

Assessment of Serum Irisin and Vaspin in Women with Polycystic Ovary Syndrome in Mosul City

Saba Khair Alddin Ibrahim*

Saba Khair Alddin Ibrahim*

Department of Basic Science, Dentistry
College, Environmental Researches Center,
University of Mosul, Mosul, IRAQ.

Correspondence

Saba Khair Alddin Ibrahim

Department of Basic Science, Dentistry
College, Environmental Researches Center,
University of Mosul, Mosul, IRAQ.

E-mail: Saba_physiology4@uomosul.edu.iq

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ABSTRACT

Patients with “polycystic ovary syndrome” (PCOS) may have changes in adipokine levels due to obesity rather than PCOS per se. This should be taken into account as there is a correlation between adipokine levels and BMI. The objective of the subsequent investigation was to measure serum levels of irisin and vaspin in women with PCOS. In the following study, overall, 140 sample size was selected for the evaluation. These 140 were divided into two groups in which 70 women were on the one group which was the intervention group, and 70 women were in control group. The control group of the study were the women who reportedly had regular and normal menstrual cycle. The results indicated high values of vaspin and irisin. The results of this study and previously published literature suggest that both adipocytokines are associated with high blood glucose levels and higher BMI, and finally, both values remain higher in women with PCOS. Vaspin and irisin could be considered as a biomarker for prognosis and therapy follow-up in patients with PCOS.

Key words: Vaspin, Irisin, Insulin, Testosterone, LH, FSH, PCOS.

INTRODUCTION

Polycystic ovary syndrome (PCOS) is a common disorder which is associated with the metabolic and endocrine system.¹ It affects approximately 10 percent of women of childbearing age, depending on various diagnostic criteria. It can be identified by anovulation, infrequent ovulation, hyperandrogenism and/or polycystic ovaries.² A much higher incidence of obesity has been reported in patients with PCOS, raising the possibility that obesity is associated with the onset and symptoms of PCOS.

As it has found to be common in this patient population, 40% to 80% of women with PCOS are found to be either obese or overweight.^{3,4} The familial association of PCOS is an important piece of evidence for genetic susceptibility. Women with PCOS are not always infertile, especially those with regular cycles. However, conception may be difficult for women with irregular menstruation. The main cause of infertility in PCOS is anovulatory failure.⁵ Obesity appears to be one of many factors, including others, that increase fertility. For various reasons, having children may be difficult for obese patients of PCOS.

The treatment of choice for anovulatory infertility in patients with PCOS is ovarian induction. The first course of treatment involves dietary and behavioral modifications. However, this takes time and women are often reluctant to do so. Some medications are used in PCOS to induce ovulation.⁶ There is not enough research on how excess body fat affects the response to ovulation-inducing drugs in patients with PCOS.

Patients with PCOS may have changes in adipokine levels due to obesity rather than PCOS per se. This should be taken into account as there is a correlation between adipokine levels and BMI, and according

to a meta-analysis, patients with PCOS usually have a higher BMI and a higher degree of obesity.⁷ The etiology and symptoms of PCOS, thought to involve hyperandrogenism, IR and chronic inflammation, may be better understood by knowledge regarding the fluctuations of levels of adipokine in patients with PCOS without obesity.⁸

It is not known what role irisin plays in the development of polycystic ovarian syndrome. The higher irisin levels observed in patients with polycystic ovarian syndrome have led to the hypothesis that irisin may contribute to the development of the disease.⁹ This hypothesis is currently supported by a number of other studies.^{10,11} However, other studies have found no difference in irisin values between women with polycystic ovarian syndrome and healthy women and have even found lower irisin values in women with polycystic ovarian syndrome. The relationship between irisin and IR has also been variable in these investigations. To determine whether irisin is associated with IR, a meta-analysis of circulating irisin levels in women with PCOS and healthy women was conducted.¹² This study found that obesity and PCOS were associated with higher serum irisin levels. Treatment with metformin helped patients with normal weight PCOS, although serum vaspin levels were not greatly reduced. In addition, minor weight loss did not appear to have an effect on serum vaspin levels.¹³ A compensatory mechanism for maintaining insulin sensitivity and glucose tolerance in patients with PCOS, especially in overweight or obese women, may be an increase in serum vaspin levels. The objective of the subsequent investigation was to measure serum levels of irisin and vaspin in women with PCOS.

