

Gender Differences of Serum Leptin Hormone Levels in Iraqi Population

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ABSTRACT

To evaluate and compare serum Leptin hormone level between Iraqi male & female and the relation between this hormone & BMI in these two groups.

A total of 44 normal male & female subjects were included in this study

{ Group 1 : 22 female } , { Group 2 : 22 male } .

Serum Leptin hormone ,BMI &fasting blood glucose were measured for both groups.

Serum Leptin level in group 1 was $(8.82 \pm 2.9 \mu\text{g/L})$ where as in group 2 it was $(4.65 \pm 3.2 \mu\text{g/L})$. These changes were statistically significant. Fasting blood glucose levels were technically within the normal value $(116.43 \pm 3.4\text{mg/dl})$ for group 1 & $(118.52 \pm 2.9 \text{mg/dl})$ for group 2 . BMI levels were comparable in both groups during the study, with slight elevation in group 1 [$24 \pm 1.73 \text{kg/m}^2$ for group 1 & $23 \pm 1.98 \text{kg/m}^2$ for group 2] which within the acceptable limit as far as safety concern.

Leptin, an adipocyte-derived hormone known to play an important role in body-weight regulation, the result of this study shows that Leptin is presented differentially in Iraqi men and women ; in which it is significantly higher in women than in men serum . These observations are potentially important for the understanding of differences between men and women in regulation of food intake, weight gain, and body fat distribution.The relation between Leptin & the BMI in male and female in this study may open another approach for this hormone to be involved in –fertility & in pubertal development.

الخلاصة

لغرض قياس ومقارنة هرمون اللبتين (Leptin) بين الذكور والإناث في العراق وعلاقة مستوى الهرمون المذكور مع نسبة كتلة الجسم BMI في كلا الجنسين .

شملت الدراسة 44 شخصاً ، تم تقسيمهم إلى مجموعتين : الأولى ضمت 22 أنثى والمجموعة الثانية تضمنت 22 ذكراً . تم قياس مستوى هرمون اللبتين ونسبة كتلة الجسم ومستوى سكر الدم في حالة الصيام لكلا المجموعتين . أظهرت نتائج قياس الهرمون في المجموعة الأولى 8.82 ± 2.9 مايكرو غرام /لتر . في حين كان مستوى الهرمون في المجموعة الثانية 4.65 ± 3.2 مايكرو غرام / لتر ، حيث أن الفرق كان معنوياً بصورة واضحة . وكان مستوى سكر الدم ضمن القيم الطبيعية : 116.43 ± 3.4 ملغرام /100مل للمجموعة الأولى و 118.52 ± 2.9 ملغرام /100مل للمجموعة الثانية . وكانت نسبة كتلة الجسم متقاربة بين المجموعتين مع وجود ارتفاع قليل في المجموعة الأولى (24 ± 1.73 كغم /م² مقابل 23 ± 1.98 كغم / م²) للمجموعة الثانية) وهي ضمن المستويات الطبيعية .

إن اللبتين وهو هرمون مشتق من الخلايا الدهنية ليقيم بتنظيم وزن الجسم . لقد أظهرت نتائج هذه الدراسة أن مستوى هرمون اللبتين يظهر فروقاً واضحة بين الرجال والنساء العراقيين ، حيث أن مستوياته أعلى في النساء مما هو في الرجال . إن هذه الملاحظات مهمة للمساعدة في فهم الفروقات بين الرجال والنساء في تنظيم تقبل الطعام وزيادة الوزن وتوزيع الدهون في الجسم . إن العلاقة بين مستوى الهرمون ونسبة كتلة الجسم في كل من الرجال والنساء في هذه الدراسة قد يمهد لدراسة علاقة مستوى هذا الهرمون مع درجة خصوبة وتطور البلوغ في كلا الجنسين .

❖ **Determination of serum**

Leptin (ELISA):

Enzyme immunoassay (microtiter strips) for the quantitative determination of Leptin in human serum.¹⁰

STATISTICAL ANALYSIS:

Measurement of variables done by using numbers, percentage, means +/- standard deviation. Differences between variables were measured by using ANOVA test when it needed.

RESULT

The studied variables are listed in table 1. Serum leptin hormone levels are presented in table 2 (8.82 + 2.9 µg/L) in group 1 & (4.65 + 3.2 µg/L) in group 2, The variation between the two groups was statistically significant (P < 0.05) . Gender differences between the two groups in serum Leptin shown clearly in Figure 2, while fig 3 shows the difference in serum leptin levels between Iraqi women and the reference values for female subjects.

