# The Study Of Relation Between Some Of Sexual Hormones And Body Mass Index For Infertile Patients

# دراسة العلاقة بين بعض الهرمونات الجنسية ومعامل كتلة الجسم للمرضى المصابين بالعقم

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**الخلاصة :**

**الهدف :** هدفت الدراسة إلى توضيح تأثير معامل كتلة الجسم وعلاقتها بمستويات بعض الهرمونات للأشخاص العقيمين بقلة وضعف وتشوه النطف من الرجال .

**المنهجية :** جمعت خلال هذه الدراسة (65) عينة دم من أشخاص مصابين بأنواع مختلفة من العقم وتم عمل لها الطرد المركزي للحصول على المصل وكان معدل أعمارهم تتراوح بين ( 28-50 سنة ) في مختبرات مركز الخصوبة / مدينة الصدر الطبية / محافظة النجف الاشرف للفترة مابين 7/1 ولغاية 2012/10/1 م .

**النتائج:** أوضحت نتائج دراسة العينات زيادة نسبة معامل كتلة الجسم والعمر مع زيادة الاضطراب في نسبة الهرمونات المقاسة .وبينت نتائج الدراسة انخفاض معنوي ( $P<0.05$) في نسبة معامل كتلة الجسم مع تقدم العمر و زيادة في اختلال الهرمونات ( التيستوستيرون و الهرمون المحفز للجريبات والهرمون اللوتيني ) حيث وجدت العلاقة ارتباطيه سالبة. أوضحت نتائج الدراسة زيادة معنوية ( $P<0.05$) في تركيز هرمون الحليب مع زيادة معامل كتلة الجسم المتمثل ((بفوق الوزن الطبيعي )) مع وجود علاقة عكسية رابطة بينهما .

**الاستنتاجات:** يستنتج من هذه الدراسة بأنه يمكن أن يؤثر معامل كتلة الجسم (سلبياً) بمستويات الهرمونات الجنسية وغير الجنسية .وزيادة نسبة الرجال المصابين بالعقم .

**التوصيات :**نوصي من خلال الدراسة الحالية إلى التعرف على العلاقة بين تخفيض الوزن في الأشخاص ذو الوزن فوق الوزن الطبيعي وتأثير ذلك على فحص الهرمونات وخصوبة الرجال،فضلا عن زيادة التوعية حول مخاطر زيادة الوزن وعدم الخصوبة عن طريق إجراء الندوات والبرامج التثقيفية للوقاية من السمنة .

**Abstract**

**Objective:** The study aims to clarifying the role of the Body Mass Index on range of hormones for oligoasthenioteratospermia infertility patients in men.

**Methodology:** Out of (65) specimens of blood collected from patients suffering of different type of infertility ,the age of patients (28-50year). In Fertility Center Laboratories \ Al – Sadder Medical City at Al-Najaf Province , study period was between 1/7/2012 to 1/10/2012.

**Results:** The results of the study sample have revealed that an increase of percent of BMI in increased age with increased of hormone dysfunction. The study results had revealed significant decrease ($P<0.05$) of sex hormone ( LH ,FSH, Testosterone) negative relationship, and significant increased of prolactin hormones when the BMI increased which revealed positive relationship.

**Conclusions:** It can be concluded that BMI correlated (negative) with range of sexual and asexual hormone through increase of infertility men percent.

**Recommendations:** The available data recommended to be complemented by future cohort studies that define prospectively the extent of this relationship and examine the effect of weight loss in patients suffering from over weight (infertile) and effect it on sexual hormone, besides their increase community awareness about the risks of epidemic of increase weight and infertility by conducting seminars and educational programmers for reduce obesity.

**Keywords: BMI ; Sexual hormone ;Man Infertility .**

## INTRODUCTION

A persons weight can have a profound impact on fertility ,men who are either under or over their ideal weight have a higher risk of experiencing infertility (Bolumar *et al* .,2000). The body mass index (BMI) is the routine measure used to assess whether a person is under or over their ideal weight . When the BMI is less than or greater than the desired value it may lead to fertility problems in males and can disrupt the hormonal balance which is necessary for normal sperm production (Abdullah and Bakry ,2008).

Infertility in men is the incapability to make a fertile women pregnant after an act of sexual intercourse (Brugh and Lipshultz, 2004). The sexual bustle and the gonadal functions are mediated by the hypothalamic-pituitary-gonadal axis, which is a crowded loop system with feedback control from the testes (Xiong*et al*, 2006; Van Den Boogaard *et al*, 2011).The fertility hormones that are vital for normal sexual activity are the Testosterone, Progesterone,Estrogen, Prolactin, Follicle Stimulating Hormone (FSH) and Luteinizing Hormone(LH),Disorders of the hypothalamus lead to hypogonadotropic hypogonadism (Whitten *et al* ., 2006). Also, both pituitary insufficiency and excess causes infertility (Grover *et al*, 2005). Infection such as HIV has been concerned to affect the endocrine system which reverse the disorder that occur of sexual system(Roof and Hall, 2000; Pransanthai*et al*, 2007).