PATIENTS AND METHODS

Study design: The following study is based on a randomized control trial which is based on the evaluation of the levels of vaspin and irisin on the

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patients of PCOS. The population receiving the program intervention was randomly selected from the eligible population, and the control group was randomly selected from the same eligible population, an experimental form of impact evaluation.

Target Population: In the following study, overall, 140 sample size was selected for the evaluation. These 140 were divided into two groups in which 70 women were on the one group which was the intervention group, and 70 women were in control group. The control group of the study were the women who reportedly had regular and normal menstrual cycle.

This study followed The Rotterdam criteria, which has stated that polycystic ovaries, hyperandrogenism and ovulatory dysfunction must all be present for a diagnosis of ovarian cancer to be made.

Measurement of Testosterone, Follicle stimulating hormone, and LH: For the evaluation of LH, testosterone, and follicle stimulating hormone in the body, the study has used the chemiluminescence inoculation.

Measurement of vaspin and irisin: For the evaluation of levels of irisin and vaspin, the following study has used the ELISA kit which has been widely used and it is complete

Statistical analysis: The results of the data have been analyzed using descriptive analysis and inferential analysis. The descriptive analysis has represented the values in mean, percentages, and standard deviation. While the inferential analysis included the use of statistical tests including linear regression, to represent the correlation.

RESULTS

The demographic details of the participants indicated that there was a total of 140 participants, out of which 70 participants were included in the intervention group while the rest 70 were in controlled group of the study. The mean age of the participants was considered as 23.81 in the PCOS group (SD ± 3.20), and the mean age of controlled group was 23.55 with the standard deviation ± 1.63. The findings of the BMI indicated that in the in the PCOS group the man BMI was 24.00 and SD ± 4.41. while in the controlled group the mean BMI was found to be 22.51 and SD ± 2.31 (Table 1).

On the evaluation of the level of vaspin, it was found that the mean value of vaspin was 1.75 ± 0.4 in the PCOs group while the similar value was 0.56 ± 0.33 in the controlled group. These results indicated that there was high vaspin in the women with PCOS. The results of the evaluation of irisin represented that 197.73 ng/ml and SD ± 68.11 was recorded in the PCOS group while the value was 7.32 and SD ± 64.04 in the controlled group. This represents a marked increase in the levels of irisin in PCOS group. The recorded vale of LH in the PCOS group was 13.49 with SD ± 11.01, and the value of LH in controlled group was 5.33 ± 1.82. the levels of testosterone were 76.5 (SD ± 29.36) in the PCOS group and 33.1 (SD ± 13.57) in the controlled group. FSH was recorded as 5.63 in the PCOS group and 6.04 SD ± 1.87 in the controlled group. Lastly, Insulin was found to be 11.11 ± 6.9 in the PCOS group and 7.32 ± 3.85 in the controlled group (Figure 1).

Table 1: Demographic parameters of studied group.

Parameters	PCO (n=70)	Control (n=70)	p value
Age (years)	23.81±3.2	23.55±1.63	ns
BMI (kg/m ²)	24±4.41	22.51±2.31	ns

Ns=non-significant, BMI=body mass index, Kg=kilogram

Table 2: The correlation (r) in PCOS between vaspin and irisin in relation to insulin.

