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ORIGINAL ARTICLE

The relationship between metabolic disorders and small for gestational age with idiopathic premature adrenarche☆

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KEYWORDS
Idiopathic premature adrenarche;
Overweight;
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Abstract
Background: There is still controversy on the relationship between idiopathic premature adrenarche (IPA) and a history of small for gestational age, as well as the concomitant presence of obesity and other metabolic disturbances. An attempt is made to study these potential associations in a cohort of girls with IPA from our hospital.
Patients and methods: A descriptive cross-sectional study was conducted that included girls with a diagnosis of IPA from the Paediatric Department of the *Fundación Jiménez Díaz* (Madrid, Spain) between January 2007 and May 2015. A record was made of family and personal history with perinatal data, as well as anthropometric data and biochemical values at the time of diagnosis.

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Results: Out of a total of 76 girls with IPA, 2.7% had a history of small for gestational age. When body mass index was analysed according to modified criteria of WHO 2007/Cole 2000, 11.8% were overweight, and 11.8% were obese at diagnosis. Using the criteria set by the Spanish Ministry of Health, 6.6% were overweight and 18.4% obese, with 21.2% of the girls being insulin resistance, and 13.95% having dyslipidaemia. None of them had hypertension. From a comparative analysis between normal and overweight and obesity IPA girls, the latter had significantly higher levels of triglycerides and insulin, a higher HOMA index, and lower levels of HDL cholesterol.
Conclusions: IPA girls included in the study do not have a higher prevalence of small for gestational age compared to the general population. Prevalence of overweight and obesity in girls with IPA is not higher than the prevalence in the normal population.

PALABRAS CLAVE
Adrenarquia prematura idiopática;
Sobrepeso;
Obesidad y pequeño para edad gestacional

Estudio de la asociación de adrenarquia prematura idiopática con la presencia de alteraciones metabólicas y con antecedente de pequeño para edad gestacional

Resumen
Introducción: Hasta la fecha hay datos contradictorios sobre la relación entre adrenarquia prematura idiopática (API) y el antecedente de pequeño para edad gestacional así como con la presencia de obesidad y otras alteraciones metabólicas. Es nuestra intención estudiar esa posible asociación en una cohorte de niñas con API de nuestro hospital.
Pacientes y métodos: Estudio descriptivo transversal que incluyó a niñas diagnosticadas de API en el servicio de Pediatría de la Fundación Jiménez Díaz entre enero de 2007 y mayo de 2015. Se recogieron datos sobre antecedentes familiares, antecedentes personales que incluían datos perinatales así como datos antropométricos y datos bioquímicos al diagnóstico.
Resultados: Del total de 76 niñas con API, un 2,7% presentaba antecedente de pequeño para edad gestacional. Utilizando la clasificación del índice de masa corporal según criterios modificados de OMS 2007/Cole 2000, un 11,8% tenían sobrepeso y un 11,8% obesidad al diagnóstico. Según los criterios del Ministerio de Sanidad, un 6,6% presentaban sobrepeso y un 18,4% obesidad. Un 21,2% evidenciaron insulinorresistencia y un 13,95% presentaban dislipidemia. Ninguna de las pacientes cumplía criterios de hipertensión arterial. En el análisis comparativo entre niñas con API que presentaban normopeso frente a las que tenían sobrepeso y obesidad, las segundas presentaban niveles significativamente más elevados de triglicéridos e insulina y más bajos de colesterol HDL.
Conclusiones: Las niñas con API estudiadas no presentan mayor porcentaje de pequeño para edad gestacional que la población general. La prevalencia de sobrepeso y obesidad entre las niñas con API no es superior a la de la población de su entorno.

Introduction

Premature adrenarche is defined as the development of pubic and/or axillary hair and/or adult-like apocrine odour before age 8 years in girls and 9 years in boys. Idiopathic premature adrenarche (IPA) is diagnosed after ruling out other causes of excessive androgen production, such as adrenocortical or gonadal sex hormone secreting tumours, late-onset congenital adrenal hyperplasia or exogenous sources of androgens.[1] Therefore, IPA is a diagnosis of exclusion.[1,2]

The exact prevalence of IPA in the general population is unknown,[3] but it is a fairly frequent reason for medical visits, with a female-to-male ratio of approximately 9:1.[4]

To date, studies have analysed potential associations of IPA with a history of small for gestational age (SGA) or the presence of obesity and various metabolic disorders.[1] A physiological hypothesis that attempts to explain the association between SGA and IPA proposes that malnutrition in the prenatal period may trigger a series of epigenetic changes that would alter the function of the adrenal gland after birth. To this, we need to add the potential impact of the rapidity of catch-up weight and height gain in the postnatal period.[2,5] This hypothesis has been evaluated in studies conducted in cohorts of Catalonian girls with metabolic disorders, a history of SGA and androgen excess in childhood.[6–9] Other studies have reported elevated serum levels of dehydroandrosterone sulfate (DHEA-S) during childhood and adolescence in girls with a history of SGA.[1] However, there is no conclusive evidence that a history of SGA may directly predispose to the development of IPA. This