COULD BASAL AMH REPLACE HCG STIMULATION TEST IN PATIENTS WITH XY DISORDER OF SEX DEVELOPMENT?

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INTRODUCTION

- Traditionally, the standard endocrinological evaluation of 46, XY disorder of sex development (DSD) cases is based upon measurement of testosterone, dihydrotestosterone and androstenedione and their ratios either in mini-puberty or after Human Chorionic Gonadotropin (hCG) stimulation. More recently, there has been a growing appreciation for assessing Sertoli cell function because the most active compartment of the testis before puberty is the seminiferous tubule compartment, in which Sertoli cells proliferate and secrete hormones like anti-mullerian hormone (AMH) and inhibin B.
- Therefore, basal AMH and inhibin B measurement may be considered a diagnostic tool that gives reliable information about both the presence and function of the testes.

OBJECTIVES

- There are controversies about the value of AMH and inhibin B in the evaluation of cases with XY DSD. Therefore, this study was conducted to highlight the importance of AMH measurement and to determine whether basal AMH is able to predict prepubertal testicular function without stimulation tests or not.

SUBJECTS AND METHODS

- This study was conducted on 33 patients with XY DSD referred to our Endocrinology Clinic in Alexandria University Children's Hospital through a year. Their age ranged from neonatal period to 13.25 years. All patients were subjected to history taking, general and genital examination, karyotyping, hormonal assessment, and abdominopelvic ultrasound. Some patients needed laparoscopy and gonadal biopsies. Hormonal assessment included basal FSH, LH, AMH, inhibin B, and testosterone measurements and hCG stimulation test by giving hCG (1500 IU/day) intra-muscular injections for three consecutive days. Spearman rank correlation coefficients were calculated between D testosterone and basal inhibin B, AMH, FSH, and LH.

RESULTS

- Using Spearman coefficient, there was statistically significant correlation between basal AMH and testosterone increment after hCG stimulation (delta change of serum testosterone). Inhibin B, FSH and LH had no statistically significant correlation with testosterone increment after hCG stimulation.

	Delta change of testosterone	
	r_s	P
Inhibin B	0.193	0.345
AMH	0.640*	<0.001*
FSH	-0.267	0.188
LH	0.290	0.151

rs: Spearman coefficient

Table(1): Correlation between delta change of testosterone during hCG stimulation test and serum level of inhibin B, AMH, FSH, and LH

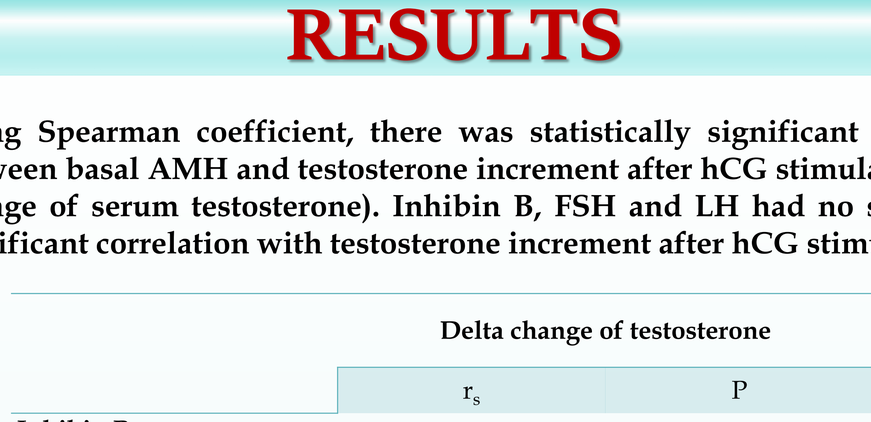


Figure (1): Correlation between delta change of testosterone during hCG stimulation test and serum level of AMH

