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Case report

Precocious Pubarche in a 7-Year-Old Patient. A Case Report

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Abstract: We present the case of a 7-year and 9-month-old female patient who visited the Pediatric clinic due to the onset of pubarche at seven years and seven months of age. There is no observed increase in body odour, axillary hair growth, or mastodynia. The mother reports an acceleration in growth velocity over the past few months. The child maintains a proper diet, is physically active, and demonstrates good academic performance. Regarding her personal history, she was born from a controlled gestation and eutocic delivery induced at 39 weeks, with a birth weight of 2,960 kilograms and no neonatal complications. Endocrine-metabolic screening yielded negative results, and she has no known allergies or relevant prior illnesses. In terms of family history related to early development, the mother reported menarche at 10.5 years and hirsutism since childhood. Additionally, there were ovulation issues, and the second child was conceived through artificial insemination. The mother is also a carrier of an unknown type of muscular atrophy. The pubertal development of the father remains unknown. The patient's 12-year-old brother is in good health. Anthropometric measurements and evaluation of adult height were conducted. During the physical examination, the patient exhibited a normal phenotype, without goitre or palpable thyroid. The Tanner stage was G1M1P2. A hormonal study and wrist X-ray for bone age assessment were requested, and the results were within normal limits. Consequently, the patient received a diagnosis of Isolated Premature Pubarche, and a quarterly outpatient follow-up was scheduled.

Key words: Puberty, Precocious, Precocious Puberty, Central, Idiopathic Sexual Precocity, Endocrine System Diseases, Hypothalamic-Pituitary-Gonadal Axis.

1. Introducción

Precocious Pubarche (PP) is an increasingly relevant phenomenon in Spanish pediatric practice. Its incidence appears to be rising in recent years [1]. PP refers to the early appearance of pubic or axillary hair in girls under eight and boys under nine years old [2-3]. This phenomenon occurs without other signs of pubertal development, such as breast growth in girls or testicular enlargement in boys. PP can be associated with various causes, both physiological and pathological, and may significantly impact the health and well-being of affected children. Distinguishing PP from other pubertal disorders, such as central precocious puberty (CPP) or peripheral precocious puberty (PPP), is crucial, as diagnosis and management can vary significantly for these cases.

PP can have multiple etiologies, ranging from normal developmental variants to underlying endocrine disorders requiring appropriate evaluation and treatment. Common causes include early stimulation of the hypothalamic-pituitary-gonadal axis, which can be activated by genetic, environmental, or nutritional factors. [4]. Additionally, obesity has been associated with an increased risk of PP, as adipose tissue can produce small amounts of sex hormones. Other risk factors may include exposure to environmental chemicals acting as endocrine disruptors [5].

2. Case report

We present the case of a 7-year and 9-month-old female patient who visited the Pediatric clinic due to the onset of pubarche at seven years and seven months of age. There is no observed increase in body odour, axillary hair growth, or mastodynia. The mother reports an acceleration in growth velocity over the past few months. The child maintains a proper diet, is physically active, and demonstrates good academic performance. Regarding her personal history, she was born from a controlled gestation and eutocic delivery induced at 39 weeks, with a birth weight of 2,960 kilograms and no neonatal complications. Endocrine-metabolic screening yielded negative results, and she has no known allergies or relevant prior illnesses. In terms of family history related to early development, the mother reported menarche at 10.5 years and hirsutism since childhood.

Additionally, there were ovulation issues, and the second child was conceived through artificial insemination. The mother is also a carrier of an unknown type of muscular atrophy. The pubertal development of the father remains unknown. The patient's 12-year-old brother is in good health.

