

Untreated Congenital Adrenal Hyperplasia with Central Precocious Puberty

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Background: Congenital adrenal hyperplasia (CAH) may cause early maturation of hypothalamic – pituitary – gonadal axis causing precocious puberty. The exact mechanism is not clear, but it may be associated with changes in physical growth, body composition, skeletal maturation and sex steroid production, somehow triggering the onset of central puberty. This often happens when the initiation of corticosteroid treatment is late or/and there is poor compliance. The latter sometimes leads to a lack of treatment. In most cases, if the child survives, he or she develops central precocious puberty after 5-6 years in life (usually bone age is 10-11).

Objective: We present a boy later diagnosed with salt-wasting type of CAH. In this case the diagnosis was established after the development of precocious puberty.

A 12 years old boy born of a normal pregnancy and delivery with a birth weight 3250 g. He is the first child of non-consanguineous parents of Turkish descent. There is no family history of chronic diseases. The perinatal period was smooth. In the first months of life he was admitted to children's wards with poor weight gain, persistent vomiting and electrolyte abnormalities. The baby was thought to have dehydration and treated with electrolyte solutions. No additional medical examinations were performed. After the age of 2 these episodes became rare.

At the age of 6 the boy had testicular and penile enlargement and premature pubarche, but no medical advice was requested.

In 2010, when the child was 9 years old, the family was born another male. At that time our country had already established a national screening program for congenital adrenal hyperplasia. The newborn had high levels of 17 – OHP, was diagnosed with CAH and started receiving replacement therapy with corticosteroids and mineralcorticoids.

This led to the diagnosis of the toddler with CAH and precocious puberty. Subsequently CAH salt-wasting type diagnosis was genetically confirmed in both children.

At that time the 9 year old boy had advanced pubertal development with testicular volume 25 ml; penis of 11/3 cm and pubic hair Tanner stage grade V.

Outpatient studies were conducted: 17 – OHP 1792 nmol/L (normal range < 30 nmol/L); sex hormones were typical for puberty - luteinizing hormone (LH) concentration of 1.89 mIU/mL (normal range: 1.54-7.0 mIU/mL), a follicle-stimulating hormone (FSH) level of 2.6 mIU/mL (normal range: 1.5-7.0 mIU/mL) and a testosterone level of 4.01 ng/mL (normal range: 3.5-9.7 ng/mL). Specialists recommended hospitalization, more profound examinations and replacement therapy with corticosteroids and mineralcorticoids, as well as administration of LHRH - analogue. However, the parents refused the prescribed therapy and the child was not followed up.

Methods: The child was admitted to our clinic where physical and laboratory investigations were conducted:

Height: 156 cm (SDS_H 0.73), Weight 54 kg (SDS_w 1.05), BMI 22,2 (80 p).

Physical examination showed pubertal development Tanner stage V – testicular volume 25 ml; penis of 12/4 cm, pubarche V stage, without pathologic signs from other systems.

Blood pressure measurement every 3 hours: values between 109/68 mmHg and 130/85 mmHg

Blood sample analysis: Normal FBC, biochemical results: Na 148 mmol/L; K 4.6 mmol/L; Cl 102 mmol/L;

Hormonal analysis: 17-OH P 2551 nmol/L (normal range < 30 nmol/L); LH 3.11 mIU/mL; FSH 3.62 mIU/mL; Testosterone 5.2 ng/mL

Hand X- ray – bone age is 17 years, growth plates are closed;

Ultrasonography of the kidneys and adrenal glands: No pathological abnormalities of the kidneys. Right adrenal sizes 5.0/2.2 cm, with hyperechogenic cortex; left adrenal sizes 4.9/1.9 cm, with hyperechogenic cortex and hypoechogenic medulla.

Psychological counseling: Intellectual development is normal, IQ=84 (the lower limit of normal). The boy is shy and unsure of himself. Follow-up required.

Results: Due to the advanced pubertal signs and highly advanced bone age, it is expected that the final height to remain low.

There are already some psycho-social problems because of the early pubertal development, others are expected in connection with short stature.

During the hospital stay he started therapy with corticosteroids and mineralcorticoids.

At this point it is imperative for the patient to take the prescribed therapy.

Levels of 17-OH progesterone should be monitored regularly in order to adapt the treatment.

The boy should be followed up by pediatric endocrinologist and urologist because of the risk of developing TART.

Conclusion: Timely diagnosis of congenital adrenal hyperplasia, as well as good compliance are crucial for normal physical development and prevention of central precocious puberty, short stature, psychological disturbances and bad quality of life.

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A picture of our patient at the age of 12 with his little brother



Hand X-ray