Some cases of male infertility are due to anatomical abnormalities such as varicoceles, ductal obstructions or ejaculatory disorders (Makker *et al*., 2009). A normal semen sample should have a volume of 1.5 to 5ml with greater than 20 million sperms/ml ,The number of abnormal sperm should be less than 40% with greater than 30% of sperm cells in a sample demonstrating proper motility, An estimated 40 to 90% of male infertility is due to deficient sperm production of indefinable origin (Sinclair, 2000).

In a medical condition in which excess body fat, or white adipose tissue ,accumulates in the body to the extent that this accumulation of fat might adversely affect health, potentially reducing life expectancy ( Roth *et al* .,2008). An individual can be defined as being overweight if their BMI is 25–30 kg/ $m^2$, and obese if their BMI exceeds 30 kg/ $m^2$ (Bolumar *et al* .,2000), However, the distribution of body fat specifically in the central abdominal region has also been used to diagnose a patient as obese and currently waist circumference is believed to be a more accurate marker of obesity, these definitions should only be considered as guidelines, as the risk of developing chronic diseases increases progressively when the BMI increases above 21 kg/ $m^2$ (Haslam and James,2005).

The objective of our study was to determine some of factors that are dependable for male infertility which it have relationship between body weight and some of sex hormone in the male presenting for treatment infertility to study that accountable becomes male infertile to found in future the answer to problem .

## PATIENTS

This study included the examination of 65 samples of blood for infertile patients. The samples were collected in Fertility Center Laboratories/ AL -Saader Medical City at AL-Najaf province , study period was between1/7/2012 to 1/10/2012.

## METHODS:

**1:Physical examination:**

Some physical methods were performed by physician method. Body weight was precise in kilograms using the same weighing Scale(balance) OSAW, India .Height was measured in meters and BMI was calculated as weigh in kilograms divided by squared height in meters. Then classify BMI in: underweight, ≤18.5 kg\ $m^2$; normal-weight, 18.5–24.9 kg\$m^2$; overweight, 25–29.9 kg\ $m^2$; and obese, ≥30 kg\$m^2$.

**2:Blood sample collection:**

Hormone analysis: Fasting blood samples were withdrawn after 10min. rest in the sitting position from each participant, centrifuged(Lab net international Inc

.Germany) and the serum was separated, liquated and frozen. All samples were analyzed under an approved protocol from the Fertility Center Laboratories. Serum level of total hormones concentration were measured using kits supplied by ELISA method (Testosterone, FSH, LH and prolactin were measured using type of specific ELISA kits (Accu- Bind,ELISA Microwells,USA).The serum samples were stored at - 20 $C^0$ until analysed .

**2:1: Estimation of Hormones .**

Serum LH was estimated by Enzyme Linked Immunosorbent assay (ELISA) . The procedure was as described by the manufacture of the kit (Accu- Bind, ELISA Micro wells, USA); Blood samples (5 ml) were obtained at 8:00- 11:00 AM; its centrifuged sera were preserved at frozen . Serum. FSH ,LH, PRL ,Testosterone levels were estimated by the same techniques the kit.

**3: Statistical analysis:**

Statistical tests were performed using version( SPSS VERSION, 17) of Statistical Package for Social Scientists (SPSS Inc.), to determine the mean and standard error of mean, and the relation ship of sample. Also the P value <0.05 considered to be significant in comparison among means of groups (George *et al*.,2003).

## RESULTS:

In the present study fitted examination of 65 blood specimens for infertile patients suffering from obesity , and the results reviewed the following:-

**1:Distrubution of BMI :**

The mean BMI of the male patients were 22.3±0.87 kg\$m^2$, the type of infertility found all primary Infertility ,The distribution of the BMI groups were founded significantly higher in increased age patients(28-50 year) .

**1: Correlation between BMI and hormones level :**

- Obesity may interfere with many testicular functions, thereby reducing both exo- and endocrine functions. Obese males usually express a characteristic hormonal profile described as "hypogonadotropic hypogonadism". In fact, both total blood testosterone levels are shown to be decreased. In the present study, Serum Testosterone figure(1) , LH figure(2) and FSH figure (3) all decreased significantly with increasing BMI,(significant negative correlation P value < 0.05) in infertile patients while Prolactin increasing with BMI in significantly positive relationship as shown in figure(4).

