

THE MODERN APPROACH TO DIFFERENTIAL DIAGNOSIS OF CONSTITUTIONAL DELAY OF PUBERTY AND HYPOGONADOTROPIC HYPOGONADISM

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OBJECTIVE

We assessed the accuracy of the GnRH agonist test (Triptorelin 0,1 mg) and the human chorionic gonadotropin (hCG) test in comparison with basal sex hormones for the differential diagnosis of constitutional delay of puberty (CDP) and hypogonadotropic hypogonadism (HH) in boys.

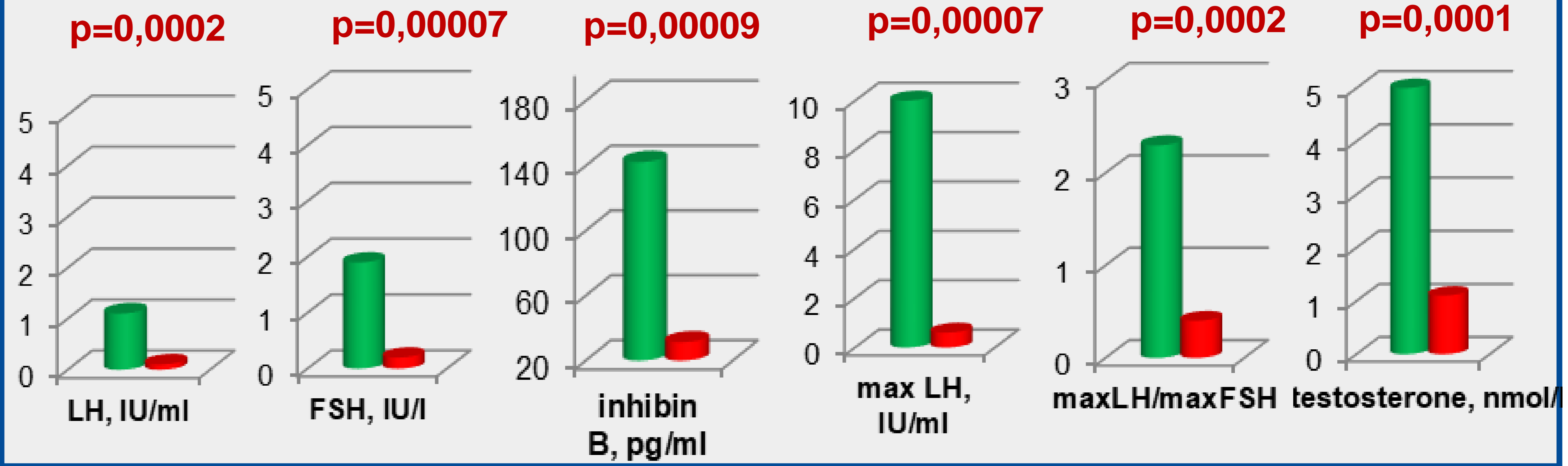
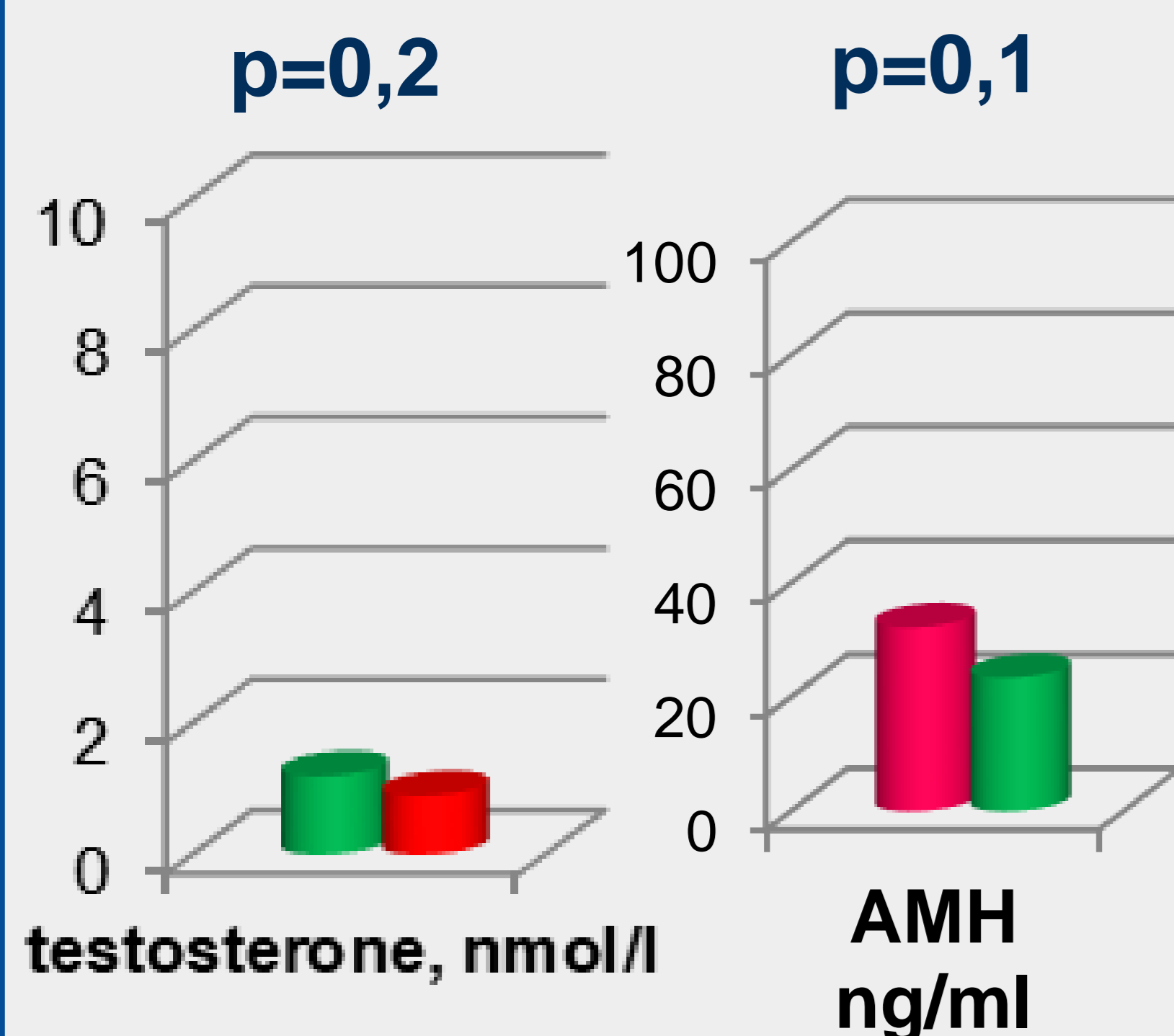
METHODS

