vitamin 25(OH)D, which accurately reflects the amount of vitamin D in the body, whether it originated from food or was synthesized in the skin. According to many authors, vitamin D deficiency is a worldwide phenomenon that may affect as many as 30–50% of the adult population [9]. Those especially prone to vitamin D deficiency are elderly people, due to their decreased ability to synthesize this vitamin in the skin [10]. Until recently, vitamin 25(OH)D was regarded as a factor regulating calcium phosphate and bone tissue metabolism. Reports from recent years have confirmed that it is involved in maintaining homeostasis in many

tissues [11], and its deficiency is associated with musculoskeletal and cardiovascular disorders, as well as autoimmune, dermatological, and cancer diseases [12, 13]. Furthermore, serum vitamin D levels appear to be related to obesity in both healthy and ill individuals [14]. The reduced bioavailability of vitamin D is observed in overweight and obese individuals, which probably results from the increased sequestration of this vitamin in adipose tissue [15]. Vitamin D deficiency is closely related to visceral obesity [16],

### MATERIALS AND METHODS

In the research, 30 samples of blood serum of healthy, non-obese women were used in a control group. Also, 60 samples of blood serum of obese women were collected. Devices manufactured by reputable international companies were used. The research was conducted in cooperation with Mosul Hospital and a number of analysis laboratories.

#### Serum preparation

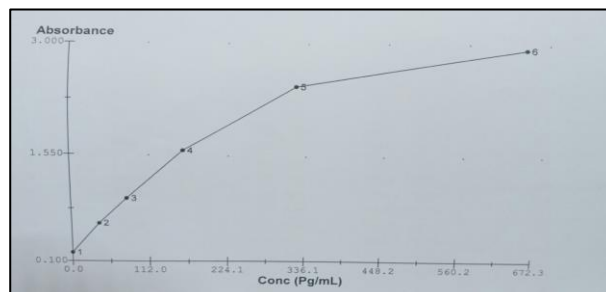
Samples were collected by drawing (10 ml) of blood samples from each group using a syringe then placed the blood in (6 ml) plastic tubes containing a tube gel afterwards The serum was separated from the blood using a centrifuge at 4000 x g for 15 minutes Immediately after separating the blood, part of the serum was placed in a plastic pendroof tube. The plastic tube (bendroof) in which the serum was placed was kept at a temperature-20 C (temperature o) to measure the concentration of the hormone adiponectin, clothoprotein, 3D, calcium, glucose,Leptin, glutathione, cholesterol, insulin, and lipoprofile.

Measurement of the level of clothoprotein concentration in blood serum:

Basic Principle: The concentration of clothoprotein was estimated using a ready-made measurement kit (Kit) prepared by the Chinese BioassayTechnology Laboratory Company, and this kit is an enzyme-linked immunosorbent assay (ELISA). The plate was pre-coated with an antibody to human Klotho protein, then Klotho protein present in the sample was added and bound to the antibody coated on the pits. A biotinylated human Klotho protein antibody was

then added and bound to the Klotho protein in the sample. Then Streptavidin-HRP was added and bound to the Biotinylated Klotho protein antibody. After incubation, the washing is done by 5 times, then the substrate solution is added and the color develops. The intensity of the color is proportional to the concentration of Klotho

protein present in the sample. The reaction ends with the addition of the acid stop solution. The absorption is measured at 450 nm. Figure (1) shows the standard curve of klothroprotein and shows the relationship between absorbance and concentration



Estimation of the concentration of vitamin D3 in the blood serum

The vitamin D3 in the sample and the antibody in reagent 1 become immune complexes. And that the antigen acts as a conjugation template for the DNA in reagent 2 and binds to the antibodies, and this analysis is linked to fluorescent dyes, which are proportional to the intensity of the attachment of the samples to the standard concentration of vitamin D3 that contains all the reactive reagents in the cuvette.

Calculations

Construct a standard curve by plotting the mean O.D of each ABS standard (Y) versus

concentration (X) and plotting the best fit curve through the points on the graph.

Results and discussion

Measurement of the concentration of the hormone adiponectin in the blood serum:

The values of the mean  $\pm$  standard deviation of adiponectin in a number of samples of obese patients were  $(1.29 \pm 6.26)$  mg / L, while the mean  $\pm$  standard deviation in the control group (healthy) was  $(14.8 \pm 2.8)$  mg / L. The results obtained indicate that the level of adiponectin concentration shows a high significant decrease at the level of probability ( $P \leq 0.01$ ) in the sera of obese patients compared to the control group. As shown in Figure (2)

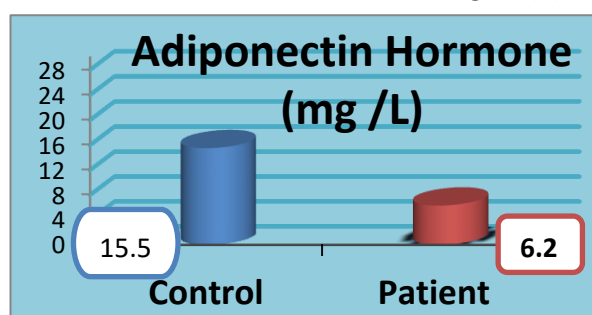


Figure (2) Mean  $\pm$  standard deviation of adiponectin in study samples

The results of our study are consistent with the study of (Arita et al., (1999)) regarding patients, as they found that obese patients had low levels in the blood circulation of adiponectin [17],and preclinical studies showed that adiponectin has an anti-inflammatory function in Lung cells (Garcia & Sood (2012)) It is a vasodilator and reduce the inflammatory mechanism [18].