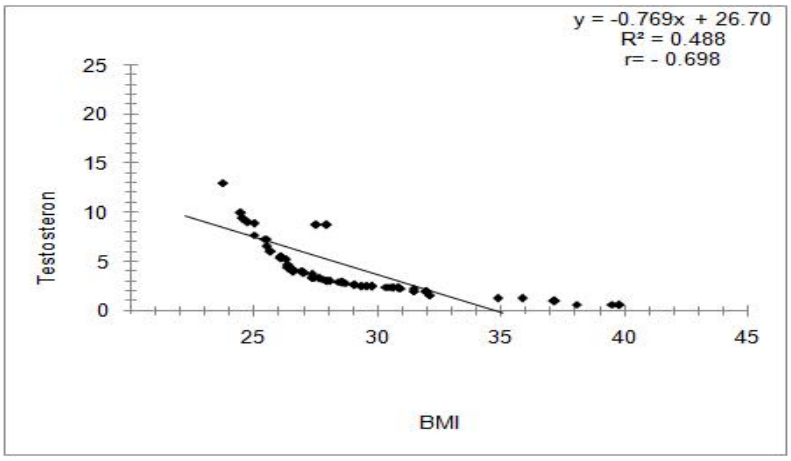


**Figure (1)The correlation between BMI and testosterone hormone level in infertile patients**

- Number of samples = 65.
- P value < 0.05

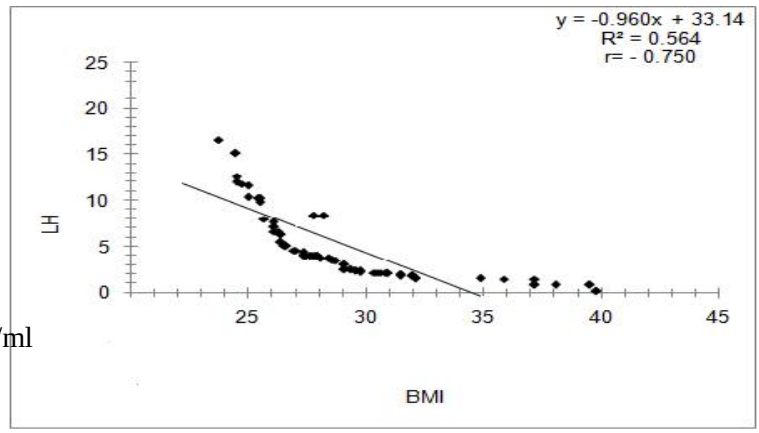


**Figure (2)The correlation between BMI and LH hormone level in infertile patients**

- Number of samples = 65.
- P value < 0.05

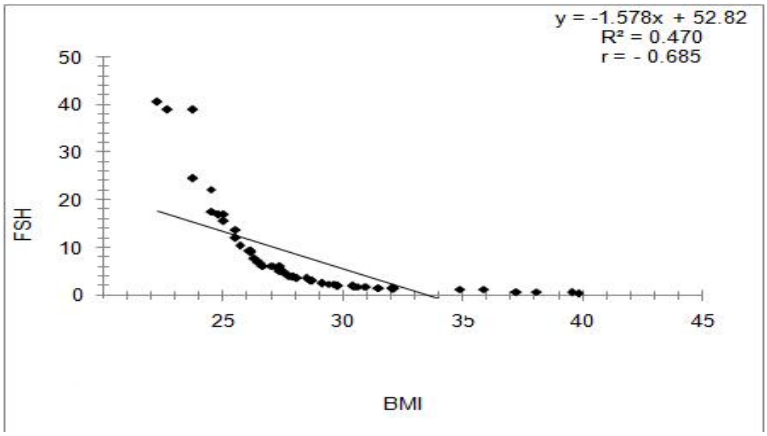


**Figure (3)The correlation between BMI and FSH hormone level in infertile patients**

- Number of samples = 65.
- P value < 0.05.

