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PRECOCIOUS PUBERTY AND PREMATURE THELARCHE IN GIRLS:

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Abstract:

Introduction*: Early puberty is a pathology known by the appearance of clinical signs of puberty before the age of 8 years for girls and 9 years for boys. In 90% of the cases, it's a Central Precocious Puberty. It could be peripheral too. The precocious puberty etiologies are variable but it's idiopathic in 90% of cases*

Materials and Methods*: retrospective descriptive study of three cases of precocious puberty admitted in pediatric endocrinology department (Pediatric II) in the Children's Hospital of Rabat during 2018. The main elements studied were: the age, the sex, clinical symptoms of PP, hormonal tests, mammary and pelvic ultrasound, and magnetic resonance imaging of the hypothalamic pituitary axis, diagnosis elements, treatment and evolution.*

Results*: 3 girls aged respectively three, four and nine years old admitted for precocious puberty. The clinical examination finds a breast development and a pubic hair in a patient. Tanner stage at S3P1 in 2 patients and S3P2 in 1 patient. Pelvic ultrasound showed a pubertal uterus in two patients and prepubertal in one patient. The Decapeptyl test was performed in all 3 patients. The diagnosis of thelarche prematurity was made in one patient and the diagnosis of idiopathic central precocious puberty was made in the two other patients treated with Decapeptyl.*

Conclusion*: Early puberty is defined by the age of early onset of sexual characteristics that brings the paradox to a large size during childhood and a small adult size*

Keywords: *Precocious puberty, premature thelarche, breast development, pubic ultrasound, hormonal tests.*

1 INTRODUCTION:-

Puberty is the period of human development during which physical growth and sexual maturation occurs. It is a period of physical, hormonal, and psychological transition from childhood to adulthood, with accelerated linear growth and achievement of reproductive functions. Precocious puberty is a pathology known by the appearance of clinical signs of puberty before the age of 8 years for girls and 9 years for boys. Untreated, precocious puberty can lead to obesity and metabolic disorders: hyperlipidemia, diabetes, and hypertension.Premature thelarche is a breast development in the absence of any other clinical signs of pubertal maturation in girls; it can evaluate normally but can also initiate a precocious puberty. The clinical symptoms, pelvic imaging and hormonal tests that makes the difference between both of them

2 Materials and Methods

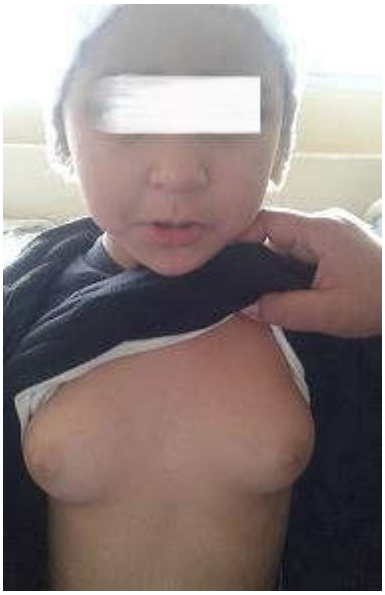
A retrospective descriptive study of 3 patients with precocious puberty admitted in the endocrinology pediatric department (Pediatric II department) in the Children Hospital of Rabat throughout 2018.. The main elements studied were: the age, the sex, weight, length, Clinical symptoms of early puberty, Tanner scale, bone age, hormonal tests, breast and pelvic ultrasound exam, Magnetic resonance imaging of the hypothalamic pituitary axis, Decapeptyl test and medical treatment.