Physical examination of the patient reveals a normal phenotype. She is in good general condition with normal skin colouration and mucous membranes. No goiter is palpable. The abdomen is normal. The patient had no breast buds or axillary hair. The Tanner stage is G1M1P2. As for somatometry, we recorded the following parameters: height was 118 cm, corresponding to -1.8 standard deviations (SD) according to the 2010 consensus [6] and -1.2 SD according to the WHO [7]. Weight was 21 kg, corresponding to -1.3 SD according to the 2010 consensus [6] and -0.7 SD according to the WHO [7]. The body mass index (BMI) was 15.08 kg/m², translating to -0.8 SD according to the 2010 consensus [6] and -0.2 SD according to the WHO [7]. The body surface area was 0.83 m².

3. Diagnosis

Biochemistry and complete blood count were requested, yielding values within normal limits. Additionally, hormonal analysis revealed the following values: Testosterone: 142.36 pg/mL (150.00 – 700.00), Androstenedione: <24 ng/dL, TSH: 3.32 mIU/L (0.40 - 5.00), LH: <0.1 mIU/mL, Blood cortisol: 16.9 µg/dL (5.33 - 22.4), 17-Hydroxyprogesterone: 1.20 ng/mL, S-DHEA: 128.2 µg/dL (24.0 - 460.0), and Estradiol: <12 pg/mL. The last step involved requesting a wrist X-ray to determine bone age. The result was as anticipated. According to the Protocol for the Management of Precocious Puberty, the patient was diagnosed with Isolated Premature Pubarche [8-9]. A follow-up appointment was scheduled for the next three months, as detailed in Figure 1.

4. Discussion

There is a notable awareness of PP among the pediatric community, and its prevalence has been increasing in recent years in Spain. An identifiable trait of this condition is the premature onset of pubic and axillary hair in girls aged less than eight and boys aged less than nine, with no accompanying signs of puberty [2-11]. PP can be associated with physiological and pathological causes, including endocrine disorders [12]. It is imperative to adopt an individualized approach to managing the issue, factoring in age, pubertal status, and risk factors. In many cases, it may represent a typical developmental variant and not require medical intervention.

Treatment for CPP might include the administration of Gonadotropin-Releasing Hormone (GnRH) analogues to inhibit the activation of the hypothalamic-pituitary-gonadal axis and postpone the advancement of puberty. Treatment with GnRH analogues is effective in managing CPP of central origin, improving final height, and reducing the psychosocial impact of early puberty in affected children. However, their use must be carefully considered and supervised by a pediatric endocrinology specialist, as it can have side effects such as affecting bone mineral density. Inhibitors are likewise recommended.

Regarding PPP, the therapeutic approach may vary. An association has been observed between obesity and an increased risk of PPP, as adipose tissue can produce sex hormones in small amounts. Additionally, exposure to endocrine disruptors in the environment may play a role. Therefore, treatment involves addressing the underlying cause, such as weight reduction in cases of obesity or

eliminating exposure to endocrine disruptors. In some cases, specific treatment for conditions like McCune-Albright syndrome or congenital adrenal hyperplasia may be necessary.

