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Growth of children with congenital adrenal hyperplasia during the first 2 years of life – data from the Dutch longitudinal registry

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Introduction

A national database has been developed to register longitudinal data from all children with congenital adrenal hyperplasia (CAH) detected through the Dutch neonatal screening program from 2002 onwards. So far longitudinal data of 105 children have been registered (roughly 65% of Dutch CAH patients) to evaluate medical treatment and long term effects in CAH.

Aims

To evaluate height and weight and the associations with medication in the first 2 years of life.

Methods

Biometric data and medication dosage were available at timepoints 0, 6, 12 and 24 months. Linear mixed model analyses with manual backward selection were performed. Separate analyses were done for height, weight and weight for height. Height was expressed as height standard deviation scores (SDS) corrected for target height SDS (HSDS – THSDS)

Table 1: medication dosage first 2 years

T in years	Hydrocortisone (mg/ day) Median (IQR)	Fludrocortisone (mcg/ day) Median (IQR)	NaCl (mg) Median (IQR)
T 0,5	4 (2) [89]	93.75 (37.5) [82]	500 (400) [46]
T 1	4 (1) [88]	62.5 (30.3) [84]	375 (400) [25]
T 2	5.4 (2.14) [84]	62.5 (37.5) [78]	-

Median (IQR) [n]
IQR = interquartile range

Results

The tables show medication dosages and biometric data of the first 2 years.
Mixed model analyses showed:
• HSDS-THSDS showed a small decrease of -0.019 SDS/month (95%CI -0.031 - -0.006; p 0.004) in the first 2 years
• Height deficit of - 0.456 SDS for CAH children at 2 years of age.
• HSDS-THSDS was positively associated with hydrocortisone (HC) and fludrocortisone (FC) dosage at t=2 years only.
•SDS weight for height showed a decline of -0.027 SDS/month (95%CI -0.046 - -0.009; p 0.04) with HC and FC dosages in the first 6 months being negatively associated with the outcome (HC -0.176 SDS/month (95%CI -0.361 - 0.009; p 0.062) (FC -0.011 SDS/month (95%CI -0.017 - -0.004; p 0.002)
•At t=2 years, FC was positively associated with SDS weight for height.
•In addition, birth weight and parental height seemed to have positive and negative associations with growth, respectively.

Table 2: biometric data

T in years	HSDS-TH SDS	SDS_height	SDS_weight	SDS_weight for height
0,5	-0.074 (-2.95-2.52; 1.19)	-0.258 (-3.45-2.15; 1.25)	-0.040 (-3.86-4.12; 1.4)	0.21 (-3.08-3.38; 1.12)
1	-0.347 (-7.16-1.79; 1.37)	-0.332 (-4.2-1.5; 1.02)	-0.515 (-4.63-2.83; 1.26)	-0.243 (-2.85-3.8); 1.21)
2	-0.441 (-2.68-1.71; 1.04)	-0.52 (-3.43-1.4; 1.09)	-0.736 (-2.9-3.97; 1.31)	-0.50 (-3.43-1.4; 1.09)

All data showed virtually normal distributions; Data are presented as: Mean (min – max; sd)

Conclusion

Preliminary results show a decreasing HSDS-THSDS and a decreasing SDS weight for height in the first 2 years of life without a clear association with medication dosage, except for the hydrocortisone and fludrocortisone dosages at t=2 years. This probably reflects a higher medication dosage adjusted to growth, rather than a true positive effect on growth. Medication seems to have a negative effect on SDS weight for height in the first 6 months . Further exploration in detail might reveal how dosage regimen affects growth.

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