Estimation of Some Hormones Levels and Insulin Resistance in Some Infertile Men in Samarra City

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Abstract

The study aimed to evaluate levels of some hormones and insulin resistance in infertile men in Samarra city.

The study group include 25 infertile men and control group of 10 healthy men. The hormonal and biochemical assays include testosterone, E_2, insulin, IR and fasting blood sugar (FBS). The results was a significant increase at ($P \geq 0.05$) in E_2 and FBS concentrations, while testosterone show significant decrease at ($P \geq 0.05$) in infertile men compared to control group. Insulin and IR didn't show any significant difference between both groups.

***Key words**: male infertility, IR, testosterone, E_2, insulin.*

Introduction

Men infertility is defined as inability to conceive after one year of regular sex, and it effects 15-20% of couples [(1)]. The male infertility factors estimated in about 50% of cases [(2)], It can be caused by many conditions such decrease androgen levels, decreased sexual activity, anatomical disorders, genetic disorders and infections [(3,4)]. The hypothalamus- pituitary- testis axis has great importance in male fertility, follicle stimulating hormone (FSH) releasing from the anterior pituitary combined with receptors in sertoli cells and stimulates spermatogenesis process luteinizing hormone stimulates production of testosterone by Leydig cells [(5)].

Testosterone is responsible for normal development of male sex organs and keep secondary sex characteristics, it improve sperm motility and epididymis function [(6)].

Estrogen inhibits the hypothalamus- pituitary axis and subsequently FSH and LH so that reduce circulatory testosterone [(7)].

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Materials and Methods

Samples:

The samples was collected from the infertility outpatient clinics in Samarra city. The total members of infertile men was 25 as a study group and 10 healthy fertile men were consider as control group.

Blood collection:

Blood samples was collected from the cuboidal vein. The samples left for 15 min at room temperature. Then centrifuged at 5000 rpm for 10 min. the serum transported to test tubes until examination.

Hormonal analysis:

The concentrations of hormones (testosterone, E_2 and insulin) were measured via enzyme linked immune sorbent assay (ELIZA) by using the commercial kits (ELIZA kit, Human, Dimeditic, Germany) and procedures was followed as given in the kits catalogs.

Biochemical analysis:

Fasting blood sugar concentration quantified by followed the procedure that given with kit (bio Maghreb, Tunisia) insulin resistance was stimulated by using

homeostatic model assessment of insulin resistance which equal:

HOMA (IR)= fasting insulin (µl/ml)* fasting blood sugar (mg/dl)/450

HOMA (IR)= homeostasis model assessment [8].

Statistical analysis:

All values expressed as mean± S.D data analyzed done by using analysis of variance (ANOVA).

Results

The results shows in table (1) significant increase E_2 levels and significant decrease in testosterone levels in infertile men group compare with control group and glucose concentrations shows significant increase in infertile group compare with control group while insulin levels and IR didn't shows any significant difference between groups

Table(1): Hormones, FBS, IR levels in infertile and control group

Groups	FBS (mg /d L)	IR	Insulin	E2	Testosterone
Control group	90.33 ±4.02 B	6.608 ±0.752 a	29.608 ±2.902 a	15.848 ±1.420 b	1.780 ±0.220 a
Infertile group	99.48 ±5.29 A	7.114 ±1.501 a	28.971 ±2.902 a	36.912 ±9.422 a	1.588 ±0.121 b

Discussion

High of estrogen in males results from increase conversion of androgen to estrogens due to bio availability of aromatase enzymes [9]. Estrogen is more biologically active than testosterone even at low levels therefore; same changing in circulating estrogen level can increase the action of abnormal activity of estrogen in the testis [10]. Estrogen might contribute to decrease testosterone levels through negative feedback mechanism [11]. Estrogen can act on the hypothalamus to negative regulation to release of gonadotropin releasing hormone (Gn RH) as well as release of FSH and LH from pituitary gland and estrogen showed an inhibitory effect on androgen biosynthesis, this indicates that any amount of excess estrogen could determine spermatogenesis [11]. High estrogen level can lead to testis injury and inhibit development of sertoli cells [12] , and can decrease testosterone production from lydig cells [13],decreased testosterone level agreement with [14] .

Insulin levels and IR showed increase but non-significant hyperinsulinemia which occur in some obese men has an inhibitory effect on spermatogenesis and related with decreased male fertility [15]. [16] reported that increase of IR lead to decrease of testosterone production from lydig cells.

The results also show significant increase in glucose concentration in infertile men and that increases leads to an ability to have children whether it's because direct effect on testis and it capability on sperm formation or due to infect the patient with sexual dysfunction or difficult extrusion, also decreased testosterone levels related with high glucose concentrations [17].

Conclusion

This study confirm that causes of male infertility in some men in Samarra city was increased levels of E_2, glucose and decrease testosterone level while then insulin and IR didn't show any significant difference.

Ethical Clearance: The Research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq

Conflict of Interest: The authors declare that they have no conflict of interest.

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