Long-term Prednisone versus Hydrocortisone Treatment in Children with Classic Congenital Adrenal Hyperplasia (CAH): A Controlled Study

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No conflict to report among authors.

Introduction

• Debate still exists about the safety of long-term use of Prednisone (PD) versus Hydrocortisone (HC) for treating children with CAH.

• The mechanism by which glucocorticoid therapy interferes with growth is complex and multifactorial.

• Relatively slight supraphysiologic levels may be enough to blunt growth velocity, increase weight gain.

Objectives

• To evaluate the anthropometric and biochemical effects of long-term PD versus HC treatment in children with CAH-21OHD.

Methods

• We studied 30 children with classic CAH (19 females and 11 males), 22 were on PD and 8 were on HC treatment, since their first diagnosis.

• Clinical data included age, gender, duration of therapy, the dose of HC and or equivalent dose of HC in the PD group, blood pressure, height (Ht) and weight. Ht-SDS and BMI were also calculated.

• Biochemical data included measurement of 17-OH progesterone, cholesterol, triglycerides (TG), HDL, LDL, fasting glucose, and insulin concentrations. HOMA-IR was calculated.

• Carotid intima-media thickness (CIMT) was measured using high-resolution B-mode ultrasonography.

• Thirty normal age-matched children were used as controls for the anthropometric and CIMT data.

Results

• The age of children and duration of treatment did not differ among the two treatment groups. After a mean of 6 years of treatment, the Ht-SDS and BMI did not differ between the three groups of children.

• The equivalent hydrocortisone dose of children on prednisone was significantly **Higher** than the dose for the hydrocortisone group.

• Both systolic and diastolic blood pressures (BP) of children on prednisone was slightly higher compared to those on the HC group. However, the BP of the 2 treatment groups was not different compared to control children.

Comparison of different variables between cases of CAH and controls

Variables	Type of steroid treatment			P 1*	p2 *
	HC	PD	Control		
	(n = 8)	(n = 22)	n =30		
Age at presentation (mon)	3.9	6.7	4.5	0.2	0.3
Age (years)	7.4	6.4	6.2	0.37	0.51
Systolic BP mmHg	96.5	98.5	97.4	0.01	0.82
Diastolic BP mmHg	61.3	63.9	63	0.01	0.67
WtSDS at presentation	-0.99	-1.1	-0.5	0.4	0.12
Height SDS (± SD)	-0.3	-0.7	-0.25	0.25	0.24
BMI (kg/m^2)	19.0	18.7	19.8	0.57	0.39
Total daily dose (mg/m^2/day)	**15.2**	**5.5**	**ND**	**<0.001#**	**ND**

P1: Hydrocortisone versus Prednisone;
P2: Patients versus controls

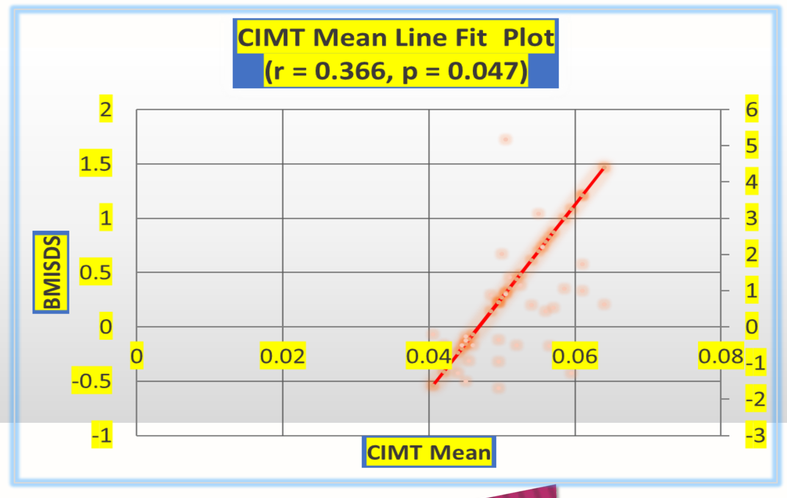
• Fasting blood glucose, HOMA-IR, plasma TG, HDL, and cholesterol did **Not** differ among the two treatment groups.

• LDL levels were significantly **Higher** in the PD group versus the HC group.

• CIMT did **Not** differ among the two treatment groups but was significantly higher in the treated groups versus controls.
• There was a significant linear correlation between BMI-SDS and CIMT (r= 0.37, p = 0.047).

Comparison of different variables between cases of CAH and controls

Variables	Type of steroid treatment			P 1*	p2 *
	HC	PD	Control		
	(n = 8)	(n = 22)	n =30		
17- OH progesterone nmol/L	26.8	3.0	ND	*0.00*	ND
Cholesterol mg/dL	144.5	162.0	ND	0.06	ND
TG mg/dL	69.1	74.1	ND	0.65	ND
HDL mg/dL	53.5	55.1	ND	0.69	ND
LDL mg/dL	72.9	91.3	ND	0.04	ND
Fasting glucose mg/dL	73.8	73.9	ND	0.97	ND
HOMA-IR	1.1	1.2	ND	0.73	ND
CIMT Mean (mm)	**0.54**	**0.51**	**0.044**	**0.21**	**<0.001#**



Conclusions

• No difference in HtSDS, BMI, HOMA-IR, or CIMT was detected among the two treated groups.

• The efficiency, safety and convenience of a single daily dose of PD could be a good and relatively safe alternative to HC for the continuing treatment of CAH children.