3 Results:

From January 1st to June 30th, 2018, 3 female patients were admitted in endocrinology paediatric department (Paediatric II department) for precocious puberty

Case n° 1:

A 3,5 years old girl, (the date of birth: March 4th, 2014). No parental consanguinity; have presented a breast development since six months (photo n°1). Physical examination: chronological age: 3years old and 8 months, weight: 20Kg (+2SD), length= 100 cm (+ 1SD), no coetaneous spot. Tanner scale: S3P1, Female external genital organs. Paraclinical examinations: bone age: = 4 years old for a chronological age of de 3years old and 8 months. Hormonal tests: œstradiol=20,45pg/ml, FSH= 2,08mUI/l and LH =2,0 mUI /l . The breast and pelvic ultrasound showed a bilateral mammary hypertrophy without tumour and a pubertal uterus: 42 mm of length and uterine corpus/cervix > 1 and normal ovaries. The magnetic resonance imaging of the hypothalamic pituitary axis was normal. The LHRH test and Triptorelin depot stimulation test for central precocious puberty test were done: LH surge; LH/FSH = 2,4 (Table 1) The patient was diagnosed as an idiopathic central precocious puberty. The treatment was Decapeptyl 3,75 mg on intramuscular injection every 28 days Clinical and biological surveillance every 3 months



Patient 1
A 3years old and 8 months with developed breast

	Test au LHRH		Test au décapeptyl	
	FSH	LH	FSH	LH
T0	5,71	2,64	5,12	2,94
T15	14,51	40,14	13,02	32,28
T30	17,37	40,12	21,59	51,10
T45	18,16	34,74	28,27	49,44
T60	18,37	31,21	26,36	48,78

Patient 1
Table 1: LHRH and Decapeptyl tests of the 1st patient

Case n2:

An 8, 5 years old girl, (the date of birth: July 7th, 2009). No parental consanguinity; have presented a breast development since the age of six years old and appearance of pubic and axillary hair. Physical examination: chronological age: 8years old and 6 months, weight: 30Kg (+1SD), length= 132 cm (M), no cutaneous spot , Dysmorphic feature neither. Tanner scale: S3P2: pubic and axillary hair, Female external genital organs. Paraclinical examinations: bone age: = 9 years old and 6 months for a chronological age of de 8years old and 6 months. Hormonal tests: œstradiol=12pg/ml, FSH= 1,99mUI/l, LH=0, 14 mUI /l. The pelvic ultrasound showed: a pubertal uterus: 42 mm of length and uterine corpus/cervix =1 and

normal ovaries. The magnetic resonance imaging of the hypothalamic pituitary axis was normal. The LHRH test and Triptorelin depot stimulation test for central precocious puberty test were done: LH surge; LH/FSH = 1, 6 (Table 2)
The patient was diagnosed as an idiopathic central precocious puberty. The treatment was Decapeptyl 3, 75 mg on intramuscular injection every 28 days. Clinical and biological surveillance every 3 months

	Test au LHRH		Test au décapeptyl	
	FSH	LH	FSH	LH
T0	1,57	0,10	1,87	0,03
T15	5,49	8,78	6,14	10,61
T30	10,19	17,25	8,23	11,85
T45	11,18	14,78	9,09	11,89
T60	10,82	12,16	10,70	12,94

Patient n 2
Table in 2: LHRH/Decapeptyl tests of the 2nd patient

Case in 3:
A 1 year's old and 8 month's girl, (the date of birth: February 2nd, 2016). No parental consanguinity; have presented a breast development since the age of six months. Physical examination: chronological age: 1 year old and 8 months, weight: 13,3Kg (+2SD), length=86 cm (+1,5 SD). no cutaneous spot , Dysmorphic feature neither. Tanner scale: S3P1. Paraclinical examinations: bone age: = 3 years old for a chronological age of 1 year and 8 months Hormonal tests: œstradiol less than 9 pg/ml, Follicle-stimulating hormone FSH= 6,63mUI/l and Luteinizing hormone LH=0,44 mUI /l. Pelvic ultrasound found a prepubertal uterus, thin and normal ovaries. LHRH test : no LH surge, LH/FSH = 0,45 (Table:3)
Diagnosis: Premature Thelarche Clinical surveillance