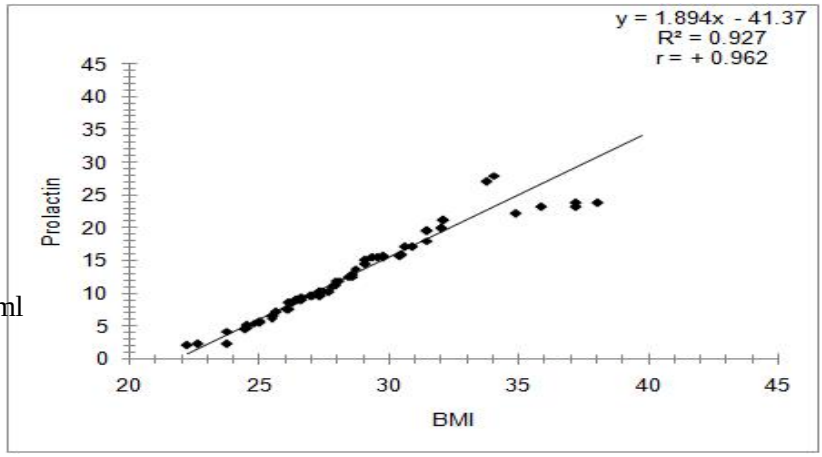


**Figure (4)The correlation between BMI and Prolactin hormone level in infertile patients**

- Number of samples = 65.
- P value < 0.05

## DISCUSSION:

Obesity is a chief physical situation topic and the relationship between obesity and male infertility has been described in recent times in many reports, In the present study, showed that BMI is associated with an altered hormonal profile by significant decreasing testosterone, LH and FSH levels and significant increasing prolactin level hormone, BMI can cause male infertility due to the problems of endocrinology in hypoandrogenism and increased infertility patients (Mara *et al*.,2008), Alter sexual hormones may affect spermatogenesis directly within the testis as well as by alterations in gonadotropin secretion by the pituitary. This in agreement with several published articles which elucidate the relationship between BMI and male infertility (Jensen *et al* ., 2004). Sometimes a huge psychological pressure is created related to the silhouette, physical appearance such as decrease weight, that does not solve the problem, rather brings the stigmatization, The obese person is discriminated in employment, in medical care, and this a fact we must fight against, if necessary by legislative measures, It is not sufficient to look at obesity as a social problem or a cosmetically one. Obesity became a serious disease, responsible for the premature death and morbidity, awareness of the socioeconomic and psychological costs of the obesity could be another way to reduce it (Olayemi, 2010) . A study over persons aged 45-74 years finds that the frequency of intercourse and desire do not correlate with the BMI, the duration of the present relationship and other social and sexual factors (education, income, frequency of exercise, stress symptoms etc.) . Puhl and Heuer , (2009) Obvious, the BMI influences sexual dynamics but the length, frequency and the quality of sexual intercourse requires multifactor evaluations and determinations, and variables like age, marital status, health status, the time since the couple was established, the partners fit, the quality of non sexual relation, life style, temperament etc, should be considered in this equation. Despite the fact no significant correlation between BMI high values and the frequency of sexual contacts, nevertheless we found a tendency, a specific pattern by weight groups of sexual contacts frequency decrease in the case of overweight and obese group. Subjects with

a normal weight are closer to a more intense sexual activity. From the normal sexual activity point of view, normal subjects are closer to overweighed ones (Rada *et al* 2011).

Obese men have been shown to exhibit higher levels of circulating estradiol and/or elevated estradiol/testosterone ratios in multiple studies (Fejes *et al*.,2005). Excess estrogen has a direct deleterious effect on spermatogenesis in animal models (Goyal *et al* ., 2003) also Estradiol may have deleterious effects on spermatogenesis (Akingbemi,2005).

BMI, induced increase conversion of testosterone to estradiol, and the effect this increase has on suppressing gonadotropin release and spermatogenesis (Nguyen *et al* ., 2007). In results found meet with researchers from Reproductive Biology Associates report that a high BMI in men correlates with reduced testosterone levels (Mara *et al*.,2008).

Low Testosterone levels in obese men are due to lower sex hormone-binding globulin, the enhancement of negative feedback on gonadotropin by the increased Estrogen (Jensen *et al* ., 2004) , Leptin disorder (Sarwat et al ., 2011) , and sleep apnea (Magnusdottir *et al* ., 2005).

The increased fat produces more Estrogen E2 from Testosterone, which suppresses the hypothalamic and pituitary hormonal secretion and can affect the testis directly by altering in spermatogenesis processes, Moreover, in over weight the sexual hormone – binding globulin (SHBG) levels are lower, which reflects on further testosterone deficiency (Carreau *et al*., 2002).

Adipose tissue is one of the tissues where conversion of androgens to estrogens took place , serum leptin did not correlate with serum E2 levels, Ishikawa *et al*. (2007) showed also that in men, serum leptin is inversely correlated with serum T only, where as in women, serum leptin is positively correlated only with serum E . (Rada *et al* .,(2011) thinks how many couples visit the therapist for sexual problems such as infidelity, lack of sexual attraction due to a partner who became overweight or obese, that can lead to health problems, unsatisfactory sexual life and sexual dysfunction .

## CONCLUSION :

It is concluded that male obesity can affect semen parameters partly mediated by hormones dysfunction. Further research focusing on the obesity impact on male infertility should be advocated to elucidate their interrelationship, if it however, to be seen whether weight loss may also improve semen quality.

## RECOMMENDATIONS:

Further studies on larger groups of men suffering from infertility causing by increasing of over BMI and treated him and supporting our in less weight , and work education program about how to deal with infertility patients behavior should be implemented to increase their knowledge about sexual hormone disorder and increase BMI in the men .

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