A recent cohort study showed that higher concentrations of Adiponectin in the serum are associated with cancer and cancer-related deaths, which means that the paradox of Adiponectin contributes to the risk of cancer during aging [19],and that adiponectin is closely related to obesity, but a decrease in plasma adiponectin is a cause of increased obesity. The

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decrease in adiponectin for patients does not appear to be a predictor of future body weight gain. [20],

Estimation of vitamin D3 concentration in blood serum:

standard deviation of the control group.

(62.30 ± 10.2) ng / ml and when performing the statistical analysis, it was found that there was a significant difference in obese patients compared obese patients compared to the control group.. As shown in Figure (3)

The results we obtained show the mean ± standard deviation of obese patients, (2.68 ± 14.29) ng / ml and the mean ±

to the control group The results indicate that the level of vitamin D3 concentration shows a high significant decrease at the probability level (P ≤ 0.01) in the sera of

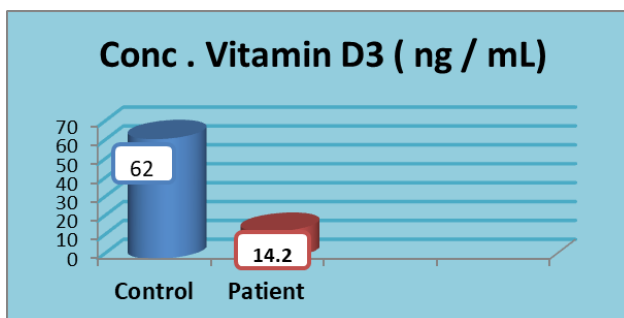


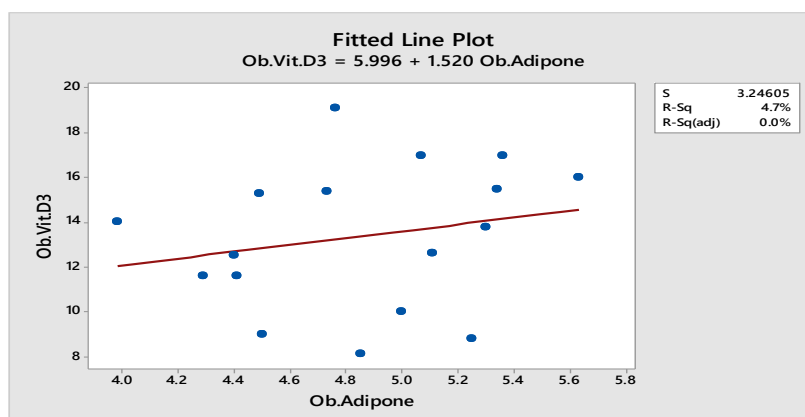
Figure (3) mean ± standard deviation of vitamin D3 in the study samples

The results of our study showed that there was a significant decrease in the level of vitamin D3 concentration in obese patients compared with the control group. A study (Bergman P et al (2012)) stated that vitamin D3 supplementation may reduce infectious symptoms among patients with antibody deficiency or recurrent respiratory tract infections [21]. Hossein-Nezhad et al stated that vitamin D deficiency D3 leads to a higher incidence of autoimmune and cardiovascular diseases and cancer [22]. The synthesis of vitamin D3 in human skin is one of the factors that determines the amount of cholecalciferol available to healthy individuals. Many factors, including air pollution, lifestyle, use of The sun filters, and doses the ultraviolet rays thrown onto

the makeup[23].

Evaluation of the correlation between the hormone adiponectin and D3 in the PATIENTS group and the CONTROL group

The results showed that the relationship (positive linear correlation) between the level of the hormone adiponectin and D3 in obese female patients was the value of the correlation coefficient (r = 0.126) as in Figure (4). The results also showed that the relationship (negative linear correlation) between the level of the hormone adiponectin and D3 in healthy people has a correlation coefficient value (r = - 0.027), as in Figure (5).



Correlation between  
D3 in obese patients

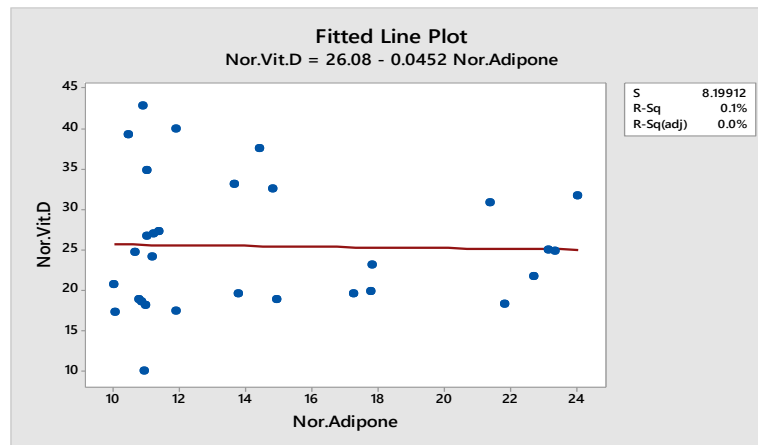


Figure (4).  
adiponectin and

Figure (5) The correlation between the hormone adiponectin and D3 in healthy subjects

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