Journal of the Faculty of Medicine Baghdad (J Fac Med Baghdad) Vol.xx. No.x 2026
Print ISSN: 0041-9419, Online ISSN: 2410-8057
Open Access Research Article

Assessment of Corin and Neprilysin in Diverse Polyendocrine Metabolic Ovarian Syndrome Presentations

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Abstract:

Background: Polyendocrine Metabolic Ovarian Syndrome (PMOS) is a highly prevalent endocrine disease that affects women of reproductive age. Corin and Neprilysin are developing biochemical markers linked to the metabolic complexities of PMOS. Both are enzymes involved in the mechanisms that regulates adipose tissue metabolism.
Objective: To assess the clinical and diagnostic value of Corin and Neprilysin in a variety of phenotypic manifestations of PMOS, with a focus on their possible functions as biomarkers for illness classification and definition.
Methods: This observational case-control study was conducted on 150 women aged 18-41 years at Baghdad Teaching Hospital, Baghdad, Iraq from February to September 2025. The study groups included 50 healthy childbearing women as a control group and 100 women with PMOS, who were subdivided into four groups based on phenotype depending on Rotterdam consensus criteria to: 61 with hyperandrogenism, 15 with normal morphology by ultrasound, 14 with a normal menstrual cycle, and 10 with normal androgen levels. A spectrophotometric pathway was used to evaluate fasting blood glucose (FBG). Other markers (insulin, Neprilysin, Corin, sex hormone-binding globulin (SHBG), and total testosterone) were tested by the ELISA technique.
Results: The median value of Neprilysin in all PMOS groups was significantly higher than controls ($p<0.0001$), with non-significant differences among PMOS subgroups. Serum Corin levels were significantly lower in PMOS groups than controls, with non-significant differences among PMOS subgroups. There were none significant age differences between study groups, a significant positive correlation between Neprilysin and each of the following: Insulin ($P = 0.027$), HOMA-IR ($P = 0.023$), and Total Testosterone ($P = 0.006$), respectively.
Conclusion: Corin and Neprilysin seem to be promising biomarkers for enhancing the diagnosis and stratification of PMOS functional phenotype, offering valuable insights into personalized approaches to patient management and future research directions.

Keywords: Corin; Hyperandrogenism; Neprilysin; Polyendocrine Metabolic Ovarian Syndrome.

Received: 5 March 2026, Revised:30 April 2026, Accepted:16 May 2026, Published Online: June 2026

Citation: *Fleih MH, Elyassin HD, Al-Naddawi AM. Assessment of Corin and Neprilysin in Diverse Polyendocrine Metabolic Ovarian Syndrome Presentations. J Fac Med Baghdad 2026. https://doi.org/10.32007/jfacmedbaghdad3314*

Introduction:

Polyendocrine Metabolic Ovarian Syndrome (PMOS), previously termed Polycystic Ovary Syndrome (PCOS), The older term PCOS is misleading, as it implies pathological ovarian cysts while overlooking the broader endocrine and metabolic disturbances (1). PMOS is a highly prevalent endocrine disease that affects women of reproductive age on a global scale. Its estimated that its prevalence varies between 5% and 20% (2). This chronic and heterogeneous disorder is associated with menstrual dysfunction, infertility, hirsutism, acne and obesity. The diagnostic criteria for PMOS includes 12 or more follicles per ovary measuring 2–9 mm in diameter and/or an increased ovarian volume greater than 10 cubic centimeters by ultrasound, ovulatory dysfunction (oligomenorrhea or amenorrhea), and hyperandrogenism clinically or biochemically. In addition to its effects on the reproductive system, PMOS increases the risk of metabolic diseases such as insulin resistance, type 2 diabetes mellites and cardiovascular disease, which are major public health issues (3,4). On the other hand PMOS is an endocrine and metabolic disorder affecting women of reproductive age. As an overall general female endocrine disease, it not only affects endocrine functions, leading to infertility, but also induces various diseases such as depression, endometrial cancer as well as crinosity, obesity and lipsotrichia, all of which can influence the patients' body shape and appearance (5). It is estimated that many women with PMOS tend to exhibit insulin resistance (IR), irrespective of their body mass index (BMI). IR exacerbates hyperinsulinemia, which in turn stimulates androgen production by the ovaries, further exacerbating the hormonal imbalance that is unique to PMOS. In addition, IR makes women with PMOS more susceptible to long-term problems, such as, type 2 diabetes mellites, metabolic syndrome and cardiovascular disease (6). The majority of women with PMOS (~ 60%) diagnosed using the Rotterdam criteria, exhibit hyperandrogenism (HA). In addition to obesity, an independent risk factor for PMOS also increases HA and exacerbates many disorders, including IR and hyperinsulinemia that lead to decreased levels of the SHBG, which in turn causes an increase in free androgens (7).

