

cause of abnormalities in glucose tolerance, Dyslipidemia, endothelial dysfunction and inflammation(5). Resistin is adipocyte-derived cytokine that plays an important role in the development of insulin resistance and obesity in rodents(6). Resistin discovered in 2001, is a novel adipocyte-secreted factor that has been proposed to be link between-obesity and insulin resistance(7). Resistin is a secreted by adipocyte in mice a major role whereas in human, resistin mainly come from monocytes and macrophages (8). Steppan *et al.*, (7) showed that resistin mRNA and protein may present normally in cycling rats in all stages of the estrus cycle in addition to ovaries and may differ in ovaries of an animal model of human PCOS. Some studies found a significant association between resistin and the development of obesity and insulin resistance. Panidis *et al.*, (9) has been found that resistin, novel signaling molecule isolated in mice and may have role in PCOS and associated with insulin resistance affected the infertility treatment with PCOS. However, (10) reported a significantly higher of resistin in PCOS patients. Other who reported that women with PCOS have elevated serum level of free Insulin-Like Growth Factor-I (IGF-I) (11). Stimulatory effects of insulin and IGF-I on estradiol production by mammalian granulosa cells are documented(12). Kevin *et al.*, (13) found that Sex hormone binding globulin(SHBG) is the major sex steroid-binding protein in human plasma and is produced by the liver. Plasma SHBG levels vary considerably between individual and are influenced by hormonal, metabolic and nutritional factors(14). The present study was aimed to evaluate the relationship between insulin resistance and some hormonal changes in rats with PCOS.

MATERIALS AND METHODS

Twenty virgin adult cycling female rats, weighing 200 ± 15 g were used. The animals were housed four to each cage under optimum condition (12/12 light, dark cycle, 22 ± 2 C°). the rats were allowed free access to pelleted rat chow and tap water. The rats were divided into two groups: **Control group:** included 10 virgin female rats were given a single i.m injection 0.2ml of pure oil corn each rat. Second **PCOS group:** included 10 rats were administrated i.m a single injection of 4mg each rat of estradiol valerate (EV) dissolved in 0.2ml of pure corn oil to induced PCOS and left for 63 days. After 63 days of EV injection, when persistent estrus is present rats were anesthetized with chloroform and sacrificed to obtain the blood. The blood samples were collected from inferior vena cava by sterile syringe. It was deposited in Plain

tube without anticoagulant. The serum was obtained from blood by centrifugation at 5000 rpm for 15 minutes and stored in micro-ependedoff tubes at -20C° until for the following assays resistin, insulin, IGF-I, SHBG, Follicular Stimulating Hormone (FSH), Luteinizing Hormone (LH) and Free Testosterone (FT) by means of ALISA Kits.

Studied parameters

Estimation of serum resistin, insulin, IGF-I, SHBG, FSH, LH and FT concentration were measured by the following instructions of Kit(*DRG Instrument GmbH, Germany, EIA-4572*)

Statistical analysis

All data were presented means ± SD. Student t test was performed using SSPS, version 10.0. a value of P≤0.05 was considered statistically significant.

RESULTS

As shown in table 1, a significant (P≤0.05) increase in serum resistin, insulin, IGF-I, LH and FT were observed in group of female rats treated with 4 mg/rat of EV in order to induction polycystic ovary syndrome compared with control group. SHBG exhibited significant (P≤0.05) decrease in serum concentration of female rats with PCOS induced- female rats compared with control group. On the other hand, there was no significant difference observed in FSH concentration between the two groups.

Table, 1, Effect of induced polycystic ovary syndrome on some serum hormones concentration in female rats. (Mean ±SD) (n=10).

Parameter Groups	Resistin ng/ml	Insulin μIU/ml	IGF-I. ng/ml	SHBG. μg/ml	FSH. IU/L	LH. IU/L	FT. pg/ml
Control	b 2.15± 0.99	b 2.17± 0.45	b 19.02± 1.85	a 3.50± 0.33	a 4.12± 0.77	b 3.06± 0.52	b 0.70± 0.25
induced PCOS	a 4.45± 1.32	a 4.81± 1.03	a 29.14± 2.14	b 1.08± 0.57	a 3.73± 0.59	a 6.38± 1.76	a 1.47± 0.47

Values expressed in the small letters refer a significant differences at the

(P<0.05) level.