	Test au LHRH	
	FSH	LH
T0	4,7	1,3
T15	19	9
T30	26,5	12
T45	36	13,5
T60	38	15

Patient 3
Table in 3: LHRH test

Pubic Hair Scale (both males and females)
Stage 1: No hair
Stage 2: Downy hair
Stage 3: Scant terminal hair
Stage 4: Terminal hair that fills the entire triangle overlying the pubic region
Stage 5: Terminal hair that extends beyond the inguinal crease onto the thigh
Female Breast Development Scale
Stage 1: No glandular breast tissue palpable
Stage 2: Breast bud palpable under areola (1st pubertal sign in females)
Stage 3: Breast tissue palpable outside areola; no areolar development
Stage 4: Areola elevated above contour of the breast, forming "double scoop" appearance
Stage 5: Areolar mound recedes back into single breast contour with areolar hyperpigmentation, Papillae development and nipple protrusion

Figure in 1: TANNER stages in female []

4 Discussion

Puberty is a period of physical, hormonal, and psychological transition from childhood to adulthood, with accelerated linear growth and achievement of reproductive function [1].Early puberty is a pathology known by the appearance of clinical signs of puberty before the age of 8 years for girls and 9 years for boys. In 90% of the cases, it's a Central Precocious Puberty [2] gonadotropin-dependent due to the reactivation of the hypothalamic-pituitary axis. The less common is the peripheral precocious puberty or gonadotropin-independent precocious puberty that occurs without the involvement of Gn-RH hormone. In our study, both cases were caused by a central precocious puberty. The diagnosis of precocious puberty is based mainly on clinical, biochemical and imaging parameters. Clinically, precocious puberty in girls starts with breast development and appearance of axillary and pubic hair according to Tanner Scale [3]. And sometimes rapid growth rate in relation to age [4]. In our study 2 girls developed precocious puberty with respectively Tanner scale S3P1 and S3P2. In first case, bone age was 3 years old for a chronological age of 1 year and 8 months. In the second case, bone age was 9 years old and 6 months for a chronological age of de 8years old and 6 months. The hormonal tests, in precocious puberty, shows a high value of FSH, LH and an LH surge in LHRH test. And the pelvic ultrasound shows pubertal uterus which agrees with the literature. A study, in 2008, confirmed the same clinical and paraclinical signs of precocious puberty [5] concerning the etiologies of precocious puberty, the cause could be genetic: chromosomal abnormalities, Central Nervous System abnormalities like hypothalamic hamartoma, tumors like astrocytoma [6] Precocious puberty is idiopathic in more than 90% [7]. In our study, both cases are Idiopathic Central Precocious puberty. The central precocious puberty have to be treated with Triptorelin: intramuscular injection every 28 days. The premature thelarche was defined by Wilkins in 1957 as an isolated breast development in the absence of any
other clinical signs of pubertal maturation in girls younger than age 8 years, predominantly in the first 2 years of life[8]. Isolated premature thelarche is seen in 4.7% of female children and in up to 14% of all patients referred to endocrinology clinic for evaluation of precocious puberty [9]The premature thelarche can be considered a variant of normal puberty or can be also the beginning of precocious puberty [10]. progression to precocious puberty is seen in up to 13% of cases [11] In Bologhine Ibn Ziri Hospital in Algeria, a study showed premature thelarche is normal when Tanner scale is less than SII and when chronological and bone age are equal; The evolution to probable precocious puberty is eliminated with normal Hormonal tests and normal pelvic child ultrasound and chronological and bone age are equal. In their study, 19 of the 28 having had premature thelarche have had normal puberty (67,6%). So according to this study, the majority of premature thelarche evolve to normal puberty [12]. De Vries and al.16 reported that 51% of the 139 girls diagnosed with premature thelarche had regression of the breast tissue, whereas some (36%) had persistent breast tissue [12]. A study made in India objected that premature thelarche is a normal growth variant it shows spontaneous remission in majority of cases [14]. However, progression to precocious puberty is seen in up to 13% of cases [11]. In our study, the third case – the premature thelarche- presents a strong possibility of regression of thelarche.

5 CONCLUSION

Precocious puberty has physical, psychological, and social implications that are complex and influenced by many factors. The clinical diagnosis of precocious puberty is not always easy, particularly in females and among variants of normal development premature thelarche. The clinician must consider a broad differential of central and peripheral causes.

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