Neprilysin (EC 3.4.24.11, neutral endopeptidase, NEP), is an enzyme widely distributed in human tissue, The extensive presence of NEP, coupled with its capacity to interact with various substrates, highlights its critical involvement in the physiological processes of the cardiovascular, renal, gastrointestinal and neurological systems (8). NEP has 749 amino acids and three main domains: A short amino-terminal cytoplasmic domain, a single transmembrane helical domain and a carboxy-terminal extracellular domain comprising a zinc-binding active site. These domains enable the enzyme's catalytic activity when substrates attach to the extracellular domain (9). NEP has an enzymatic function that extends beyond the cardiovascular system; it also antagonizes a range of molecules integral to neurological functions, pain perception, inflammatory responses, cell division, blood vessel formation and the digestive process, mainly metabolic (10). The source of the impacted, often-occurring, enzyme release, indicates a shift in NEP levels. The largest amounts of NEP are detected in the kidneys, followed by the gastrointestinal system, liver, male genital organs, lungs and ovaries. NEP is present in the ovaries, where its activity and levels are associated to the ovarian function and conditions like PMOS (11). Future research needs to evaluate the link between NEP activation and the disease status, as well as a regulation of total NEP activity, which likely has a tissue-specific foundation. The circulating NEP may serve as a biomarker for PMOS, reflecting an causal ovarian dysfunction (12). NEP may have an impact on glucose metabolism, according to recent research. It stimulates the elevated glycaemia and increases gluconeogenesis, glycogenolysis and fatty acid oxidation, by indirectly acting antagonistically against insulin through the activation of glucagon. Bradykinin, natriuretic peptides and glucagon-like peptide-1 (GLP-1) are a few of its substrates that affect glucose metabolism (8).

Corin is an essential protein in the pathway of atrial natriuretic peptide synthesis. Recently, researchers have been conducted to evaluate Corin levels in metabolic disorders represented by PMOS. Abnormal Corin levels could predict many cases of PMOS and acknowledge the metabolic changes within the syndrome (13). Some studies showed that plasma Corin level has pathophysiological and diagnostic significance for PMOS (14). Intriguingly, some studies' data identified several significantly differentially expressed genes of Corin changes in PMOS; the determination of these markers in the ovary might play a crucial role in the development of PMOS (15).

This study aimed to assess the clinical and diagnostic value of Corin and Neprilysin in a variety of phenotypic manifestations of PMOS, with a focus on their possible functions as biomarkers for illness classification and definition.

Cases and methods

Study design and participants: This observational case-control study was conducted on 150 women at the department of Gynecology and Obstetrics in Baghdad Teaching Hospital, Baghdad, Iraq from February to September 2025. In order to compare the serum levels of NEP, Corin, Insulin, Sex Hormone Binding Globulin (SHBG), Total Testosterone, and Fasting Blood Glucose (FBG) between women with PMOS as (cases, n = 100) and healthy childbearing women as (controls, n = 50) who were women visiting the hospital's outpatient clinics for routine check-ups. By using clinical and biochemical examination in compliance with the Rotterdam consensus criteria-2003(7), the researching physician selected the participants depending on the presence of at least two of the following:-

- Oligo/anovulation
- Clinical or biochemical hyperandrogenism
- Polycystic ovarian morphology on ultrasound·

The data was collected and monitored, and the participants were allocated to one of five groups:

- Group A includes all three properties of the segregation classification with hyperandrogenism + multiple cysts on one or two ovaries + irregular cycles (n=61)
- Group B with normal morphology by ultrasound, but hyperandrogenism + irregular cycles (n=15)
- Group C with normal menstrual cycle (no amenorrhea), but hyperandrogenism + multiple cysts on one or two ovaries (n=14)
- Group D with normal androgen level, but irregular cycle or multiple cysts on one ovary or two (n=10)
- Group E healthy women as control (n = 50)

The study was approved by the Institutional Review Board of the Department of Biochemistry, College of Medicine, University of Baghdad. at number (122) in 6/2/2025.

Eligibility criteria

Inclusion criteria included:

- A woman in the reproductive age range of 18 to 41 to reduce confusion about menopause and teenagers.
- Various PMOS phenotypes: Depending on combinations of the above-mentioned parameters, people were categorized into phenotypes (A, B, C, and D).
- BMI range between 18–35 kg/m², to include both normal weight, overweight and obese women.
- Non-pregnant and non-lactating women: To avoid hormonal influences unrelated to PMOS.
- No insulin-sensitizing medications or hormonal treatment in the previous three to six months (such as metformin, anti-androgens, or oral contraceptives).
- A willingness to give informed consent.