Correlation (r) in PCOS	Insulin
Vaspin	0.061
Irisin	0.54

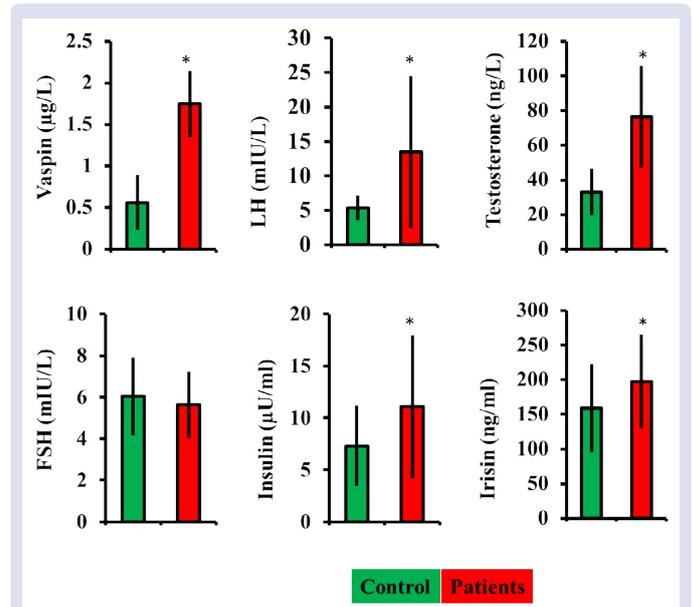


Figure 1: Hormonal profile in PCOS patients compared to control group. Data expressed as mean±SD, *p<0.05. LH=leutinizing hormone, FSH=follicle stimulating hormone.

On the evaluation of the correlational analysis, it was found that there was a statistically significant correlation between vaspin and insulin r = 0.06, while the correlation value of irisin with insulin represented r = 0.54 (Table 2).

DISCUSSION

The results of the following study represented that the values of vaspin in the PCOS group was comparatively very high in the PCOS group as compared to the controlled group. These values were supported from the previous literature which found that, 1t 30 weeks, when insulin levels were highest in OLETF rats, vaspin levels in visceral adipose tissue increased; however, when diabetes developed after 50 weeks, vaspin levels decreased.¹³ In addition, vaspin was found to significantly increase insulin sensitivity and glucose tolerance in obese, dieted mice. In addition, new research reveals a favorable association between vaspin gene expression in human adipose tissue and vaspin levels in blood and type 2 diabetes.¹⁴ According to results of further studies, elevated vaspin levels (3.74 ng/mL) were associated with clomiphene resistance in patients with PCOS, suggesting that serum vaspin levels may be a useful marker for predicting ovulation-inducing effects of clomiphene citrate treatment.¹⁵ PCOS is a common disorder associated with the metabolic and endocrine system. It affects approximately 10% of women of reproductive age, depending on the diagnostic criteria. It can be identified by anovulation, irregular ovulation, hyperandrogenism and/or polycystic ovaries. The following study is based on a randomized controlled trial in which vaspine and irisine levels were measured in patients with PCOS. In the following study, a sample size of 140 was selected for evaluation. These 140 individuals were divided into two groups, with 70 women forming the intervention group and 70 women forming the control group. The control group in the study consisted of women with normal menstrual cycles. When assessing the levels of vaspin, it was found that the mean value of vaspin in the PCOS group was 1.75 ± 0.4, while the similar value in the control group was 0.56 ± 0.33. The results of irisin assessment showed that the PCOS group recorded 197.73 ng/ml and SD ± 68.11, while the values in the control group were 7.32 and SD ± 64.04. This indicates that the polycystic ovarian syndrome group had significantly increased levels of irisin. The results of this study and previously published literature suggest that both adipocytokines are associated with high blood

glucose levels and higher BMI, and finally, both values remain higher in women with PCOS.