Table (1) The studied variables are listed

Variables	Group -1- (n=22)female	Group -2- (n=22)male
Age (years)	27.4 ± 4.18	30.56 ± 3.26
BMI (Kg/m ²)	24 ± 1.73	23 ± 1.98
Fasting blood glucose (mg /dl)	116.43 ± 3.4	118.52 ± 2.9

Table (2) Serum leptin hormone levels are presented in table 2

	Group -1- (n=22)female	Group -2- (n=22)male
Leptin hormone (µg/L)	8.82 ± 2.9	4.65 ± 3.2
Reference Value	7.4 ± 3.2	3.9 ± 2.8

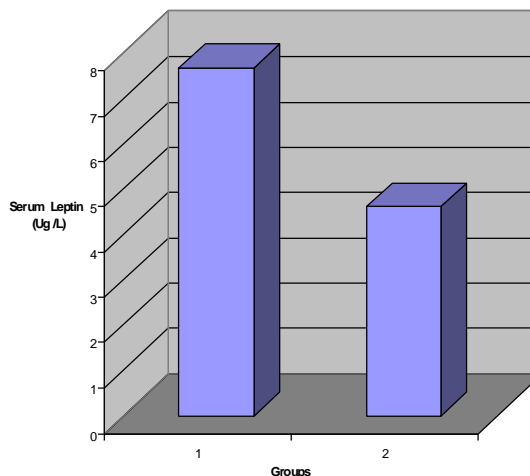


Fig 2: Gender differences in Leptin level between the two groups

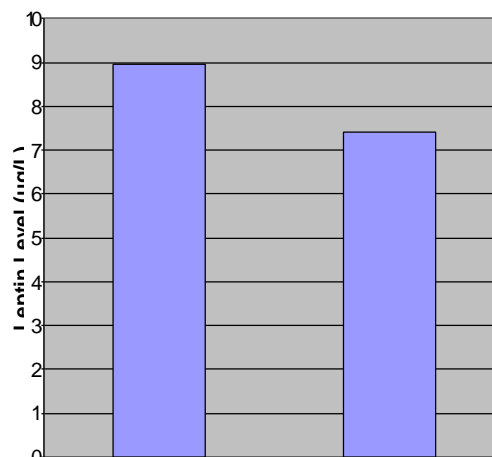


Fig 3 : Comparison between Iraqi (1) and other normal female (2) in Leptin levels

DISCUSSION:

This study is one of the newest studies that discuss the variation in one of the newly discovered hormones (Leptin) between male & female subjects in Iraq. The knowledge of this relation is very important to understand various problems associated with obesity, puberty & infertility⁸.

From the results (table 2 & fig 2) of this study serum Leptin levels are significantly higher in women than in men (p < 0.05) . This study which is done in Iraq to evaluate the values of leptin hormone in normal male & female subjects to be compared with the study of Reitman & coworkers the results shows a higher values in Iraqi female (Mean = 8.82 µg/L) than other female values (mean = 7.4

ug/L)³; These differences may be due to the fact that Iraqi women have higher fat mass than the other women. A comparable results was found in male with different studies.

At first, such differences between Iraqi male & female subjects were thought to reflect the differences in body composition between men and women. Women in general have a higher percentage of fat mass for the same body weight or BMI. Since leptin reflects mainly the amount of body fat, this seemed to be a logical explanation for the observed gender differences¹¹. However, these gender differences and their relationship to body composition were examined, and leptin levels were found to be significantly higher in women with comparable BMI or fat mass.

A second explanation was thought in the differences in fat distribution between men and women. Women generally have more peripheral fat accumulation (especially at the level of the hips), whereas obese men have more abdominal (especially visceral) fat. It was shown in several in vitro studies that subcutaneous adipocytes produce more leptin than fat cells derived from the omental fat depot; this is especially true in women.^{12,13} In vivo studies also showed that leptin levels had a stronger association with peripheral¹⁴ or subcutaneous fat than with intra- abdominal or visceral fat, as measured by computed tomography scan.¹⁵ Thus, the fact that women have more subcutaneous fat, which secretes more leptin, seems an additional reason for the higher leptin levels in women. However, even after correcting for the amount of subcutaneous fat, leptin levels are still found to be significantly higher in women.¹⁰

CONCLUSION

The results of this study are potentially important for the understanding of differences between men and women in regulation of food intake, weight gain, and body fat distribution; but since these differences in body composition between men and women may not be the only reason to explain the differences in leptin levels completely, other factors must play a role, like Steroid hormones but the exact mechanism or interaction is not yet known. These findings seem to indicate that this recently discovered hormone may play a role obesity, infertility & other disease states.

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