

Diagnostic Value of Anti-Müllerian Hormone Level in Adolescent Females with Polycystic Ovarian Syndrome

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INTRODUCTION

- In adolescence, diagnosis of polycystic ovary syndrome (PCOS) is challenging because characteristics of normal puberty often overlap with signs and symptoms of PCOS.
- Anti-Müllerian hormone (AMH) is one of the important biomarkers suggested to confirm the diagnosis of PCOS and to manage the treatment process in adolescence.

OBJECTIVES

- Evaluation of the diagnostic role of AMH for PCOS in adolescent females
- Study of association of AMH to other diagnostic criteria of PCOS

SUBJECTS AND METHODS

Design: Cross sectional study

Patients: 30 PCOS aged 15-19 years (having all three of the Rotterdam Criteria: abnormal uterine bleeding indicative of chronic anovulation, clinical or laboratory hyperandrogenism, and a typical polycystic appearance of the ovaries on ultrasonographic examination), 30 high risk patients (incomplete PCOS with 2 of the 3 criteria), and 30 age and sex-matched controls.

Inclusion Criteria:

- Group 1: thirty adolescent females already diagnosed as having PCOS according to Rotterdam criteria (2 or more of 3 criteria will be included as follows:
 - Oligomenorrhoea (cycle interval > 45 days) or amenorrhoea (absent menses > 90 days).
 - Evidence of clinical (hirsutism, acne) and/or biochemical hyperandrogenism.
 - Polycystic ovaries > 10 follicles with a diameter of at least 2-9mm and ovarian volume > 10cm³ by pelvic ultrasound
- Group 2: thirty adolescent female patients presenting with hirsutism menstrual irregularities but who did not meet the laboratory and U/S confirmation of PCOS.
- Group 3: thirty normal healthy control adolescent females, age matched.

Exclusion Criteria:

- Chronic illness or other endocrine or genetic disorder causing hirsutism
- Patients taking medications that might potentially influence the biomedical assessments, e.g. oral contraceptive pills, metformin, anti-androgens

Methods:

- The study's participants were recruited from the Obstetrics and Gynecology department of Cairo University Teaching Hospital and the Diabetes Endocrine and Metabolism Pediatric unit (DEMPU) of Children Hospital of Cairo University.
- History taking and Clinical examination including Acne and hirsutism scoring
- Hirsutism was classified in terms of the distribution and degree of hair growth through Ferriman-Gallwey scale. The severity of acne was categorized as mild, moderate, or severe according to the classification system suggested by Luckey et al., 1997

- Blood samples for hormonal assay were collected 5 days after menstruation. AMH, FSH, LH, prolactin, testosterone, estrogen, 17 hydroxy-progesterone
- A single trans-vaginal ultrasound scan was performed at a random time (during the menstrual cycles) in the included married females. The number of follicles larger than 2.0 mm in each ovary was noted. The ovarian volume (cm³) was calculated by the formula length (centimeters) × width (centimeters) × height (centimeters) × 0.523. The results of these sonographic examinations were used to determine whether the patient fulfilled the criteria of having polycystic ovaries (PCO). The average ovarian volume was calculated summing the volumes of both ovaries and divided them by 2.

RESULTS

- Mean serum AMH was 10.7±5 ng/ml in PCOS patients, 22±15 ng/ml in high risk group and 10±5 ng/ml in controls.
- There was no statistically significant difference in serum AMH levels between PCOS patients and controls.

Comparison of abnormal laboratory data between PCOS group (n=30), high risk group (n=30)

Variables		PCOS no. (%)	High risk no. (%)	P value
Serum AMH	High	27 (90)	30 (100)	0.16
	Low	1 (3.3)	3 (10)	0.61
Serum FSH	High	8 (26.7)	4 (13.3)	0.33
Serum LH	High	1 (3.3)	2 (6.7)	1.00
Serum Prolactin	High	11 (36.7)	2 (6.7)	0.01*
Serum Free Testosterone	Low	30 (100)	22 (73.3)	0.005*
Serum 17 OHP	High	25 (83.3)	29 (96.7)	0.2
	Low	3 (10)	3 (10)	0.60
Serum DHEAS	High	0 (0)	1 (3.3)	0.60
Serum Estradiol	High	17 (56.7)	27 (90)	0.007*
Biochemical hyperandrogenism	-	30 (100)	30 (100)	0<0.0001*

*Chi-square test.

AMH: anti-müllerian hormone, FSH: Follicle stimulating hormone, LH: Luteinizing hormone, TSH: thyroid-stimulating hormone, 17OHP: 17hydroxy progesterone, DHEAS: dehydroepiandrosterone sulfate,

CONCLUSION

In this study, the serum AMH levels were found to be similar in the PCOS groups and the controls group. During adolescence, especially at an early post-menarcheal age, the use of AMH levels as a diagnostic tool for PCOS is still controversial and more studies on this topic are needed.