Exclusion criteria: Including thyroid dysfunction, hyperprolactinemia, non-classical congenital adrenal hyperplasia, and physiological conditions such as pregnancy that may lead to symptoms similar to PMOS. Other diseases, such as Cushing's syndrome, acromegaly, hypogonadotropic hypogonadism, or androgen-secreting tumors, especially if the female is taking medications that are known to interfere with the menstrual cycle or if there are signs of rapid symptom onset or significant virilization (muscularity) were also among the exclusion criteria. Medical history, physical examination and laboratory investigations were used to rule out these diseases.

Analysis of biochemical parameters: Participants had a six milliliters (mL) blood sample taken from a peripheral vein, which was allowed to clot for 15 minutes, and then centrifuged for ten minutes at 3000 rpm. Before analysis, the serum of 1.5 mL was flouded in Eppendorf tubes and kept at -20 °C. The serum levels of NEP, Corin, insulin, FBG, total testosterone, and SHBG were measured through laboratory testing. The enzyme linked immunosorbent assay (ELISA), which is based on the sandwich principle and captures the target antigen between two layers of antibodies, was used to evaluate NEP, Corin, insulin, total testosterone, and SHBG. This, in accordance with the manufacturer's instructions, entails competition between the target analyte and a tagged analog for scarce antibody binding sites (Elabscience Company, Houston, Texas, USA). FBG was measured using a spectrophotometric route, which consists of a broadband light source, an optical circulator to guide light to the sensor FBG, and a spectrometer or photodetector (PD) with an edge filter to determine the Bragg wavelength of the reflected light. The spectrometer detector measures the shift in the reflected wavelength caused by changes in the external physical parameter.

Calculation of The Homeostatic Model Assessment for Insulin Resistance (HOMA-IR) and free androgen index (FAI): The study applied an equation for calculation of HOMA-IR = [Fasting Glucose (mmol/L) x Fasting Insulin (μU/ml)] / 22.5 (16).

The free androgen index (FAI) is calculated with the equation:

FAI = (Total Testosterone/ Sex Hormone-Binding Globulin [SHBG]) x 100 (17).

This calculation provides an estimate of the physiologically active androgens, as SHBG is a protein that binds testosterone, making it biologically inactive.

Statistical analysis: Microsoft Excel was used to arrange the data, while SPSS version 26.0 was used for analysis. The data was not normally distributed according to Shapiro Wilk Test that applied to indicate the normality, the medians and interquartile range (IQR) were used to describe the data. The Mann–Whitney U test was used to compare independent variables (age, BMI, Corin, FBG, NEP, SHBG, HOMA-IR, FAI, insulin, and total testosterone between control and PMOS group. The medians of the five groups were compared using the Kruskal-Wallis test, and significant subgroups were then compared using the Dunn's test from STATA version 17 (18). To evaluate the correlation between numerical variables, Pearson test was used. A statistically significant P-value was defined as less than 0.05. The potential prediction of each parameter for distinguishing the PMOS phenotype was assessed using receiver operating characteristic (ROC) curves and matching area under curve (AUC) values. Multiple linear regression test was used to examine the relationships between multiple predictors and one outcome**.**

Results

Demographic characteristics: Table 1 shows the median + inter-quartile range (IQR) values for age and BMI. These characteristics were relatively homogeneous across the groups. The IQR for age was 19.7- 29.2 years for controls and 22.0 - 32.0 years for PMOS, which was not statistically significant (P-value = 0.071) between the study groups. BMI showed a statistically significant increase in PMOS groups (28.0) kg/m^2 when compared to the control (25.8) kg/m^2, (P-value = 0.003).

Table 1: Median and Inter-quartile range for age and BMI among the study groups

Parameters	Central tendency & dispersion	Control N=50	PMOS N=100	p-value
Age (year)	Median Inter quartile range	25.5 19.7 – 29.2	26.0 22.0 – 32.0	0.071#
BMI Kg/m^2	Median Inter quartile range	25.8 24.5 – 28.1	28.0 27.0 – 29.8	0.003*

Mann–Whitney U test was used to compare the two groups
* A significant difference between study groups, # A non-significant difference between study groups

Evaluation of biochemical parameters: Table 2 compares blood glucose parameters such as FBG, insulin, and HOMA-IR. The median values in the PMOS group (5.0; 9.8; 2.1) respectively were significantly higher than those in the control group (4.45; 4.3; 0.9) (p = 0.003; < 0.001). The table also shows that the median values of total testosterone and free androgen index (FAI) in the PMOS group were (0.401; 1.4), respectively, significantly higher than those in the control group (0.138; 0.3), respectively, (p < 0.001). Although the results showed that the median SHBG value in the PMOS group (27.0) was significantly lower than that in the control group (43.0) (p < 0.001), the decrease in SHBG mainly occurred in overweight or obese patients. The table shows that the median value of NEP in the PMOS group (1053.9) was significantly higher than that in the control group (477.1) (p < 0.001), while the median value of Corin in the PMOS group (1.3) was significantly lower than that in the control group (6.2) (p < 0.001).