The study included 56 boys with delayed puberty (Tanner1).
At the first visit in $14,5 \pm 0,9$ years, we evaluated LH, FSH, testosterone, anti-Mullerian hormone (AMH), inhibin B and the results of the stimulation tests.
At the second visit after 2 years, we evaluated testicular volume in boys. The patients were divided into two groups: *the first group with CDP* and testicle ≥ 3 cm³ (n=50,89 %) and *the second group with HH* and testicle < 3 cm³ (n=6, 11%).
 We compared parameters of the two groups at the first visit.
 At the first visit all patients had the same age ($14,4 \pm 0,8$ vs $15,3 \pm 1,9$ years old, $p=0,3$).

RESULTS

At the first visit all patients had the same testosterone (Me 1,2 vs 0,9 nmol/l, $p=0,2$), AMH (Me 32,3 vs 23,4 ng/ml, $p=0,1$).

At the first visit in boys with CDP, hormones were significantly higher, such as, LH (Me 1,1 vs 0,1 IU/ml, $p=0,0002$) FSH (Me 1,9 vs 0,2 IU/l, $p=0,00007$), inhibin B (Me 142,3 vs 31,3 pg/ml, $p=0,00009$), max LH (Me 18,9 vs 0,6 IU/ml, $p=0,00007$), maxLH/maxFSH (Me 2,3 vs 0,4, $p=0,0002$) on the GnRH agonist test and Δ testosterone (Me 14,4 vs 1,1 nmol/l, $p=0,0001$) on the hCG test than in boys with hypogonadotropic hypogonadism.



We have defined the criteria for differential diagnosis of CDP and HH in boys.

The criteria for differential diagnosis of CDP and HH	sensitivity, %	specificity, %	AUC (95 % DI)
LH $\geq 0,3$ IU/ml	86	100	$0,935 \pm 0,034$ (0,869 - 1)
FSH $\geq 0,5$ IU/l	100	100	1 ± 0 (1-1)
inhibin B ≥ 58 pg/ml	100	100	1 ± 0 (1-1)
max LH $\geq 3,5$ IU/ml	100	100	1 ± 0 (1-1)
maxLH/maxFSH ≥ 1	92	100	$0,960 \pm 0,025$ (0,91-1)
Δ testosterone $\geq 2,7$ nmol/l	98	100	$0,996 \pm 0,006$ (0,985-1)

CONCLUSIONS

The max LH $\geq 3,5$ IU/ml, maxLH/maxFSH ≥ 1 on the GnRH agonist test and Δ testosterone $\geq 2,7$ nmol/l on the hCG test have an excellent accuracy for the differential diagnosis of CDP and HH in prepubertal boys with delayed puberty. However, LH $\geq 0,3$ IU/ml, FSH $\geq 0,5$ IU/l, inhibin B ≥ 58 pg/ml in combination are a reliable and less-invasive alternative test.

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