

# Differences between normal-BMI girls with Premature Adrenarche and overweight or obese girls with Premature Adrenarche

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## OBJECTIVES

Premature adrenarche (PA): clinical signs of androgen action + DHEAS  $\geq 40$   $\mu\text{g/dl}$ , before age 8 in girls and 9 in boys, without breast or testicular enlargement

Aim: to characterize a population of prepubertal girls with PA and to compare girls with a normal BMI with girls who are overweight or obese, in what regards gestational age and birth weight, age at the referral, clinical signs, anthropometry, bone age and hormone profile

## METHODS

- Cross sectional study of 83 Caucasian prepubertal girls (mean age of  $7.2 \pm 1.2$  years) followed in the Pediatric Endocrinology outpatient clinic of a university hospital in Portugal because of PA
- Data regarding gestational age and birth weight were collected from the child's health card. Parents' height and maternal age at menarche were self-reported
- All subjects included in the study underwent: anthropometric and clinic evaluation; bone age evaluation (Greulich Pyle comparative method); blood collection for DHEAS, androstenedione, total testosterone and 17-hydroxyprogesterone
- Girls were then divided in two groups, according to their BMI SD (WHO criteria): 1) normal BMI (BMI  $\leq +1$  SD) (n=33); 2) overweight/obese (BMI  $>1$ SD) (n=50)

## RESULTS

	Normal BMI (BMI $\leq +1$ SD) (n=33)	Overweight/obese (BMI $>1$ SD) (n=50)	p
Gestational age (weeks) (mean; SD)	38 $\pm$ 3	38 $\pm$ 2	0.322*
<b>Birth weight (g) (mean; SD)</b>	<b>2707<math>\pm</math>834</b>	<b>3075<math>\pm</math>545</b>	<b>0.024*</b>
<b>Birth weight (SD)</b>	<b>-0.64<math>\pm</math>1.0</b>	<b>-0.05<math>\pm</math>0.8</b>	<b>0.005*</b>
Mother age at menarche (years) (mean; SD)	12 $\pm$ 1	11.5 $\pm$ 2	0.171*
Age at pubarche	5.6 $\pm$ 1	5.9 $\pm$ 1	0.165*
Age at evaluation	6.9 $\pm$ 1	7.5 $\pm$ 1	0.062*
<b>Height SD (mean; SD)</b>	<b>0.4<math>\pm</math>1</b>	<b>1.3<math>\pm</math>1</b>	<b>0.008*</b>
Growth velocity SD (mean; SD)	1.5 $\pm$ 2	1.4 $\pm$ 3	0.943*
Bone age – Chronological age (mean; SD)	1 $\pm$ 1	0.9 $\pm$ 0.9	0.642*
DHEAS ( $\mu\text{g/dL}$ ) (median; IQR)	97 (45-130)	111 (80-145)	0.131†
Androstenedione (ng/mL) (median; IQR)	0.05 (0-0.5)	0.6 (0-1)	0.063†
<b>17OHP (ng/mL) (median; IQR)</b>	<b>1 (0.7-1.3)</b>	<b>1.1 (1-1.9)</b>	<b>0.041†</b>
<b>Total testosterone (ng/mL) (median; IQR)</b>	<b>0 (0-0)</b>	<b>0.045 (0-0.13)</b>	<b>0.015†</b>

Birth weight SD – Fenton growth charts; Height SD – WHO growth charts; Growth velocity SD – Tanner height velocity charts; Bone age – Greulich and Pyle comparative method  
† Mann Whitney U Test; \* Independent Samples T Test

## CONCLUSIONS

In our cohort, mean birth weight was in the 50<sup>th</sup> percentile and no relationship between PA and intrauterine growth restriction was found. When compared with their normal-BMI PA peers, PA girls that are overweight or obese at prepuberty present higher levels of total testosterone and 17-hydroxyprogesterone. Therefore, in this particular group of girls with PA, there is an adrenal hyperfunction that seems to be more expressive in overweight and obese children. The extent to which higher levels of androgens (mainly DHEAS) in prepubertal