Table 2: Median and Inter quartile range for FBG, HOMA-IR, Corin, SHBG, FAI, Insulin, NEP, and total testosterone in the study groups

Parameters	Central tendency & dispersion	Control N= 50	PMOS N=100	P value
Corin ng/mL	Median	6.2	1.3	<0.001*
	Inter Quartile range	5.3 - 7.2	1.1 - 1.5	
FBG (mmol/L)	Median	4.45	5.0	0.003*
	Inter Quartile range	3.9 - 5.2	4.5-5.5	
HOMA-IR	Median	0.9	2.1	<0.001*
	Inter Quartile range	0.7-1.22	1.8-2.7	
SHBG (nmol/mL)	Median	43.0	27.0	<0.001*
	Inter Quartile range	37.26-46.55	21-35.22	
FAI %	Median	0.3	1.4	<0.001*
	Inter Quartile range	0.3-0.42	1.0-1.9	
Insulin (µIU/ml)	Median	4.3	9.8	<0.001*
	Inter Quartile range	3.8-5.12	8.3 - 12.7	
NEP pg/mL	Median	477.1	1053.9	<0.001*
	Inter Quartile range	458.9-514.6	1007.6-1082.4	
T. Testosterone (nmol/L)	Median	0.138	0.401	<0.001*
	Inter Quartile range	0.116 – 0.207	0.333 – 0.430	

The Mann–Whitney U test was used to compare the two groups. * A significant difference between the study groups.

Comparison of biochemical parameters among groups: Table 3 shows multiple comparisons between study groups. All parameters indicate a highly significant P-value <0.001 when compared to group E (control), with the exception of FBG. FAI shows a significant difference between group A and group D (P <0.05). Total testosterone showed a variation among study groups, with a significantly lower value in group D compared to group A and B (P <0.05).

Table 3: Multiple comparisons of Median and interquartile range for FBG, HOMA-IR, NEP, SHBG, FAI, Insulin, Corin, and total testosterone among study groups

Parameters	Tendency dispersion	Group A N=61	Group B N=15	Group C N=14	Group D N=10	Group E N=50	P value
FAI %	Median	1.9	2.1	1.6	1.4[a]	0.425[a,b,c,d]	<0.001*
	IQR	1.4-2.14	1.3-2.7	1.4-2.0	0.9-2.0	3.87-4.12	
FBG (mmol/L)	Median	5.0	4.9	5.2	4.9	4.45	0.0574#
	IQR	4.5-5.6	4.7-5.5	4.2-6.1	4.4-5.0	3.9-5.2	
HOMA-IR	Median	2.2	2.0	2.2	1.9	0.9 [a,b,c,d]	<0.001*
	IQR	1.9-2.7	1.6-3.0	1.8-2.7	1.6-2.6	0.7-1.2	
Insulin (µIU/ml)	Median	10.3	9.15	9.28	8.95	4.34 [a,b,c,d]	<0.001*
	IQR	8.3-12.8	8.0-13.1	7.9-12.2	8.5-12.9	3.8-5.1	
SHBG (nmol/l)	Median	25.9	30.5	28.4	31.6	43.0 [a,b,c,d]	<0.001*
	IQR	21.0-34.5	19.8-40.0	20.9-33.6	22.2-35.0	37.6-47.5	
T testosterone (nmol/L)	Median	0.40	0.41	0.35	0.26 [a,b]	0.138 [a,b,c,d]	<0.001*
	IQR	0.334-0.430	0.399-0.433	0.33-0.40	0.23-0.34	0.11-0.20	
Corin ng/mL	Median	1.3	1.2	1.3	1.2	6.2 [a,b,c,d]	<0.001*
	IQR	1-1.5	1.1-1.8	1.1-1.5	0.9-1.4	5.3-7.2	
Neprilysin pg/mL	Median IQR	1054.3 998.3-1088.1	1051.6 1027.6-1065.9	1050.2 967.0-1065.7	1058.7 1010.9-1169.6	477.1 [a,b,c,d] 458.9-514.6	<0.001*

**** A significant difference between study groups, # A non-significant difference between study groups***
(a) A sig difference in group A, (b) A sig difference in group B, (c) A sig difference in group C, (d) A sig difference in group D. Kruskal Willi test and Dunns' test as post-hoc test were used. Different superscript letters (a, b, c, d) indicate significant differences between groups (p < 0.05) in post-hoc analysis.

Correlations between variables: Table 4 and figures 1, 2, 3 showed a significant positive correlation between serum NEP in PMOS groups and each of insulin (P=0.027), total testosterone (P=0.006), and HOMA-IR (P=0.023) respectively.

