PCOS presentation in girls with a history of premature adrenarche does not differ from those without premature adrenarche

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Background

- Polycystic Ovary Syndrome (PCOS) is a common endocrine disorder affecting 6-10% of reproductive-aged and >15% of women with obesity.
- Adolescents with PCOS have a significantly higher risk of developing metabolic syndrome compared to their peers.
- Recent studies suggest that premature adrenarche (PA), a condition originally thought to represent a benign deviation of the pubertal process, may be considered a prodromal stage in the development of PCOS.
- Various studies have reviewed biological characteristics of girls with PA, including the later development of metabolic and endocrine disorders including PCOS.
- Few studies describe the physical, hormonal, and metabolic characteristics of girls with PA at the time of their PCOS diagnosis compared to peers with normal pubertal development prior to PCOS diagnosis.

Objective

To compare the physical, hormonal, and metabolic characteristics of adolescent girls with PA at the time of their PCOS diagnosis to similarly-aged girls who had a history of normal pubertal development at the time of their PCOS diagnosis.

Methods

- Retrospective chart review of electronic medical records at a pediatric tertiary care hospital and affiliated community practices.
- Initial PA+PCOS cohort identified by ICD 9/10 codes for "premature adrenarche," "premature puberty," and "PCOS," in girls diagnosed with PCOS between Jan. 2012–Sept. 2020.
- The comparative group (PCOS without PA) was selected from the Children's Hospital Colorado PCOS Database.
- All had obesity (BMI ≥ 95th percentile) at PCOS dx.
- Descriptive statistics and t-tests or Wilcoxon rank tests were used to compare groups. Adjustments for race/ethnicity and age were applied.

Results

Table 1. Demographic Data

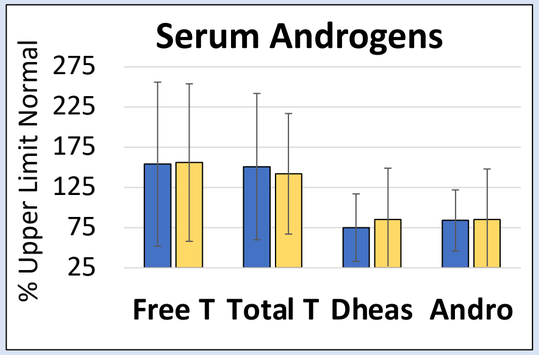
	PA + PCOS (N = 22)	PCOS (N = 66)
Age at PCOS diagnosis (years)	14.9±1.4	15.7±1.6
African American	13.6%	17.6%
Hispanic	27.3%	42.6%
Asian	0%	2.9%
Non-Hispanic white	59%	36.8%

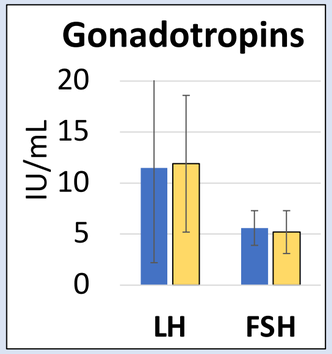
Table 2. Characteristics of Cohorts

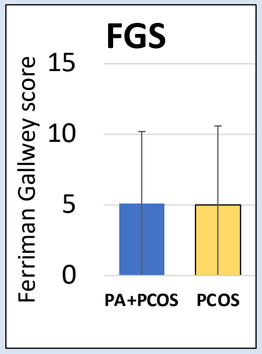
	PA + PCOS (N = 22)	PCOS (N = 66)	P Value
BMI (kg/m^2)	31.5±8.0	31.4±8.6	0.99
Age of menarche (years)	11.8±1.7	11.8±1.8	0.97
Age at PCOS diagnosis (years)	14.9±1.4	15.7±1.6	0.87
Maternal history of PCOS	18.2%	4.2%	0.03
Family history of type 2 diabetes	31.8%	56.9%	0.04

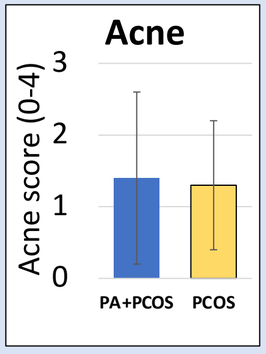
No differences in serum androgens, gonadotropins or clinical hyperandrogenism between the groups.
p > 0.05 for all

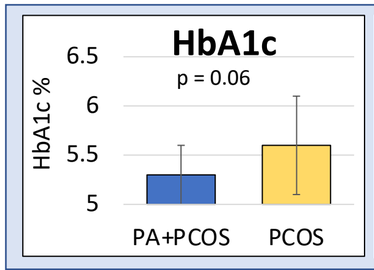
PA+PCOS
PCOS

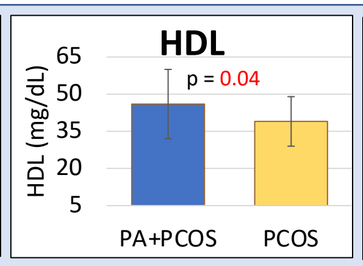


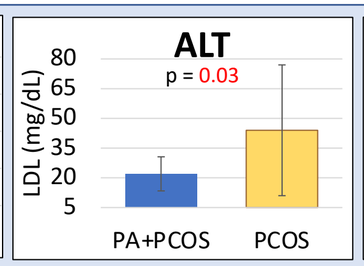


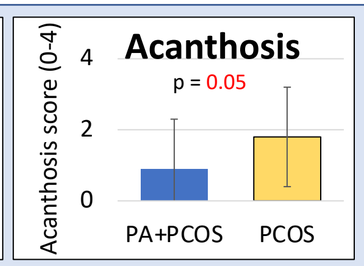












Metabolic labs and acanthosis are worse in PCOS compared to PA + PCOS.

Conclusions

1) Biochemical and physical androgen profile is not different with PA + PCOS.
2) PCOS with normal puberty may have a metabolic phenotype with higher family history of T2D and worse acanthosis.
3) Girls with PA + PCOS are more likely to have a maternal history of PCOS.

Future Directions

Study a larger, more diverse cohort of adolescents to determine if differences in metabolic risk factors are due to a biological difference, or earlier engagement with endocrinology and obesity management strategies.