A female infant with severe salt-wasting due to aldosterone synthase deficiency, initially mimicking adrenal insufficiency

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Introduction

We report the case of a female infant with severe salt-wasting due to aldosterone synthase deficiency (ASD), initially mimicking adrenal insufficiency.

ASD is a rare autosomal recessive disorder due to mutations in the *CYP11B2* gene. Symptoms are hyperkalemia, salt loss, vomiting, dehydration, and failure to thrive.

Newborn at day 12 of life – episode of severe salt wasting in a pediatric county hospital

	level	normal range
Sodium	109 mmol/l	135-145 mmol/l
Potassium	6.9 mmol/l	3.5-4.5 mmol/l

The patient showed weight loss of 9% compared to birth weight.
Acute adrenal insufficiency was diagnosed and therapy with hydrocortisone (initially 10 mg/kg/d) and fludrocortisone (0.04 mg/kg/d) as well as salt was started.
No prior evaluation of ACTH and cortisol was performed due to the emergency character of the situation.

At age 1 month

Patient was referred to our institution for further diagnostic workup:

ACTH stimulation test (morning before medication):

Stimulated cortisol: 3.6 µg/dl

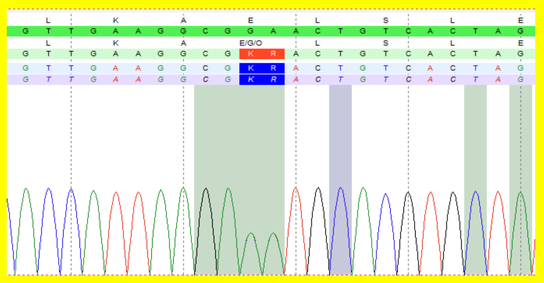
Primary adrenal insufficiency was suspected.

Plasma and urinary steroid profiles without evidence for congenital adrenal hyperplasia.

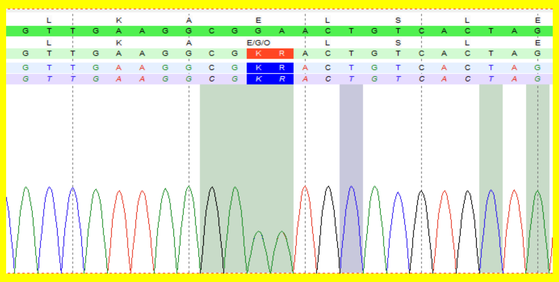
Diagnostics continued

Repeated levels of ACTH and cortisol (morning before medication) were normal.
Plasma renin activity was elevated under fludrocortisone treatment and dosage had to be adapted.
⇒ Isolated deficiency of mineralocorticoid biosynthesis was suspected

Molecular genetic analysis



p.Glu298X



p.Arg421Pro

Two mutations in the *CYP11B2* gene (aldosterone synthase) could be detected

The two mutations c.892_893delinsTG; p.Glu298X and c.1235G>C; p.Arg421Pro have not been described before.
The parents are both heterozygous carriers for the mutations.

Final workup and follow-up

A second ACTH stimulation test showed a normal rise of cortisol level (23.8 µg/dl).
Sufficiency of ACTH-cortisol axis was proven and hydrocortisone treatment was discontinued.
Urinary steroid metabolome analysis by GC-MS showed ASD type I (CMO I defect).
Our patient is developing well under fludrocortisone treatment.

Conclusions

The need for sampling of plasma and urine for the determination of the decisive endocrine parameters is strongly recommended before starting emergency hydrocortisone therapy.

We detected two novel mutations in the *CYP11B2* gene (p.Glu298X and p.Arg421Pro) leading to aldosterone synthase deficiency.

The authors have nothing to disclose.