The Effect of Gonadotropin Treatment on Insulin Resistance and Cardiovascular Risk Factors in Patients with Idiopathic Hypogonadotropic Hypogonadism

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OBJECTIVES

Idiopathic hypogonadotropic hypogonadism (IHH) is a rare disorder characterized by delayed or absent sexual maturation and infertility associated with inappropriately low gonadotropin and sex steroid levels. Insulin resistance (IR) is defined as an impaired biologic response to both endogenous and exogenous insulin. IR is a common precursor to the development of glucose intolerance, including diabetes, hypertension, and cardiovascular disease. Dyslipidemia, apolipoproteinB-100 (ApoB-100), homocysteine, apolipoproteinA-1 (ApoA1), high sensitive C-reactive protein (hsCRP) are another risk factors on coronary artery disease. We aimed to to look at the role of gonadotropin replacement treatment in development of insulin resistance and other cardiovascular risk factors in patients with IHH.

METHODS

Twenty-four male patients with untreated IHH were enrolled into the study. IR was calculated by the homeostasis model assessment of insulin resistance (HOMA-IR) form. Plasma glucose, insulin, hsCRP, homocystein, ApoA1, ApoB-100, low density lipoprotein-cholesterol (LDL-C), high density lipoprotein-cholesterol (HDL-K), triglycerid (TG), total cholesterol (TC) levels were measured in fasting blood samples, and biochemical and hormonal analyses were performed for all study participants before and after treatment.

Pre and Post-Treatment Laboratory Findings

Parameters	Pre-Treatment (n:24)	Post-Treatment (n:24)	p
HOMA-IR	3.12±1.44	1.98±1.48	0.001
Total cholesterol (mg/dL)	183.12 ± 42.95	156.29 ± 35.56	0.002
HDL-C (mg/dL)	43.70 ± 9.63	40.95 ± 8.51	0.099
LDL-C (mg/dL)	110.86 ± 33.76	91.87 ± 27.62	0.004
ApoA1 (mg/dL)	99.54±16.83	108.07±29.67	0.164
ApoB100 (mg/dL)	154.22±43.10	138.85±64.69	0.355
Homosistein (µmol/L)	13.71±2.78	13.14±2.47	0.436
hsCRP (mg/L)	3.45(3.45-3.45)	3.45(3.45-5.02)	0.577

RESULTS

Before and after gonadotropin replacement, HOMA-IR were 3.12 1.44, 1.98 1.48 and LDL-C levels were 110.8 33.7, 91.8 27.6 mg/dl respectively. There was a statistically significant difference between HOMA-IRs (p=0.001) and LDL-C levels (p=0.004). However, there was no statistically significant differences among other parameters (p>0.05).

CONCLUSIONS

Gonadotropin replacement can significantly improve patient's insulin sensitivity and decrease serum LDL-C levels. Therefore, gonadotropin replacement may prevent developing diabetes mellitus and cardiovascular diseases in future.

References

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