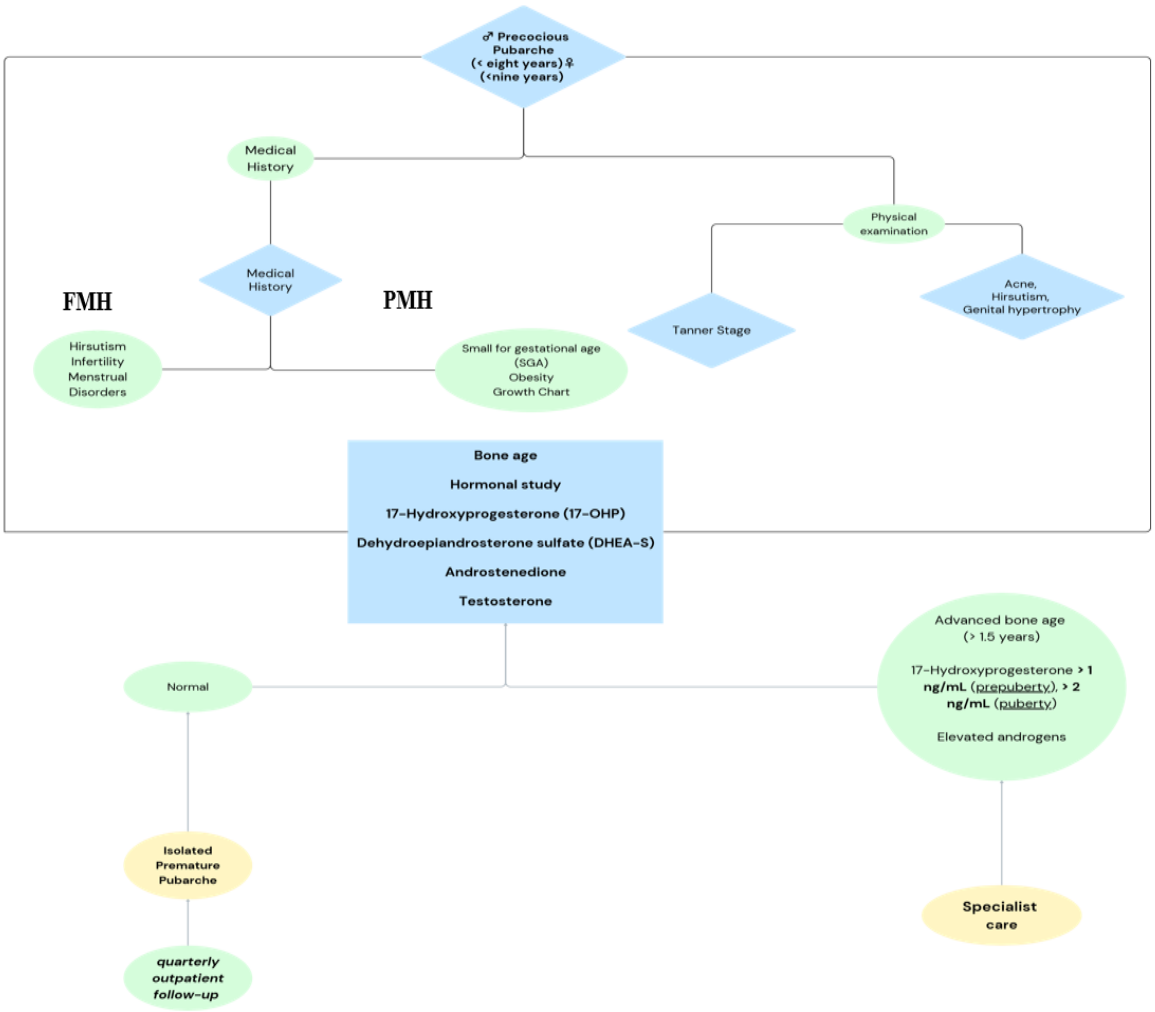

Figure 1 Algorithm approach for Precocious Puberty diagnosis. Source: Author's elaboration. Abbreviations: FMH: Familiar medical history; PMH: Personal medical history; 17OHP: 17-Hydroxyprogesterone; DHEA-S: Dehydroepiandrosterone sulfate; SGA: Small for gestational age.

5. Conclusions

The case presents a 7-year and 9-month-old girl with isolated premature pubarche. Despite the development of pubic hair, she does not exhibit other signs of puberty. A hormonal study and wrist X-ray for bone age assessment were requested, and the results were within normal limits. The patient was diagnosed with isolated premature pubarche and scheduled for quarterly follow-ups. Premature pubarche is an increasingly relevant phenomenon in paediatric practice in Spain, with possible physiological and pathological causes. Management should be individualised, considering the age, degree of pubertal development, and risk factors. There are some cases in which it may be a typical developmental variant and not require medical intervention. In cases of central precocious puberty, treatment may include the use of GnRH analogues, whereas in cases of peripheral precocious puberty, the underlying cause, such as obesity or exposure to endocrine disruptors, should be addressed.