Table (4): Spearman correlation between the study parameters in PMOS groups

parameters	Neprilysin	
	Correlation (r)	p-value
HOMA-IR	0.228	0.023*
Insulin	0.222	0.027*
Total Testosterone	0.272	0.006*

**** A significant correlation between variables***

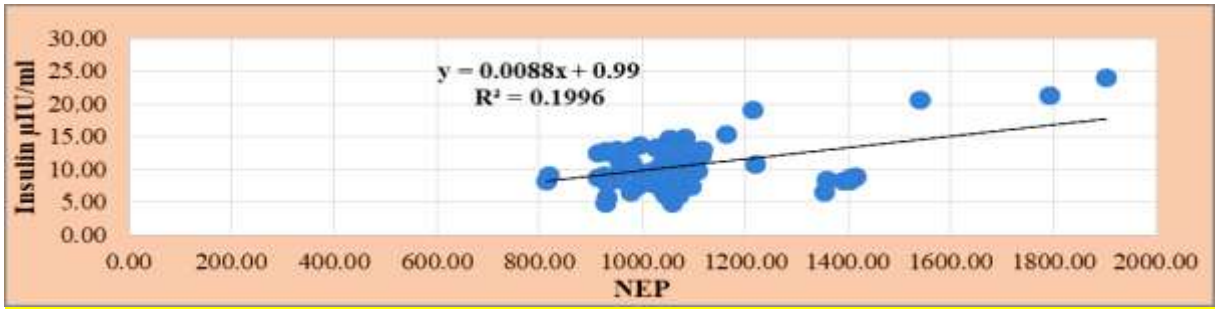

Figure (1): The correlation of NEP with insulin in PMOS groups

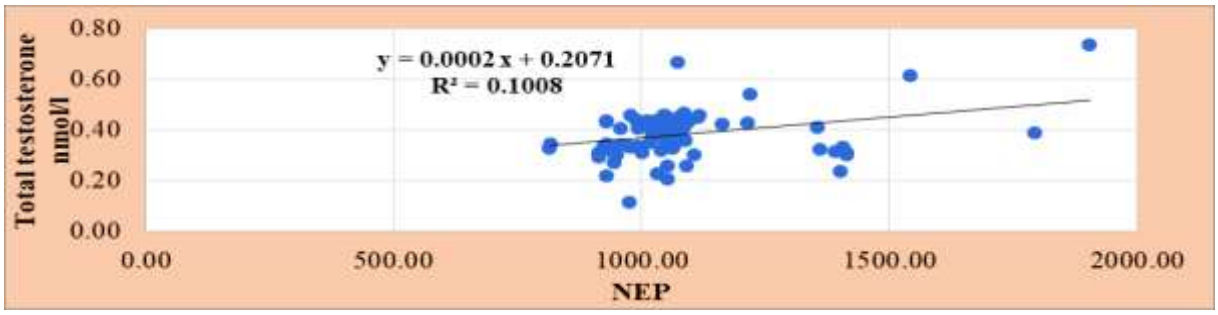

Figure (2): The correlation of NEP with Total testosterone in PMOS groups

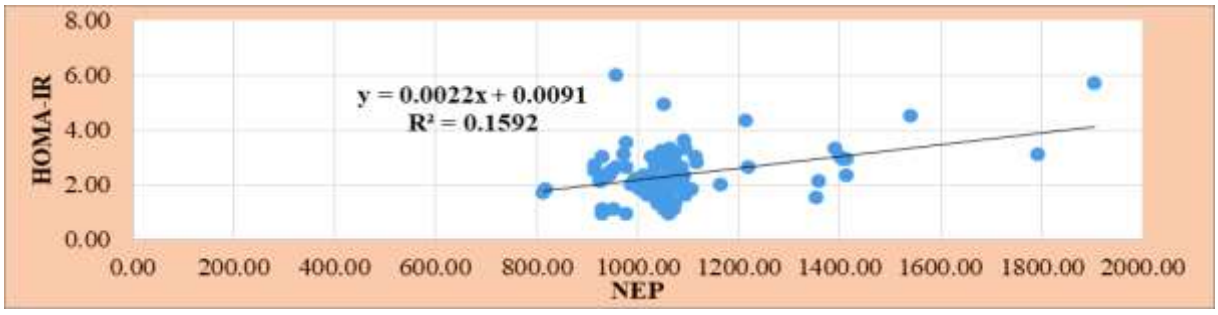

Figure (3): The correlation of NEP with HOMA-IR in PMOS groups

Receiver Operating Characteristic Curve (ROC) and area Under The Curve (AUC) analysis:
Serum NEP showed a remarkable diagnostic value with an AUC of 1 (95% Confidence Interval (CI): 0.999 to 1.000) for distinguishing PMOS from the control group (Figure 4). With an optimal cutoff value of > 885.25 (pg/mL), serum NEP showed perfect specificity (100%) and excellent sensitivity (98%). With an AUC of 0.99 (95% CI: 0.997–1.000), 99% sensitivity and 100% specificity, serum Corin levels more than 3.15 ng/ml demonstrated good diagnostic performance. These findings highlight the important diagnostic use of both markers for identifying PMOS patients, as seen in Table 5 and Figure 5. In contrast, insulin had a strong AUC of 0.907 with 98% sensitivity and 78% specificity in the diagnosis of PMOS patients, whereas total testosterone ROC and AUC analysis revealed 0.947 with 92% sensitivity and specificity.

