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Insulin Sensitivity in Adolescents with Gender Dysphoria during Puberty Suppressing Therapy with GnRH Agonists

Introduction

According to the endocrine society guidelines [1] GnRH analogues (GnRHa) are used to suppress pubertal development of the natal sex in gender dysphoric adolescents.
The metabolic implications of pubertal suppression have not yet been explored. During puberty a decrease in insulin sensitivity is normally observed, perhaps mediated by changes in growth hormone production and in body composition.

Objective

The effects of GnRH agonists on insulin sensitivity during 2 years of treatment in adolescents with Gender Dysphoria were examined.

Conclusions

No significant change in insulin sensitivity occurred during two years of treatment with GnRH analogue therapy in gender dysphoric adolescents.
It is reassuring that our puberty delaying protocol in gender dysphoric adolescents, using GnRHa, does not impair insulin sensitivity.

Experimental Setup

During GnRHa treatment fasting blood samples were drawn every six months to determine fasting glucose, serum insulin and IGF1 levels. QUICKI was calculated to determine insulin sensitivity. Fat percentage was measured yearly using DXA (Hologic QDR 2000).

Subjects

Ninety-one adolescents with GD, 41 male-to-females (MtF) and 50 female-to-males (FtM) receiving 3.75 mg of the GnRH agonist triptorelin s.c./i.m. every 4 weeks, were included in this study.

Statistics

Mixed Model linear analyses were performed.

Results

No significant changes in QUICKI were observed in either sex during two years of GnRHa treatment (figure 1).

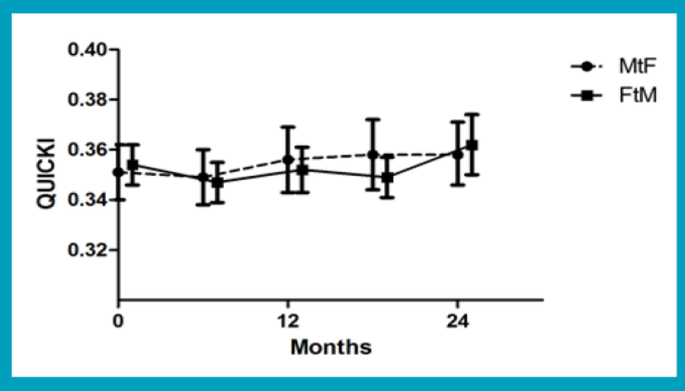

Figure 1. QUICKI during 24 months of GnRHa treatment.
Data are expressed as Estimated Marginal means and 95% confidence intervals.
MtF: male to female; FtM: female to male.

Both groups showed a significant decrease in IGF1 and increase in fat percentage (figure 2).
A significant correlation between QUICKI and IGF1 was found in FtM and a significant correlation between QUICKI and fat percentage in both groups (table 1).

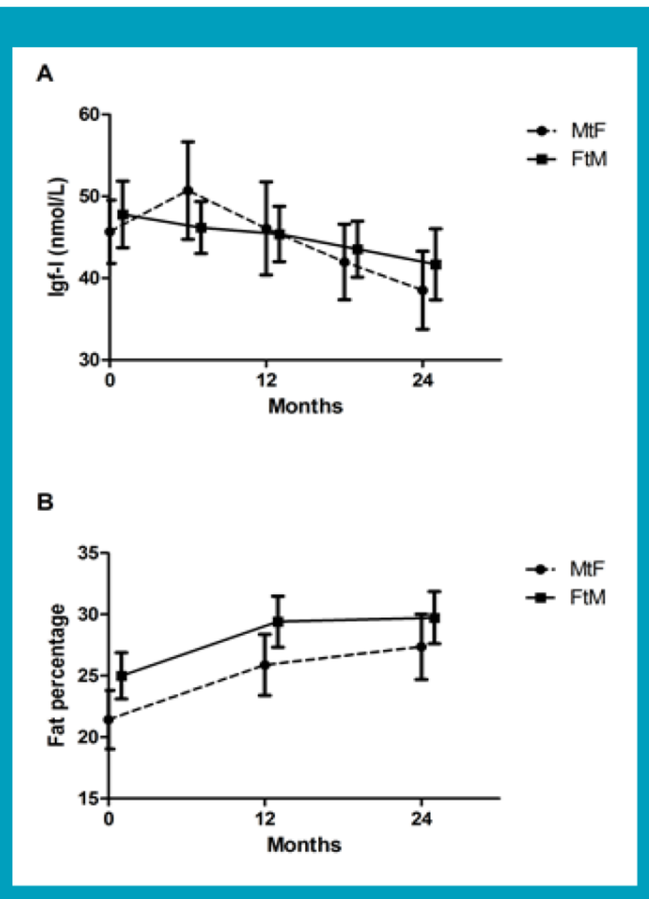

Figure 2. : IGF1 and fat percentage during 24 months of GnRHa treatment. Data are expressed as Estimated Marginal means and 95% confidence intervals.
MtF: male to female; FtM: female to male.

	MtF				FtM			
	At start	24 months	β-coefficient with QUICKI	p value of β	At start	24 months	β-coefficient with QUICKI	p value of β
IGF-1 (nmol/L)	45.7±1.9	38.5±2.3	$-1.2x10^{-4}$	0.692	47.8±2.0	41.7±2.1	$-7.5x10^{-4}$	0.001
Fat percentage	21.4±1.1	27.4±1.3	$-1.4x10^{-3}$	0.014	25.0±0.94	29.7±1.0	$-1.2x10^{-3}$	0.01

Table 1. Changes in IGF-1 and fat percentage and their relationship with QUICKI during two years of GnRHa treatment. Values are estimated marginal means ± standard error

References

1) Hembree, W.C., et al., *Endocrine treatment of transsexual persons: an Endocrine Society clinical practice guideline.* J Clin Endocrinol Metab, 2009. 94(9): p. 3132-54.

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