

BACKGROUND

- Annual incidence of 0.71 per 100,000
- In both adults and adolescents, female sex and obesity are strongly associated, however, this is not true in prepubertal children
- Few case studies suggest that adrenal function may be involved, yet no large study has examined this relationship.

PURPOSE

To examine the prevalence of adrenal insufficiency (AI) and glucocorticoid use in pediatric patients with IIH seen at a large referral center.

METHODS

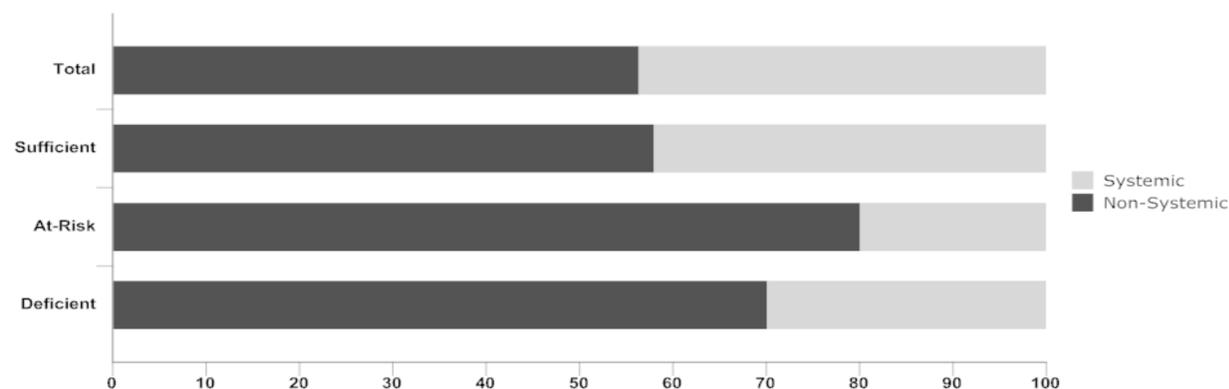
- Single-center, retrospective cohort study
- Based on ICD-10 diagnostic codes, all children with IIH between Jan 2010 and Sep 2019 and an available cortisol level
- Those not meeting the revised PTCS diagnostic criteria were excluded
- Based on cortisol level subjects were classified into :
 - **Deficient** if peak stimulated cortisol <16 µg/dl or AM cortisol <5 µg/dl
 - **At-Risk** if peak stimulated cortisol 16-20 µg/dl, AM cortisol 5-13 µg/dl or random <13 µg/dl
 - **Sufficient** peak stimulated cortisol >20 µg/dl, or AM or random cortisol >13 µg/dl.
- Two-sample Z-tests (categorical) or T-tests (continuous)
- Multivariable models were run using penalized logistic regression

Table 1. Sample Characteristics by Groups of Adrenal Function Tests

Characteristic	Interpretation of Cortisol Test, (%)		
	Sufficient (n= 16)	At-Risk (n= 33)	Insufficient (n= 15)
Age at diagnosis, years			
Mean (SD)	11.1 (4.0)	11.2 (5.2)	9.9 (4.8)
Male Sex	3 (18.8) ^C	13 (39.4)	10 (66.7) ^A
Race			
African-American	2 (12.5)	9 (27.3)	1 (6.7)
Asian	1 (6.2)	2 (6.1)	
Hispanic white	2 (12.5)	5 (15.2)	3 (20)
Non-Hispanic white	11 (68.8)	17 (51.5)	11 (73.3)
BMI, z-score mean (SD)	1.7 (0.9)	1.3 (1.4)	0.9 (1.5)
History of asthma	2 (12.5) ^A	6 (18.2) ^A	8 (53.3) ^{B, C}
History of prolong use of steroids	7 (43.8) ^A	5 (15.2) ^{A, C}	10 (66.7) ^B
Steroids route			
Non-systemic only	4 (57.1)	4 (80)	7 (70)
Systemic only	2 (28.6)	-	2 (20)
Mixed	1 (14.3)	1 (20)	1 (10)
Cortisol test			
AM	5 (31.2)	14 (42.4)	6 (40)
Random	4 (25)	16 (48.5)	
ACTH stimulation	7 (43.8) ^B	3 (9.1)	9 (60) ^B
Time relative to diagnosis			
Before	4 (25)	7 (21.2)	2 (13.3)
Same Day	1 (6.2)	1 (3.0)	-
After	11 (68.8)	25 (75.8)	13 (86.7)
Treatment with glucocorticoids	4 (25) ^C	2 (6.1) ^C	9 (60) ^{A, B}

Letters A (sufficient), B (at-risk), and C (insufficient); denote statistically significant difference (P=<0.05) between groups

Figure 1. Distribution of glucocorticoid route for those with prolonged use by adrenal function test categories.



RESULTS

- 387 subjects included, N=64 after chart review
- 40.6% male, of mixed ancestry with a mean age of 10.5 (SD 4.7) years
- 34% had had prolonged glucocorticoid use prior to diagnosis
- Multivariable analyses controlling for age, race, BMI and time between cortisol test and IIH diagnosis:
 - Male sex were more likely to have an insufficient cortisol test when compared with the at-risk (P=<0.001), but not when compared against the sufficient group.
 - Those with asthma were most likely to have insufficient cortisol test results when compared to those in the at-risk (P=<0.001) and normal (P=<0.001) groups.
 - Prolonged exposure to steroids was associated with cortisol test results when comparing the insufficient to the at-risk group (P=<0.001), and insufficient to sufficient group (P=0.028) but not when comparing the at-risk and sufficient groups.

CONCLUSION

- Hypocortisolism and corticosteroid use are highly prevalent in children with IIH, most were on non-systemic forms of these medications.
- Children with IIH, particularly; young, male, and non-obese, should be evaluated conscientiously for AI and factors predisposing to AI
- Prospective and multicenter studies are in need to further establish the real dimension and role of HPA axis in pediatric PTCS.