



Obesity and cardio-metabolic risk factors among children and adolescents with non classical 21-Hydroxylase deficiency



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Introduction

Increased risk of obesity and cardio-metabolic risk factors were reported in patients with classical congenital adrenal hyperplasia but little is known about adiposity among patients with non-classical congenital adrenal hyperplasia (NCCAH).

Objectives

To assess the prevalence of overweight, obesity and cardio-metabolic risk factors among NCCAH patients diagnosed in childhood.

Study design and methods

Design

- A cross-sectional retrospective study conducted in a tertiary pediatric endocrinology unit.

Study cohort

- 114 patients with NCCAH (93 females) aged <18 years at diagnosis.

Clinical evaluation

- Weight, height, blood pressure, bio-impedance, waist and hip circumference, skin folds thickness.
- Fasting glucose, insulin, lipid profile and androgens.

Analyses

- Anthropometric data were compared to their parental measurements.
- Data of patients in grades 7-12 (n=76) were compared to those of the National Health and Nutrition Survey (grades 7-12).
- Currently treated patients were compared to untreated patients (26 previously treated, 11 never treated).

Clinical characteristics of patients with NCCAH at diagnosis

F:M	91:23
Age at diagnosis (yrs)	7.9±4.2
Age at treatment initiation (yrs)	8.6±3.4
1 st year Hydrocortisone dose (mg/m ²)	10.6±4.9
Height-SDS	0.10±1.22
Weight-SDS	0.22±1.23
BMI-SDS	0.35±1.13
Bone age – chronological age (yrs)	1.06±1.26
Basal 17OHP (nmol/l)	28.7±27.6 (2.4-174)
Peak 17OHP (nmol/l)	129.5±96.8
Stimulated cortisol level (nmol/l)	567±165
Paternal BMI	26.7±3.9
Maternal BMI	26.0±5.1

Clinical characteristics by current glucocorticoid treatment

	Treated (n=76)	Untreated (n=38)	P-value
Current age (yrs)	17.4 ± 7.1	16.6 ± 6.5	0.5
F:M	63:13	28:10	0.2
Tanner (1, 2-4, 5)	8, 14, 54	6, 6, 26	0.3
Treatment duration (yrs)	7.3 ± 6.3	6.5 ± 5.2	0.5
Current Weight-SDS	0.39 ± 0.99	0.06 ± 1.29	0.1
Current Height-SDS	-0.44 ± 0.99	-0.42 ± 1.16	0.9
Current BMI-SDS	0.65 ± 0.89	0.34 ± 1.00	0.09
Current daily HC dose (mg/m ²)	9.2 ± 4.5		
Systolic blood pressure (mm Hg)	113 ± 11	116 ± 11	0.3
Systolic BP percentile	61.2 ± 27.1	68.9 ± 24.4	0.2
Diastolic blood pressure (mm Hg)	66.7 ± 9.5	67.9 ± 7.8	0.6
Diastolic BP percentile	56.1 ± 26	60.4 ± 22.5	0.5
17OHP (nmol/l)	22.0 ± 29.5	19.5 ± 17.6	0.7
Androstenedione (nmol/l)	6.4 ± 4.1	9.2 ± 8.3	0.4
Testosterone (nmol/l)	2.5 ± 4.8	1.9 ± 3.1	0.8

Rates of overweight and obesity

	n	Overweight (%)	Obesity (%)
All patients	114	21.9	11.4
National health survey Study cohort (7-12th grade)	3,443 76	26.5 23.5	15.1 10.5
P-value		0.24	0.18
Mothers	100	36.8	13.6
P-value		0.01	0.4
Fathers	86	52.5	14.5
P-value		<0.001	0.3

