Ultrasensitive estrogen levels at 7 years of age predict earlier thelarche: evidence from girls of the growth and obesity Chilean cohort

Por: Pereira, A (Pereira, Ana)\(^1\); Corvalan, C (Corvalan, Camila)\(^1\); Uauy, R (Uauy, Ricardo)\(^1,2\); Klein, KO (Klein, Karen O.)\(^3\); Mericq, V (Mericq, Veronica)\(^4\)

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Resumen

Objective: Prepubertal estradiol equivalents have been inconsistently linked to age at thelarche; elucidating this relationship becomes relevant given the worldwide decline in the age of puberty onset. Thus, our aim is to assess whether prepubertal girls with higher serum levels of estradiol equivalents at age 7 have a greater risk of presenting early thelarche (ET).

Design: Nested case-control study within the Growth and Obesity Cohort Study of 1196 low-middle income children (similar to 50% girls) from Santiago, Chile. Girls were defined as cases (ET; n=61) if breast bud appeared prior to 8 years of age; controls (n=91) had thelarche >8 years.

Methods: At 6.7 years, weight, height and waist circumference were measured and a fasting blood sample was obtained for measuring estrogen equivalent (ultrasensitive recombinant cell bioassay), DHEAS, leptin, insulin and IGF1. Beginning at 7 years old, Tanner staging was assessed prospectively twice a year and the appearance of breast bud was assessed by palpation.

Results: Mean serum estradiol-equivalent at 6.7 years was 3.9 +/- 3.6 pg/ml for cases and 3.6 +/- 2.3 pg/ml for controls. Girls with ET had a higher risk of presenting elevated estradiol-equivalent (> = 5 pg/ml) at 7 years (OR=2.05, 95% CI: 0.96-4.36) than controls that was borderline significant. However, after adjusting by BMI, insulin and IGF1 at age 7, the association between estradiol-equivalent and ET was significant (OR=2.29 (95% CI: 1.05-5.01)).

Conclusions: Chilean girls from low to middle socioeconomic status with ET exhibited double the risk of having high levels of estradiol-equivalent at 7 years than girls with a later age of thelarche. Whole-body adiposity and increased adrenal activity did not explain the observed prepubertal estrogen increase.
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