

## ARTICLE / INVESTIGACIÓN

## Measuring levels of hormones in osteoporosis Iraqi women patients

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**Abstract:** This study was conducted to investigate the effect of the hormone progesterone and testosterone on osteoporosis in women, and it was found that there are statistically significant differences between the hormone progesterone and there are no statistically significant differences for the hormone testosterone. The ELISA method measured the testosterone concentration in the blood and the progesterone concentration. The purpose of the study measuring the levels of some hormones in osteoporosis Iraqi women patients. Fifty (50) women patients with osteoporosis were admitting Baghdad Teaching Hospital with osteoporosis and 40 healthy populations, and it was conducted in Baghdad Teaching Hospital/ Bone density examination unit/ in Baghdad-Iraq. Endocrine testing Estrogen content was measured following the manufacturer's instructions using available human Uno ELISA kits (Immunolab GmbH, Kassel, Germany). Results showed a significant difference (P-value of 0.0038) in progesterone between the two study groups. The mean of patient groups was mean±SD (6.759 ± 6.705), and control groups were mean±SD (11.03 ± 6.546). The main risk factor for osteoporosis is the presence of more progesterone when comparing patients with healthy women. As for testosterone, there are no significant differences; that is, it does not affect women.

**Key words:** ELISA Technique, progesterone, testosterone.

## Introduction

Primary osteoporosis is caused by loss of bone and a disturbance of bone architecture, resulting in skeletal weakness and increasing fracturing risk<sup>1</sup>. Vertebral, hip, and other fragility fractures in women, which are linked to fractures in old age, originate in the pre-and peri-menopausal age, when a range of variables influencing bone mineral metabolism are present<sup>2</sup>. Anti characteristics such as female species, elderly aging, tiny thin build, ethnicity, and a family history of cracks are among them. Vitamin D insufficiency, inactivity, alcoholism, excess drinking, & caffeine are all key variable drivers<sup>3</sup>. Quasi and new therapies are used to protect and cure osteo. Diet, regular weight-bearing activities, and the cessation of smoking and alcohol intake are five semi-therapeutic factors that have been well documented. The World Health Organization's (WHO) concept of fractures is as follows<sup>4</sup>. The criteria provide the clinician with an accurate benchmark to definitively diagnose and make subsequent treatment strategies for the younger typical sample population (table 1)<sup>5</sup>. Moreover, the disease is known as a

"motionless disease," so it progresses commences; causes severe pain, lower quality of life, lost workdays, and disability; and approximately 20% of women who have a hip fracture will drop dead within a week as an indirect result of both the fracture.

Testosterone is one of a man's major hormones. We also know that this hormone level tends to decline. The necessity of monitoring testosterone levels in adult males is a lesser-known truth. They will indeed be able to intervene in the aging process in this way. The above are a few truths about testosterone and how to replace it if it is low. I'll also talk about how the medical profession deals with this. Some people are scared of hrt<sup>6</sup> steroid.

On the other hand, drugs and estrogen act in tandem in every female tissue. Fractures decrease when testosterone production falls. Inflammatory mediators produce postpartum reduced BMD, which leads to more significant demineralization in women<sup>7</sup>.

Normal	BMD within 1 SD of the young adult reference range
Osteopenia	BMD is more than 1 SD below the young adult's mean but less than 2.5 SD of this value.
Osteoporosis	BMD 2.5 SD or more below the young adult mean.

**Table 1.** The definition of osteo by the Health Organisation (WHO).

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## Materials and methods

### Patients Group

Fifty (50) women patients with osteoporosis were admitting Baghdad Teaching Hospital with osteoporosis and 40 healthy populations and it was conducted in Baghdad Teaching Hospital/ Bone density examination unit/ in Baghdad-Iraq in the period between September 2020- January 2021.

### Control Group

It consisted of Forty (40) healthy volunteers. All patients and control groups were from the same ethnic group (Arabic).

