



(CASE REPORT)



## Idiopathic central precocious puberty, a rare entity in boys: A case report

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### Abstract

Precocious puberty is defined as the appearance of clinical signs of puberty before the age of 8 years in girls and 9 years in boys. The central origin is due to a premature activation of the hypothalamic-pituitary-gonadal axis from which a central tumor pathology must be eliminated in each case. It is distinguished from early puberty of peripheral origin which is independent of hypothalamic-pituitary stimulation of adrenal or gonadal origin. In boys, precocious puberty is most often of central origin and there is a high risk of hypothalamic lesion in 40%. The diagnosis is first of all clinical, then radiological by the realization of a bone age and an abdomino-pelvic or testicular ultrasound sometimes even a pituitary MRI, and biological by the GnRH stimulation test, which allows to confirm the premature activation of the hypothalamic-pituitary gonadal axis. Its management is discussed in case of growth acceleration, significant advance of bone maturation, and ultrasound signs of estrogenic impregnation of the internal genitalia or frank activation of the gonadotropic axis.

**Keywords:** Gonadotropic axis; Idiopathic central precocious puberty; GnRH analogues

### 1. Introduction

The natural history of precocious puberty, or that of the cause, is the progressive development of secondary sexual characteristics, the acceleration of the growth rate and the advance of bone maturation which leads to an early fusion of the conjugation cartilages responsible for a definitive statural deficit. There are very slowly progressive forms which do not compromise the final statural prognosis. The recognition of these different clinical forms is not always easy during the initial evaluation but very important, because it will allow modulating the therapeutic indications [1]. Precocious puberty is most often of central origin. In girls, central precocious puberty is idiopathic in more than 80% of cases and in boys it is due to a hypothalamic-pituitary lesion in 70% of cases [2]. Precocious central puberty is manifested by the progressive appearance of secondary sexual characteristics in boys, increase in the size of the testicles and then of the penis, pubic hair. We report the case of a 3 year old boy with central precocious puberty with increased testicular volume and advanced bone age.

### 2. Observation

The child was 3 years and 10 months old, with early development of sexual characteristics, a statural advance > +3DS, the external genitalia were pubescent classified as G5P5 with a 7 cm penis, the testicles had a volume of 25 ml; a moustache with discreet axillary hair; diffuse brown spots on the back reminiscent of café au lait spots. The testicles measured 4.5 cm on scrotal ultrasound; the bone age is estimated at 13-14 years according to the Grew-Liche and Pyle atlas. Hormonal exploration objective a PPC profile with high testosterone at 3.24 ng/mL, FSH: 4.7 mIU/mL, LH: 4.38 mIU/mL; 8:00 cortisol: 9.2 mg/dl, 17OHP (alpha hydroxy-progesterone): 1.7 ng/ml (< 2 ng/ml) normal and SDHEA (dehydroepiandrosterone sulfate): 12.50 mg/dl normal, the rest of the hormonal workup was normal.

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Hypothalamic-pituitary MRI was without abnormality. Treatment with GnRH analogues was started, with quarterly monitoring.

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### 3. Discussion

Early puberty is a warning sign for families because of the increased risk of early sexuality. It is a complex chain of physical and psychological phenomena that lead to the transformation of a girl into a young woman and a boy into a young man [3]. It is important to note that, at present, in addition to these classical definitions, the age limit for defining the early pathological character of pubertal signs is discussed. Indeed, if the age of 8 years seems to be approved in most European countries since the years 1950-1960 [4], this limit is advanced in a physiological way in certain ethnic groups, such as the African or Afro-American populations, where precocious puberty is defined by the appearance of clinical signs before the age of 7 years [5]. Note that the onset of pubertal signs between the ages of 8 and 9 years does not strictly meet the definition of precocious puberty, but does meet that of advanced puberty. [1,6]. In these cases, a rapid evolution can also be responsible for a small size. Thus, if the age of onset of clinical signs is important, the evolutionary character must also be taken into account in the diagnostic and therapeutic approaches [1]. The development of secondary sexual characteristics is accompanied by an acceleration of the statural growth rate and an advance in bone maturation, which is often very important. In some children, the acceleration of the statural growth rate precedes the onset of secondary sexual characteristics. Central or GnRH-dependent early puberty occurs more often in girls than in boys. The heterogeneity of the clinical presentation and definition of precocious puberty is explained by the gradual evolution of the transition period to puberty. LH pulsatility is established long before puberty and the increase in peak amplitude is the essential biological sign of pubertal maturation of the gonadotropic pituitary gland [7]. Management is aimed at improving the prognosis of final height, delaying menarche, and preventing psychological disorders related to this disease. Treatment with GnRH analogues is most commonly used for central precocious puberty (CPP), etiological treatment is devoted to patients with peripheral precocious puberty (PPP).

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### 4. Conclusion

In our study, precocious puberty can be of central idiopathic origin in a boy. According to the data of the literature and the results of our study, in front of any central precocious puberty occurring in a boy, it will be necessary to systematically ask for a cerebral imaging in order not to miss a hypothalamo-hypophyseal lesion.

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### Compliance with ethical standards

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#### *Disclosure of conflict of interest*

The authors declare no conflict of interests.

#### *Statement of ethical approval*

The present research work does not contain any studies performed on animals/humans subjects by any of the authors.

#### *Statement of informed consent*

Informed consent was obtained from all individual participants included in the study.

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