

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

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EUROPEAN JOURNAL OF ENDOCRINOLOGY

Volumen: 173

Número: 6

Páginas: 835-842

DOI: 10.1530/EJE-15-0327

Fecha de publicación: DEC 2015

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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.

Palabras clave

KeyWords Plus: ENDOCRINE-DISRUPTING CHEMICALS; RECOMBINANT CELL BIOASSAY; PRECOCIOUS PUBERTY; PREMATURE THELARCHE; ADOLESCENT GIRLS; HORMONE AGONIST; SECULAR TRENDS; BREAST-CANCER; BODY-FAT; CHILDREN

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Financiación

Entidad financiadora	Número de concesión
Program U-INICIA VID, University of Chile	U-Inicia11/18
Chilean Council for Science and Technology: FONDECYT Postdoctorado	3130532 1120326
World Cancer Research Fund	2010/245

[Ver texto de financiación](#)

Editorial

BIOSCIENTIFICA LTD, EURO HOUSE, 22 APEX COURT WOODLANDS, BRADLEY STOKE, BRISTOL BS32 4JT, ENGLAND

Categorías / Clasificación

Áreas de investigación: Endocrinology & Metabolism

Categorías de Web of Science: Endocrinology & Metabolism

Información del documento

Tipo de documento: Article

Idioma: English

Número de acceso: [WOS:000364159400016](#)

ID de PubMed: 26369578

ISSN: 0804-4643

eISSN: 1479-683X

Información de la revista

- Impact Factor: [Journal Citation Reports®](#)

Otra información

Número IDS: CV3KZ

Referencias citadas en la Colección principal de Web of Science: **37**