Table (5): Sensitivity, specificity and cutoff value for parameters in ROC curve

parameters	AUC	Std. Error	P-value	Sensitivity	Specificity	Cut -off	Asymptotic 95% Confidence Interval	
							Lower Bound	Upper Bound
Neprilysin	1.0	0.001	<0.001	98	100	885.25	0.999	1
Insulin	0.907	0.029	<0.001	98	78	5.38	0.850	0.965
Corin	0.99	0.001	<0.001	99	100	3.15	0.997	1
SHBG	0.880	0.028	<0.001	79	82	36.4	0.825	0.934
T. testosterone	0.947	0.022	<0.001	92	92	0.290	0.903	0.990

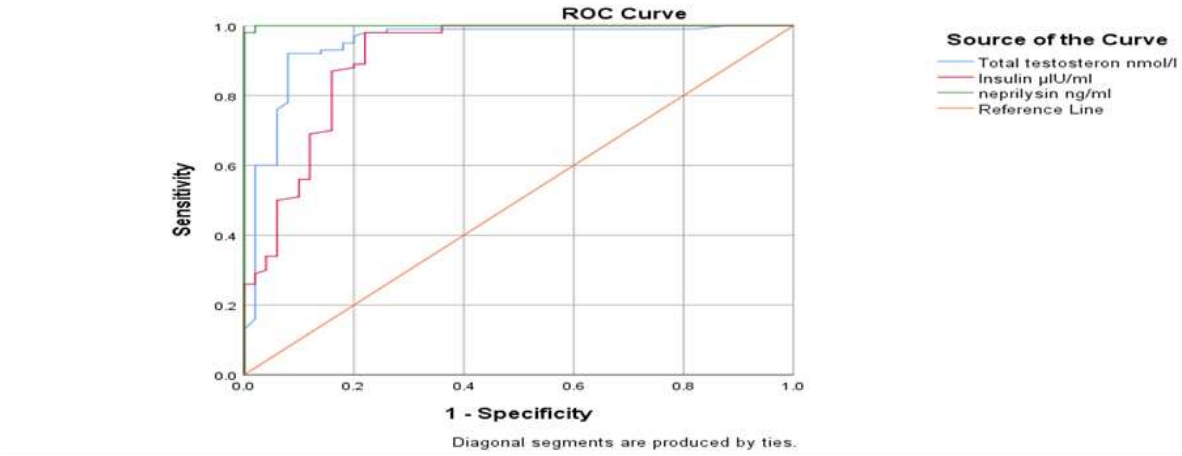

Figure (4): ROC curve for Total testosterone, Insulin, and Neprilysin in the study groups

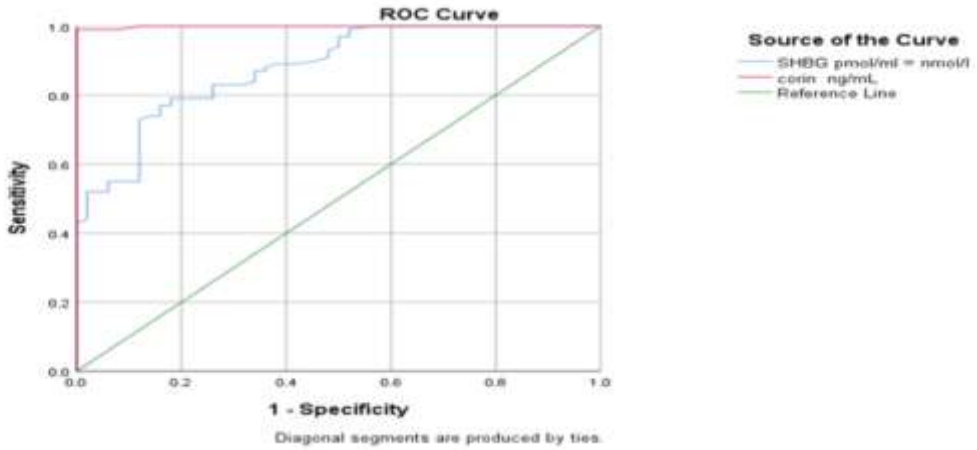

Figure (5): ROC curve for Corin, and Sex Hormone Binding Globulin in the study groups

Multiple linear regression of the study parameters: Table 6 shows the linear regression model, with insulin levels most strongly predicted by FBG (negative effect) and HOMA-IR (positive effect). NEP also showed a smaller but significant positive effect. Other hormonal and body composition measures (Corin, SHBG, testosterone, FAI, BMI) did not show significant correlations.