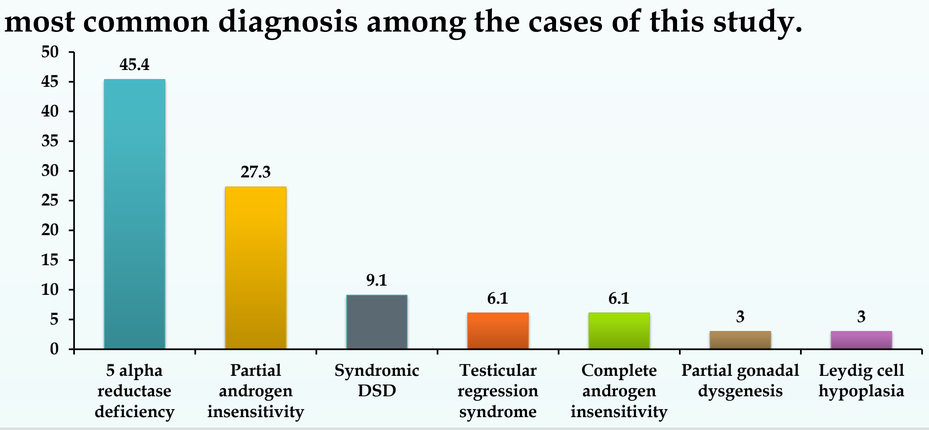
- There was statistically significant positive correlation between basal AMH and inhibin B. Thus, when serum AMH had low value, the serum inhibin B was low and vice versa in most of the cases.

AMH	Inhibin B: Low (n= 8)		Normal (n= 11)		High (n= 14)		Test of sig.	P
	No.	%	No.	%	No.	%		
Low	5	62.5	2	18.2	1	7.1	χ^2= 10.980*	MCp= 0.025*
Normal	3	37.5	9	81.8	11	78.6		
High	0	0.0	0	0.0	2	14.3		
Min. – Max.	0.01 – 153.9		17.93 - 181.90		30.70 - 333.0		H= 5.386	0.068
Mean ± SD.	59.33 ± 53.61		86.65 ± 52.18		135.04 ± 88.96			
Median	47.80		74.80		112.0			
Sig. between stages	p_1=0.283, p_2=0.029* p_3=0.163							
r_s(p)	0.483*(0.004*)							

χ2, p: χ2 and p values for Chi square test
MC: Monte Carlo for Chi square test
H,p: H and p values for Kruskal Wallis test, Sig. bet. groups was done using Mann Whitney test
p1: p value for comparing between low and normal
p2: p value for comparing between low and high
p3: p value for comparing between normal and high
rs: Spearman coefficient
*: Statistically significant at p ≤ 0.05

Table (2): Correlation between serum levels of Inhibin B and AMH

- After complete assessment of the studied cases, they were classified according to their diagnoses. Five alpha reductase deficiency was the most common diagnosis among the cases of this study.



Figure(2): Distribution of the studied cases according to the final diagnosis

CONCLUSIONS AND RECOMMENDATIONS

- HCG stimulation test is the gold standard in the assessment of XY DSD cases as it give an idea about Leydig cell function. However, Sertoli cell function estimation is needed to fulfill the assessment of these cases.
- A single measurement of basal AMH or inhibin B is highly informative about the presence and function of testes. Although, that cannot obviate the need for hCG test in the work-up.
- Collaborative hormonal assay should be done to reach the final diagnosis in most of the DSD cases.

REFERENCES

- Hafez M, El Dayem SM, El Mougy F, Atef A, Kandil M, Galal A, et al. The role of anti-Mullerian and inhibin B hormones in the evaluation of 46, XY disorders of sex development. J Pediatr Endocrinol Metab. 2014; 27(9-10):891-9.
- Edelsztein NY, Grinspon RP, Schteingart HF, Rey RA. Anti-Müllerian hormone as a marker of steroid and gonadotropin action in the testis of children and adolescents with disorders of the gonadal axis. Int J Pediatr Endocrinol. 2016;20:1-10.
- Ahmed SF, Keir L, McNeilly J, Galloway P, O'Toole S, Wallace AM. The concordance between serum anti-Mullerian hormone and testosterone concentrations depends on duration of hCG stimulation in boys undergoing investigation of gonadal function. Clin Endocrinol (Oxf) 2010; 72(6):814-9.
- Kubini K, Zachmann M, Albers N, Hiort O, Bettendorf M, Wölfle J, et al. Basal inhibin B and the testosterone response to human chorionic gonadotropin correlate in prepubertal boys. J Clin Endocrinol Metab 2000;85(1):134-8.

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