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Abbreviations

The following abbreviations are used in this manuscript:

17-OHP: 17-Hydroxyprogesterone
BMI: Body mass index
CPP: Central precocious puberty
DHEA-S: Dehydroepiandrosterone sulfate
FMH: Familiar medical history
G1M1P2: Tanner Stage; G1 (Genital Stage 1), M1 (Breast Stage 1), P2 (Pubic hair stage 2)
GnRH: Gonadotropin-releasing hormone analogues
LH: Luteinizing hormone
PMH: Personal medical history
PP: Precocious Pubarche
PPP: peripheral precocious puberty
SD: standard deviations
SGA: Small for gestational age
TSH: Thyroid-stimulating hormone
WHO: World Health Organization

Referencias Bibliográficas

1. López-Siguero JP, López Andrés P, Carrascosa Lezcano A, et al. Pubertad Precoz. En: Manual SEEP de Endocrinología Pediátrica. Capítulo 2. Sociedad Española de Endocrinología Pediátrica (SEEP); 2018. p. 29-49.
2. Martínez Aedo, M. J., & Godoy Molina, E. (2019). Pubertad precoz y variantes de la normalidad. Protocolo de Diagnóstico y Tratamiento Pediátrico.
3. Rodríguez, M. L. S., Lozano, G. B., Aizpún, J. I. L., & de Arriba Muñoz, A. (2018, October). Evolución natural de la pubarquia precoz y posibles patologías asociadas. In Anales de Pediatría (Vol. 89, No. 4, pp. 238-245). Elsevier Doyma.
4. Abreu, A. P., & Kaiser, U. B. (2016). Pubertal development and regulation. The Lancet. Diabetes & endocrinology, 4(3), 254–264. https://doi.org/10.1016/S2213-8587(15)00418-0.
5. Parent, A. S., Rasier, G., Gerard, A., Heger, S., Roth, C., Mastronardi, C., Jung, H., Ojeda, S. R., & Bourguignon, J. P. (2005). Early onset of puberty: tracking genetic and environmental factors. Hormone Research, 64 Suppl 2, 41–47. https://doi.org/10.1159/000087753.
6. Ferrández, A., Carrascosa, A., & Sánchez, E. (2010). Estudio longitudinal espanol de crecimiento 1978/2000. Barcelona: Ed. Hercu.
7. World Health Organization. Nutrition for Health. (2009). WHO child growth standards: growth velocity based on weight, length and head circumference: methods and development. World Health Organization.
8. Sant Joan de Déu Barcelona Hospital. Protocolo de estudio y actuación de la pubertad precoz en atención primaria; 2020 [Internet]. Barcelona: Sant Joan de Déu Barcelona Hospital; 2020. Disponible en:https://www.sjdhospitalbarcelona.org/sites/default/files/content/file/2022/04/27/1/202010-vincles-protocolo-pubertad-precoz-hospital-sant-joan-deu-barcelona.pdf.
9. Flores Sáenz, M. (2024). Figure 1: Algorithm approach for Precocious Puberty diagnosis. ResearchGate. https://doi.org/10.13140/RG.2.2.14394.40641.
10. Sultan, C., Gaspari, L., Maimoun, L., Kalfa, N., & Paris, F. (2018). Disorders of puberty. Best practice & research. Clinical obstetrics & gynaecology, 48, 62–89. https://doi.org/10.1016/j.bpobgyn.2017.11.004.
11. de Vries, L., Horev, G., Schwartz, M., & Phillip, M. (2006). Ultrasonographic and clinical parameters for early differentiation between precocious puberty and premature thelarche. European journal of endocrinology, 154(6), 891–898. https://doi.org/10.1530/eje.1.02151.

12. Latronico, A. C., Brito, V. N., & Carel, J. C. (2016). Causes, diagnosis, and treatment of central precocious puberty. The Lancet. Diabetes & endocrinology, 4(3), 265–274. https://doi.org/10.1016/S2213-8587(15)00380-0.