Table 6: Multiple linear regression for PMOS **patients with correlation statistics**

Predictor	Coefficient (β)	Std. Error	t-Statistics	P-Value
Intercept (insulin) #	5.753	4.316	1.333	0.186
Neprilysin*	0.006	0.002	2.808	0.006 **
Corin*	-0.052-	0.155	-.332-	0.741
SHBG*	-0.145	0.095	-1.527	0.130
Total testosterone*	4.686	7.667	0.611	0.543
FAI*	-0.469	1.794	-0.261	0.795
BMI*	-0.009	0.033	-0.266	0.791
FBG*	-1.934-	0.073	-26.540-	0.000 **
HOMA-IR*	4.329	0.139	31.221	0.000 **

**** Factors represent independent variables. # Intercept or constant (dependent) variable.***
***** A significant correlation with P-value <0.05.***

Discussion

This study establishes that PMOS patients have higher levels of Neprilysin (NEP) than the control group. The findings that excess body weight in women with PMOS could stimulate the development of diabetes by aggravating both IR and a compensatory increased insulin production, which may lead to PMOS, appear to be consistent with our results, which showed significantly higher plasma insulin levels and HOMA-IR values in patients with PMOS, when compared with the controls (19). Owing to the possible involvement of NEPs in glucose metabolism, correlations between their levels and metrics including hyperinsulinemia, glycaemia and changes in insulin sensitivity have been studied in individuals with type 2 diabetes. Li et al, showed a favorable correlation between blood NEP levels and blood glucose, insulin, HOMA-IR and the duration of diabetes (20). Despite the fact that the current study focused on PMOS patients, the approach in the marker findings was consistent with the current study, which found a substantial positive relationship between serum NEP levels and both insulin and HOMA-IR. Both elevated testosterone and NEP are involved in inflammatory processes within the body and ovaries, which may link them. High insulin levels in PMOS frequently cause a significant rise in testosterone and NEP levels in the same syndrome, due to insulin resistance (21). The high levels of testosterone are already associated with low levels of SHBG in overweight PMOS; this line agrees with the present study, which tends to increase the bioavailability of free testosterone by FAI, a hallmark of PMOS complications. IR also acts directly on the liver to decrease SHBG production. Therefore, low SHBG is the main biomarker for metabolic dysfunction related to IR and PMOS, particularly in overweight individuals (22).

Corin is a protein that has a pivotal role in many organs. The present study showed that Corin levels in the PMOS group are significantly lower than in the control group. The main roles of Corin in the uterus are to maintain normal blood pressure, encourage trophoblast invasion and change the path of the uterine spiral artery. When Corin production is disrupted, the first product of Corin, the natriuretic peptide, is reduced, which may increase the risk of insulin resistance. The renin-angiotensin system is triggered by low ANP activity. As a result, it starts the process of insulin resistance by blocking the intracellular insulin signaling, raising inflammation and oxidative stress and decreasing blood supply to the pancreas and skeletal muscles (23). Any alterations in the Corin enzyme induce dysregulation and malfunction, particularly in the uterus prior to and during pregnancy, which results in further difficulties including preeclampsia (24). Numerous illnesses have had their circulating Corin levels evaluated. Osteoporosis has been linked to lower levels of Corin, whereas preeclampsia, hypertension, obesity, and hyperglycemia have all been linked to higher amounts. Nevertheless, it is still unknown what processes underlie these alterations in different illnesses. Changes in Corin levels were indicative of a new comorbidity-related mechanism (14). The present study is consistent with a recent report that observed lower Corin levels in women with PMOS, compared to controls, although the difference did not reach statistical significance (25). Notably, that study measured Corin in follicular fluid, whereas this investigation assessed the circulating serum Corin level. However, our findings disagree with Ibrahem et al, study in Egypt, which reported elevated Corin levels in PMOS patients (14). Along with other hormonal and metabolic markers, the current study examines the diagnostic and prognostic utility of Corin and NEP in various PMOS presentations. Our results show significant differences between biomarkers that maintain independent predictive capacity in regression modelling and those that show excellent discriminatory ability in ROC analysis.

Limitations: The small sample size as well as the difficulty in identifying specific subtypes of PMOS patients with normal androgen levels (type D) made diagnosis challenging as they often presented with mild clinical symptoms.

Conclusion: Corin and NEP have remarkable diagnostic accuracy in differentiating between various PMOS presentations. With nearly ideal AUC values and extremely high sensitivity and specificity, both biomarkers demonstrated their potential utility for clinical assessment. Corin and NEP consistently executed a better diagnostic performance, as compared to other markers like insulin, SHBG and total testosterone, showing that they could be better indicators for disease assessment.