Cardio-metabolic risk factors by current treatment

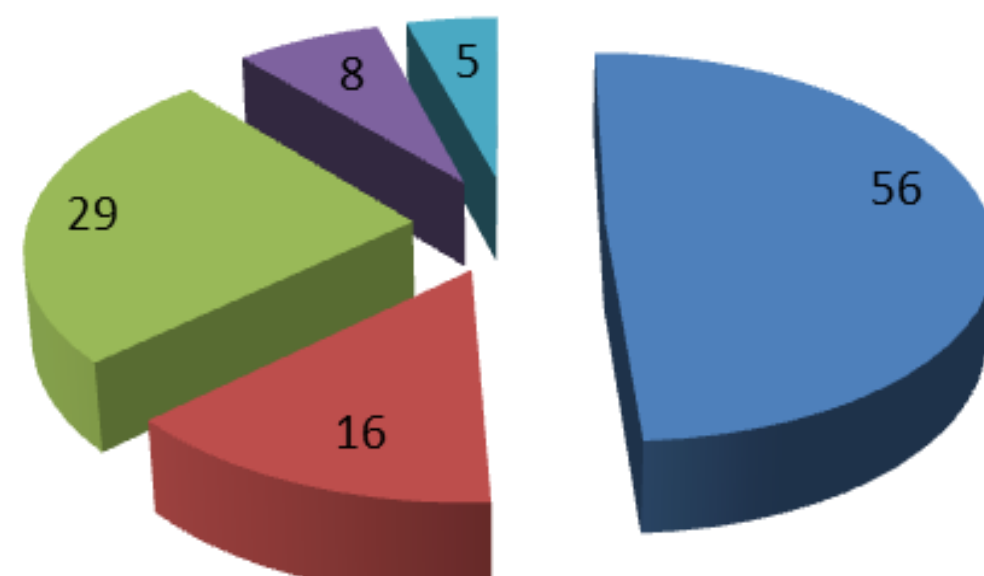
	Treated (n=22)	Untreated (n=16)	P-value
Age (years)	15.7 ± 5.4	17.1 ± 5.7	0.5
%fat by Bioelectrical impedance	27.8 ± 6.8	21.4 ± 8.3	0.02
Iliac skin fold (mm)	16.1 ± 8.9	14.2 ± 7.0	0.5
Triceps skin fold (mm)	18.4 ± 8.7	14.1 ± 6.6	0.1
Scapular skin fold (mm)	13.4 ± 9.6	9.3 ± 6.0	0.2
Waist circumference (cm)	74.1 ± 13.2	67 ± 11.9	0.1
Patients with waist circumference percentile >50 (%)	55.5	33	0.2
Hip circumference (cm)	86 ± 16	79 ± 18	0.28
Waist/Hip ratio	0.88 ± 0.13	0.87 ± 0.09	0.8
HDL (mg/dl)	59 ± 19	57 ± 16	0.6
LDL (mg/dl)	107 ± 33	106 ± 28	0.9
TG (mg/dl)	89 ± 32	118 ± 66	0.07
Cholesterol (mg/dl)	187 ± 48	191 ± 44	0.8
Glucose (mg/dl)	85 ± 14	82 ± 11	0.6
Insulin (micU/ml)	5.6 ± 6.1	3.9 ± 2.7	0.5
HOMA-IR	1.1 ± 1.2	0.8 ± 0.4	0.48

None of the patients were defined as having the metabolic syndrome using IDF consensus criteria, for children and adolescents.

Results

Reason for referral

- Premature pubarche
- Hyperandrogenism
- Family history
- BA advancement
- Clitoromegaly



Effects of dose and duration of therapy

- Treatment duration was not associated total-, HDL-, and LDL-cholesterol, triglycerides, fasting glucose, HOMA-IR, skin folds thickness or body fat mass.
- Hydrocortisone dose during the 1st year of therapy was associated with slightly higher systolic and diastolic blood pressure.
- Current HC dose was associated only with higher LDL-cholesterol levels ($r=0.46$, $p<0.05$).

Conclusions

- NCCAH diagnosed in childhood (treated or untreated) is not associated with increased risk of overweight, obesity or metabolic derangements.
- Hydrocortisone dose but not therapy duration may be associated with adverse metabolic effect.
- Larger, long-term studies are needed to confirm our results.

Authors have nothing to disclose

P1-P002

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Adrenals and HPA Axis

Liat de Vries

Poster presented at:

