

# Constitutional delay of puberty or hypogonadotropic hypogonadism: Diagnostic value of inhibin B and AMH measurements.

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## Background and aims:

Boys with delayed puberty represent one of the main cause for pediatric endocrine referrals. The aim of the study was to evaluate the usefulness of inhibin B and AMH as biological markers for distinguishing between constitutional delay of growth and puberty (CDGP) and isolated hypogonadotropic hypogonadism (IHH).

## Methods :

Observational, retrospective and monocentric study. Inclusion criteria : age older than 14 years at first clinical exam and biological assessments, and Tanner stage I or II.

## Results

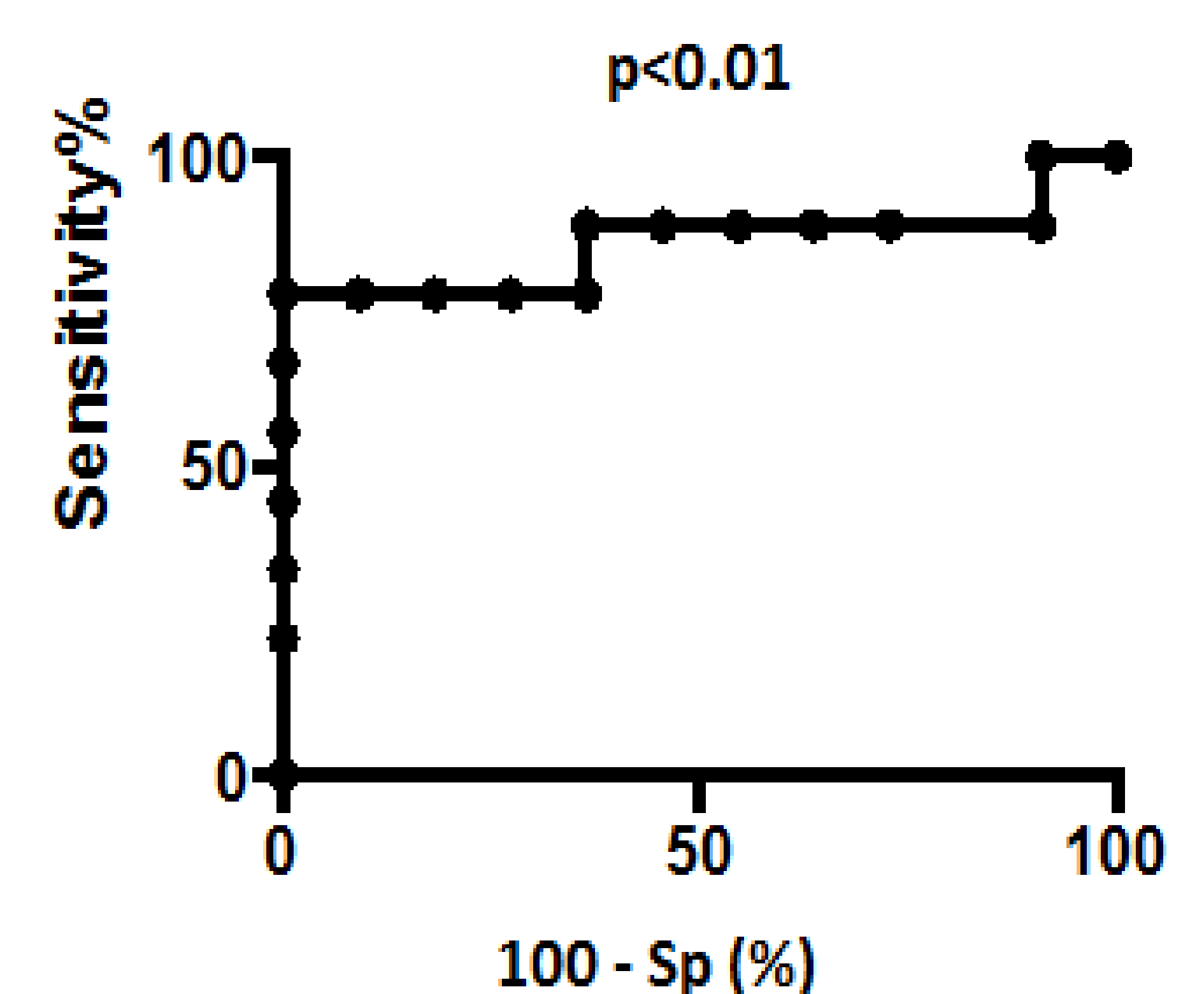
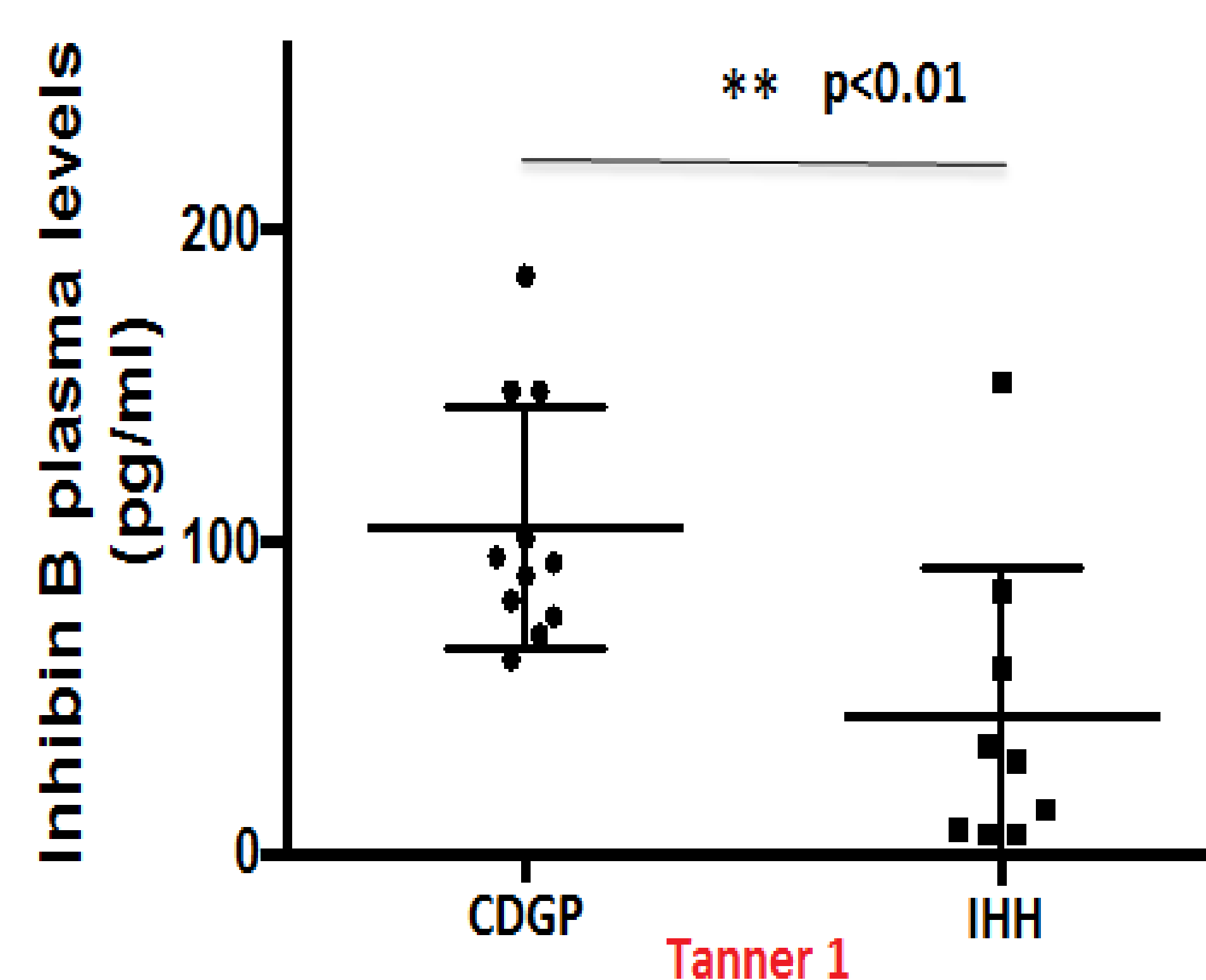
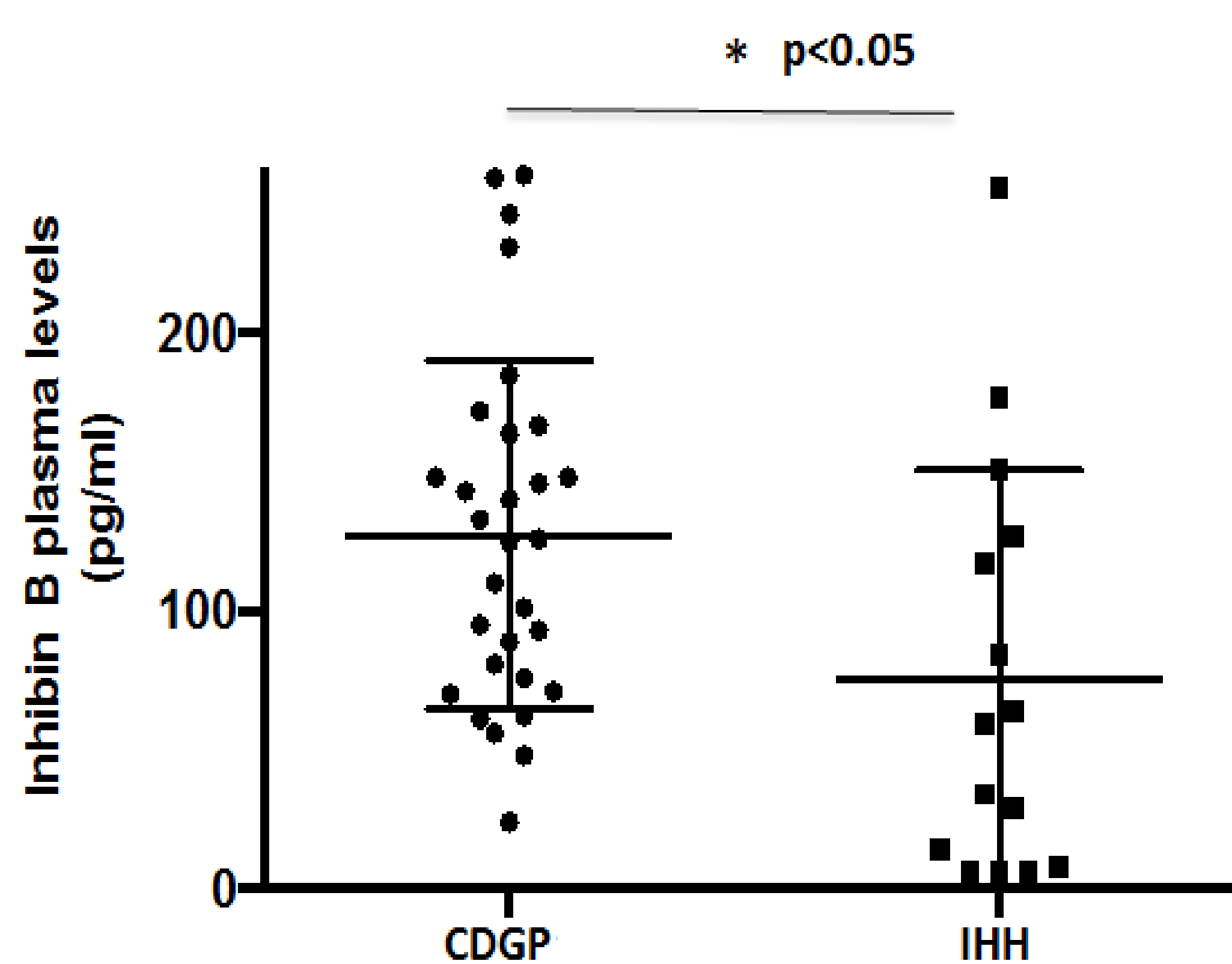
### Patient characteristics