DISCUSSION

The results of the present study as presented in table 1 revealed a significant increase in the resistin hormone concentration in induced group PCOS rats. Similarly, Steppan *et al.*, (7) found that serum resistin levels are significantly increased in serum insulin-resistance in mice and genetic(ob/ob, db/db) or diet-induced obese mice. Some studies, have shown elevated concentration of serum resistin in women with PCOS. (Murin *et al.*, (15) and Yilmaz *et al.*, (16) which is known to be associated with hyperinsulinaemia, hyperandrogenism and insulin resistance (17). Seow *et al.*, (18) showed that resistin mRNA levels in adipocytes were increased 2-fold in PCOS patients, suggesting that the resistin gene may be a local determining factor in pathogenesis of PCOS. In contrast, variation in resistin gene promoter was not associated with PCOS (19). However, Panidis *et al.*, (9) found significantly high levels of resistin in the group of PCOS women with body mass index(BMI) more than 25 kg/m² compared with normal women with PCOS and BMI less than 25kg/m² and control. Wing *et al.*, (20) found that serum resistin levels in obese and non obese PCOS group were significantly higher than in their controls and serum resistin levels was positively correlated with LH and LH/FSH ratio. From these result we suggest that resistin might play important roles in the pathogenesis of insulin resistance in PCOS patients. The results of the present study also, showed a significant($P \leq 0.05$) increase insulin, IGF-I, LH, FT and a significant ($P \leq 0.05$) decrease in SHBG. It has postulated that elevated insulin and IGF-I along with elevated LH acting on the thecal compartment in vivo, contribute to the hyperandrogenemia observed clinically in PCOS (21, 22). In vitro androgen synthesis is stimulated by both IGF-I and insulin acting on theca-interstitial cells (23).

Serum and follicular insulin like growth factor binding protein-I(IGFBP-I) concentration are decreased in PCOS, presumably due to the hyperinsulinaemia and

consequent suppression of IGFIBP synthesis (24, 25). The decreased IGFBP-I concentration could be lead to elevated levels of free IGF-I, which may then stimulate ovarian androgen synthesis. Insulin resistance in PCOS patients tent to have lower SHBG and higher insulin concentration and need more FSH during stimulation(10).

Hyperinsulinemia by inhibiting hepatic synthesis of SHBG can cause in hyperandrogenism. In addition, excessive insulin can bind insulin like growth factor – 1 (IGF – 1) receptors in the ovary that may lead to increased IGF-I and androgen production by thecal cells(26). Hyperinsulinemia may contribute to hyperandrogenemia by direct effect on the ovary as well as by negative impact on sex hormone-binding globulin (SHBG) levels (27).

العلاقة بين مقاومة الأنسولين وتركز الرزستين وعامل النمو الشبيه بالأنسولين-المصاحب لمتلازمة تكيس المبايض المتعدد المستحدث في إناث الجرذان

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الخلاصة

أجريت الدراسة الحالية لتحديد العلاقة بين الرزستين وعامل النمو الشبيه بالأنسولين ومقاومة الأنسولين في إناث الجرذان المستحدث فيها متلازمة تكيس المبايض المتعدد. استخدم في هذه الدراسة (20) عشرون من اباكير الإناث الجرذان البالغة , قسمت إلى مجموعتين بواقع (10) عشرة إناث لكل مجموعة. المجموعة الاولى : مجموعة السيطرة: حقنت جرعه واحده بالعضل 0.2 مل من زيت الذرة النقي لكل جرذ . المجموعة الثانية: مجموعة متلازمة تكيس المبايض المتعدد PCOS: حقنت لمرة واحده بالعضل 4ملغم من استراديول فاليريت-بيتا -17 مذاب في 0.2مل من زيت الذرة النقي وتركت لمدة 63 يوما. بعدها تمت التضحية بجميع حيوانات التجربة وتم جمع عينات الدم من الوريد الأجوفا الخلفي للحصول على مصل الدم لقياس تركيز كل من: Resistin, Insulin, Insulin-Like Growth Factor-I(IGF-I), Sex Hormone Binding Globulin (SHBG), Follicular Stimulation Hormone (FSH), Luteinizing Hormone (LH) and Free Testosterone FT. أظهرت النتائج زيادة معنوية في مستوى تركيز كل من : resistin, insulin, IGF-I, LH and FT في مجموعة الجرذان المستحدث فيها متلازمة تكيس المبايض متعدد , في حين لوحظ نقصان معنوية في تركيز SHBG في مجموعة المعاملة مقارنة مع السيطرة, بينما لم يظهر تغير معنوي بتركيز FSH بين المجموعتين. ويستنتج من هذه الدراسة أن مقاومة الأنسولين تلعب دور مهم في أمراضه متلازمة تكيس المبايض متعدد وارتفاع مستوى الرزستين وعامل النمو الشبيه بالأنسولين-1.

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