On the other hand, the following study represented that irisin was also significantly high in the PCOS as compared to the controlled population and it represented with significantly high results. Serum irisin levels were significantly higher in women with PCOS compared to women without PCOS.¹⁶ However, circulating irisin levels were comparable between healthy women and PCOS patients with a normal androgenic phenotype.¹⁷

The similar studies have indicated that circulating irisin levels were higher in patients with PCOS than in normal healthy controls, but this association disappeared when the researchers compared them to healthy controls with the same body mass index as patients with PCOS.^{18,19} In addition, it has been suggested that BMI, a measure of weight status, may act as a modulator of circulating irisin changes in patients with PCOS. Furthermore, this meta-analysis showed that circulating irisin was reduced in response to hyperinsulinemia in patients with PCOS, but to a greater extent than in healthy controls, suggesting that the function of patients with PCOS in this regard may be impaired.²⁰ Cellular behaviors and secretome profile might changes due to localized normal milieu *via* physiological conditions²¹⁻²⁴ or pathological conditions (polycystic ovarian syndrome) as in the case with irisin and vaspin.⁵⁻¹⁰

The results of this study and the references from the previously published literature represents that both the adipocytokines were correlated with the high blood glucose level, higher BMI, and lastly, both the values remained higher in the women who had PCOS.

CONCLUSION

Vaspin and irisin could be considered as a diagnostic marker for patients with PCOS and have a great correlation with the disease profile and other associated metabolic markers, such as, insulin.

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ADHERENCE TO ETHICAL STANDARDS

The study was approved by the Research Ethical Committee and Scientific Committee in the Department of Dental Basic Science of the College of Dentistry/ University of Mosul.

FUNDING

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CONFLICT OF INTEREST

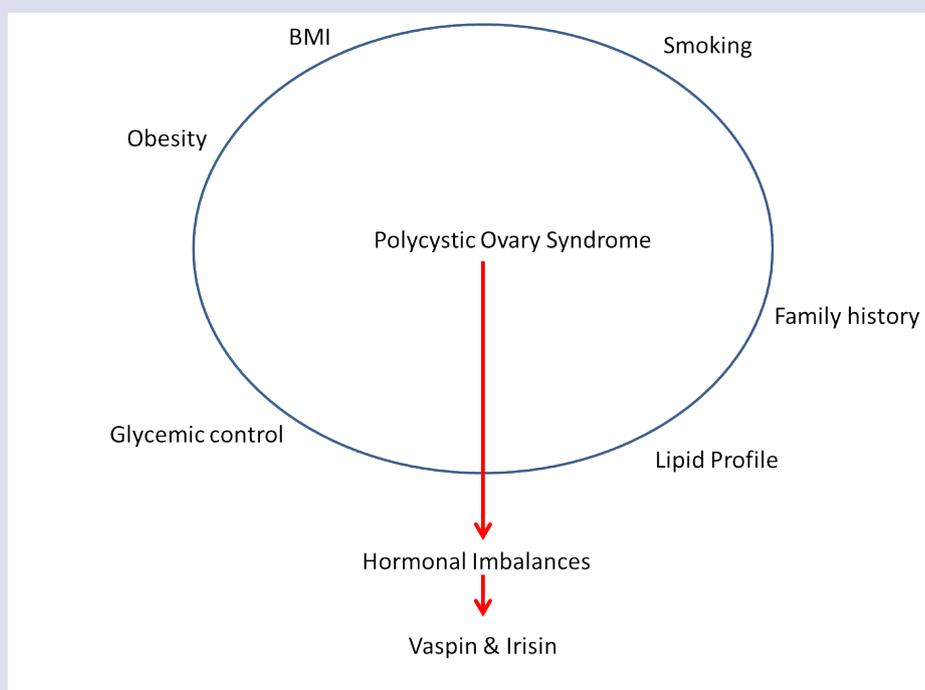
The authors declare no conflicts of interest concerned in the present study.

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GRAPHICAL ABSTRACT



ABOUT AUTHORS



Saba is currently a Director of Environmental Research Centre and also a Lecturer at the Department of Dental Basic Sciences, College of Dentistry at University of Mosul, Iraq. She has been graduated from College of Science/University of Mosul in 1994. She received her MSc. degree in Science from the College of Science/Tikrit University in 2012. Also, she received her PhD degree in Science from the College of Science/Tikrit University in 2017.

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