

Metabolic status of ACTH insufficient & ACTH sufficient patients with untreated growth hormone deficiency (GHD): a comparative study

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BACKGROUND

Inadequate glucocorticoid (GC) replacement may be associated with overexposure to GC, which can inversely influence metabolic and cardio-vascular status of patients with hypopituitarism and growth hormone deficiency (GHD).

GH replacement can improve cardio-vascular risk profile by modulating GC exposure.

In this study we compared metabolic status of ACTH insufficient and sufficient hypopituitary patients with untreated GHD.

PATIENTS AND METHODS

A cohort of 260 patients with hypopituitarism and GHD was divided according to ACTH status and analyzed for anthropometric and metabolic parameters including lipid status and glucose metabolism.

In our patients with hypopituitarism ACTH insufficiency was associated with other pituitary hormone deficiencies and was most often caused by operation or irradiation in the sellar region.

All ACTH insufficient patients were replaced with hydrocortisone 10-20 mg/day, divided in two or three daily doses, and other hormone deficiencies were replaced as appropriate. None of the patients was treated with GH. Metabolic syndrome (MetS) was defined using NCEP (3/5) criteria.

RESULTS

Table 1. Prevalence and gender distribution of ACTH deficiency

ACTH suf. n=64 (24.6%)	26 (40.6%) 38 (59.4%)
ACTH def. n=196 (75.4%)	117 (59.7%)** 79 (40.3%)
TOTAL N =260 (100%)	143 (55%) 117 (45%)

** *p* value < 0.001 is considered to be highly statistically significant

Table 2. Parameters of glucose metabolism

Parameter	ACTH suf.	ACTH def.	P value
Glucose baseline (mmol/l)	4.8±0.8	4.5±0.9	0.04
Glucose OGTT peak (mmol/l)	8.6±2.1	7.7±2.0	0.006
Glucose OGTT AUC (mmol/l.min)	851.2±217.8	753.3±197.6	0.002
Insulin baseline (mIU/l)	14.3±10.5	13.9±7.2	NS
Insulin OGTT peak (mIU/l)	92±78.2	97±77.4	NS
Insulin OGTT AUC (mIU/l.min)	6785.3±5278.5	7008.2±5209.9	NS
HOMA IR	3.2±2.7	2.8±1.9	NS

Table 3. Metabolic and anthropometric parameters and prevalence of metabolic syndrome (MetS)

Parameter	ACTH suf.	ACTH def.	P value
Body weight (kg)	78.4 ± 21.2	80.6 ± 19.0	NS
Body mass index (kg/m ²)	28.7 ± 6.6	27.5 ± 5.5	NS
Waist/hip ratio	0.92 ± 0.1	0.93 ± 0.1	NS
Total cholesterol (mmol/L)	6.7 ± 1.4	6.7 ± 1.9	NS
HDL cholesterol (mmol/L)	1.2 ± 0.3	1.2 ± 0.3	NS
LDL cholesterol (mmol/L)	4.4 ± 1.0	4.4 ± 1.4	NS
Triglycerides (mmol/L)	2.3 ± 1.2	2.5 ± 2.0	NS
Lp (a) (mmol/L)	0.2 ± 0.3	0.2 ± 0.3	NS
MetS prevalence (%)	33.9	30.7	NS

Results are presented as mean ± SD,
p value < 0.05 is considered to be statistically significant

CONCLUSION

Adverse metabolic profile in patients with hypopituitarism and GHD is not significantly influenced by ACTH deficiency, when treated with low to moderate doses of hydrocortisone. Glucose levels at baseline and during OGTT are significantly lower in ACTH deficient compared to ACTH sufficient patients with hypopituitarism and untreated GHD.