Authors' declaration:

We confirm that all the Figures and Tables in the manuscript belong to the current study. Besides, the figures and images, which do not belong to the current study, have been given permission for republication attached to the manuscript. The approval of ethical considerations is signed by the authors. Ethical Approval: On 6/2/ 2025, the Baghdad Teaching Hospital and Educational Laboratories local ethics committee accepted the project under code number (122).

Conflict of Insert: None

Funding: No financial support or grant was received for conducting this study.

AI Declaration: No artificial intelligence tools were used in the design, analysis, or writing of this manuscript.

Authors' contributions:

Study conception & design: (Hedef D. El-Yassin). Literature search: (Mothana F. Hasan). Data acquisition: (Afraa M. Al-Naddawi, Mothana F. Hasan). Data analysis & interpretation: (Mothana F. Hasan, Hedef D. El-Yassin). Manuscript preparation: (Mothana F. Hasan). Manuscript editing & review: (Hedef D. El-Yassin).

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تقييم الكورين والنبريلايسين في حالات متنوعة من متلازمة المبيض الأيضية متعددة الغدد الصماء

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الخلاصة:
الخلفية:
متلازمة المبيض الأيضية متعددة الغدد الصماء هي مرض غدد صماء شائع للغاية يصيب النساء في سن الإنجاب. يعد كل من الكورين والنبريلايسين مؤشرين حيويين حديثين مرتبطين بالمتغيرات الأيضية لمتلازمة المبيض الأيضية متعددة الغدد الصماء. وكلاهما إنزيمان يشاركان في آليات تنظيم استقلاب الأنسجة الدهنية.
الاهداف: تقييم القيمة السريرية والتشخيصية للكورين والنبريلايسين في مختلف المظاهر السريرية لمتلازمة المبيض الأيضية متعددة الغدد الصماء ، مع التركيز على وظائفهما المحتملة كمؤشرات حيوية لتصنيف المرض وتحديده.
المنهجية: تضمنت الدراسة المقارنة بين الحالات المرضية والاصحاء على 150 امرأة تتراوح أعمارهن بين (18-41) عاما في مستشفى بغداد التعليمي، محافظة بغداد، العراق، من شهر فبراير الى سبتمبر 2025. وشملت الدراسة 50 امرأة سليمة في سن الإنجاب كمجموعة ضابطة، و100 امرأة مصابة بمتلازمة المبيض الأيضية متعددة الغدد الصماء ، تم تقسيمهن إلى أربع مجموعات فرعية بناء على النمط الظاهري للمرض الى: 61 أمرأة مصابة ذات أندروجين عالي، و15 أمرأة مصابة ذات علامات سليمة بجهاز السونار، و14 أمرأة مصابة ذات دورة حيض طبيعية، و10 نساء مصابات ذوات مستوى طبيعي من الأندروجين. استخدمت طريقة قياس المطياف الضوئي لتقييم مستوى سكر الدم الصائم. أما العوامل الأخرى ك (الأنسولين، والنيبريلايسين، والكورين، البروتين الرابط للهرمونات الجنسية، والتستوستيرون الكلي) فقد تم اختبارها بتقنية ELISA.
النتائج: أظهرت النتائج ارتفاعا ملحوظا في متوسط مستوى النبريلايسين لدى جميع مجموعات متلازمة المبيض الأيضية متعددة الغدد الصماء مقارنة بالمجموعة الضابطة ($p<0.001$). مع ذلك، لم تلاحظ فروق ذات دلالة إحصائية بين المجموعات الفرعية لمتلازمة المبيض الأيضية متعددة الغدد الصماء. كما لوحظ انخفاض ملحوظ في مستويات الكورين في مصل الدم لدى مجموعات متلازمة المبيض الأيضية متعددة الغدد الصماء عند مقارنتها بالمجموعة الضابطة ($p<0.001$). ولكن لم تلاحظ أي فروق ذات دلالة إحصائية بين المجموعات الفرعية لمتلازمة المبيض الأيضية متعددة الغدد الصماء. وجد ارتباط إيجابي ذو دلالة إحصائية بين النبريلايسين وكل من (الأنسولين P=0.027، والتستوستيرون الكلي P=0.001), ومؤشر مقاومة الأنسولين P=0.006) تتابعيا.
الاستنتاج: تظهر هذه الدراسة أن الكورين والنبريلايسين هما مؤشران حيويان واعدان لتحسين تشخيص وتصنيف الأنماط الظاهرية الوظيفية لمتلازمة المبيض الأيضية متعددة الغدد الصماء ، مما يوفر رؤى قيمة حول الأساليب الشخصية لإدارة المرضى واتجاهات البحث المستقبلية.
مفتاح الكلمات: نيبريلايسين؛ كورين؛ فرط الأندروجين؛ متلازمة المبيض الأيضية متعددة الغدد الصماء.