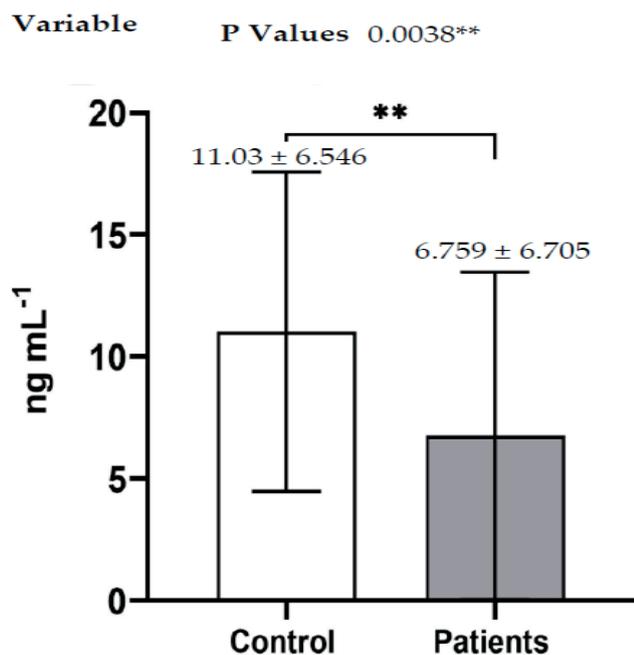
### (ELISA): Enzyme-Linked Immunosorbent Assay (Analysis)

Endocrine testing Estrogen content was measured following the manufacturer's instructions using available human Uno ELISA kits (Immunolab GmbH, Kassel, Germany). A calibration curve of 17-estradiol, estrogen, and hormone (area" levels) was injected in the microwells as we prepared solutions of blood serum. The dissolved enzyme conjugate (peroxidase), substrate (tetramethylbenzidine -TMB), and antibodies were added to the microplate and incubated in the dark for 30 min. Serological washing was used to wash all precedes in stages (ELx50, Bio-Tek Instruments, Germany). The solution was allowed to cool to a stop solution (0.5 M sulfate). The serum hormone concentration was determined by drawing the calibration graph<sup>8</sup>.

## Results

### Distribution of Osteoporosis Patients and Control Group According to progesterone

Results of osteoporosis patients (women) and an apparently healthy group were studied according to the



### Progesterone

**Figure 1.** Distribution of Osteoporosis Patients and Control Groups According to progesterone.

progesterone table 2 and figure 2. The results showed a significant difference (P-value of 0.0038) in progesterone between the two study groups. The mean of patient groups was mean±SD (6.759 ± 6.705), and control groups were mean±SD (11.03 ± 6.546)<sup>9,10</sup>.

## Discussion

Results of osteoporosis patients (women), as well as a healthy group, were studied according to the Testosterone table (2) and figure (1). The results showed a non-significant difference (P-value of 0.2785) in testosterone between the two study groups. The mean of patient groups was mean±SD (12.30± 3.677), and control groups were mean±SD (11.40± 4.165)<sup>11,14,15</sup>.

## Conclusions

The main risk factor for osteoporosis is the presence of more progesterone when comparing patients with healthy women. As for testosterone, there are no significant differences; it does not affect women.

### Ethics Approval and Consent to Participate

According to human research's local bioethical principles, anonymized, unidentifiable data from clinical records, excluding case reports, do not require internal review boards' approval. The physicians collecting clinical data were the only health providers accessing patients' clinical records.

### Competing Interests

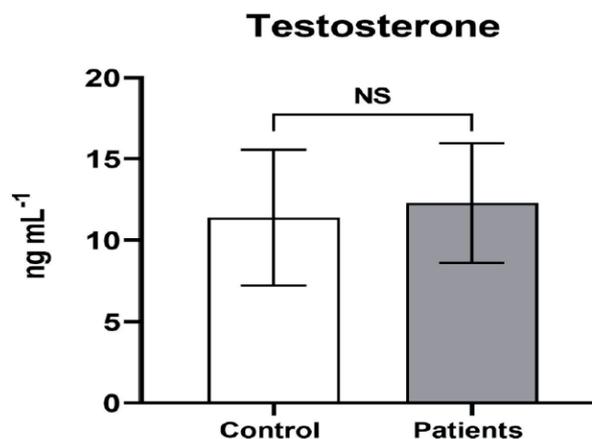
The authors declare no conflicts of interest.

### Funding

This study did not receive any funding.

### Authors' Contributions

ASR conceptualized the study and directed the team when collecting information. He drafted the first version of the manuscript and reviewed the final version. ASR and AKJ collected information from the Iraqi woman unit and contributed equally to the data analysis. ASR was responsible for critically reviewing the first draft, completing the manuscript's final version, and critically reviewing the entire analytical process around data collection.



**Figure 2.** Distribution of Osteoporosis Patients and Control Groups According to testosterone.

Variable	Study Groups		P Values
	Mean $\pm$ SD		
Testosterone	Patients	Control	0.02785
	12.30 $\pm$ 3.677	11.40 $\pm$ 4.165	

SD: standard Deviation, P: Probability, \*\*The difference is significant at (<0.01).

**Table 2.** Distribution of Osteoporosis Patients and Control Groups According to Testosterone.

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