	CDGP N=30	IHH N=15	p
Family history of CDGP (N, %)	12 (40)	6 (40)	NS
Family history of cryptorchidism (N, %)	1 (3)	0 (0)	NS
Family history of anosmia (N, %)	0 (0)	0 (0)	NS
Mean age	15,1 ± 0,8	15,4 ± 0,9	NS
Delay of growth (N, %)	28 (93)	8 (27)	0,0034
Height (SD)	-1,6 ± 1,1	-1,6 ± 1,7	NS
Height (SD / target height SD)	1,64 ± 1	2,1 ± 1,6	NS
Bone age	12,7 ± 1,1	13,5 ± 0,8	0,071
BMI	20 ± 4	22,3 ± 6,9	NS
Anosmia (N, %)	1 (3)	4 (27)	0,036
Personal history of cryptorchidism	1 (3)	5 (33)	0,012
Cryptorchidism at the clinical examination	1 (3)	6 (40)	0,0036

### Comparison of hormonal profiles

Hormone levels Mean ± SD	CDGP N=30	IHH N=15	p
Inhibin B (pg/ml)	127 ± 63	76 ± 75	<b>0.016</b>
AMH (pmol/L)	279 ± 207	332 ± 239	0,55
Testosterone (ng/ml)	0,54 ± 0,49	0,46 ± 0,36	0,98
FSH (UI/l)	2,7 ± 2,5	1,7 ± 1,5	0,072
LH (UI/l)	1,20 ± 1	0,64 ± 0,70	<b>0,028</b>
FSH peak (UI/l)	5,3 ± 4,6	5,2 ± 3,5	0,79
LH peak (UI/l)	13,89 ± 6,85	8,21 ± 8,8	<b>0,026</b>
LH peak > FSH peak (N, %)	22 (73)	6 (40)	0,05

There were no significant differences for AMH, testosterone or FSH levels.



Compared with CDGP patients those with IHH had significant lower inhibin B levels (p=0.016), especially at Tanner stage I (40 ± 45 pg/ml vs. 100 ± 39 pg/ml, p=0.005).

Inhibin < 60 pg/ml  
 Se=78%  
 Sp=100%

**The Inhibin B marker was confirmed to be the best diagnostic tool to discriminate IHH from CDGP. We propose a new cut-off value of 60 pg/ml when using new specific inhibin B reagents (from Anshlabs), and a cut-off value of 41 pg/ml in patients with Tanner stage I. A different method of bioassay was used in previous studies (Oxford Bioinnovation reagents) \***

\* Coutant et al., JCEM, 2010