

What can a tissue measured steroid metabolome tell about adrenal tumor?

A tissue steroid analysis of cortisol producing adenoma and an androgen producing adenoma in a second patient with CAH, 21-hydroxylase deficiency.

Hána V. jr.¹, Kosák M.¹, Hána V.¹, Michalský D.², Hill. M.³

¹3rd Department of Internal Medicine, 1st Faculty of Medicine, Charles University and General Teaching Hospital in Prague

²First Department of Surgery, 1st Faculty of Medicine, Charles University and General Teaching Hospital in Prague

³Institute of endocrinology, Prague

Case 1

30-year-old woman with ACTH independent Cushing syndrome

- first sign amenorrhea, then weight gain 16kg, „round“ face, bruises, weakness of lower limbs, striae
- Cortisol profile 7h, 13h, 19h, 1h, 7h
748, 775, 926, 874, 867 nmol/l
- UFC: 1453, 3051 nmol/day (n < 208)
- 2mg DXM test: cortisol 1015 nmol/l
- ACTH 1.5 ng/l
- on CT adenoma of the left adrenal 35×30×38 mm

Table 1: prevailing tissue concentration highlighted in color

nmol/l, if not stated analyzed by GC-MS	serum	adrenal	tumor
Pregnenolone [0,8-4,1]	33	2000	2470
17-OH-pregnenolone	52	250	3740
Progesterone [0,1-1,0]	1,7	149	91
17-OH-progesterone	40	171	313
DHEA [4,9-23,0]	12	26	411
DHEAS [890-3000]	250	65	210
Androstendione [2,1-6,2]	5,5	26	318
Testosterone [0,6-1,7]	0,6	0,8	14
Androstenediol	0,228	1,45	25,7
Cortisol (RIA)	680	1612	6763
Allopregnanolone	0,0451	0,196	2,09
Isopregnanolone	1,88	91	109
Pregnanolone	0,132	0,547	0,76
Epipregnanolone	0,0673	0,093	0,55
Androsterone	0,2	0,707	0,21
Epiandrosterone	0,531	1,38	17,7
Etiocholanolone	0,215	0,105	0,28
Epietiocholanolone	0,011	0,04	0,11
5α-Androstane-3α,17β-diol	0,01	2,01	8,9
5α-Androstane-3β,17β-diol	0,037	0,931	22
5β-Androstane-3α,17β-diol	0,166	0,773	18,6
5β-Androstane-3β,17β-diol	0,008	6,29	7,76

Case 2

65-year-old woman with CAH, 21-hydroxylase deficiency, operated for an androgen producing adenoma of the right adrenal

- 4 years history of androgenic alopecia, hirsutism, in a patient with confirmed 21-hydroxylase deficiency
- bilat. adrenal tumor, right 40×30×30mm, left 30×25×20mm
- sonography of both ovaries was normal
- norcholesterol scintigraphy showed uptake in the right adrenal

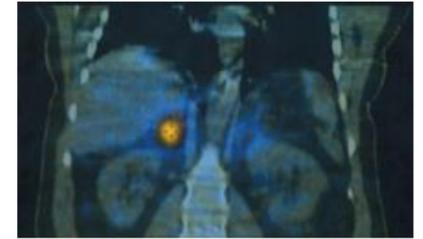
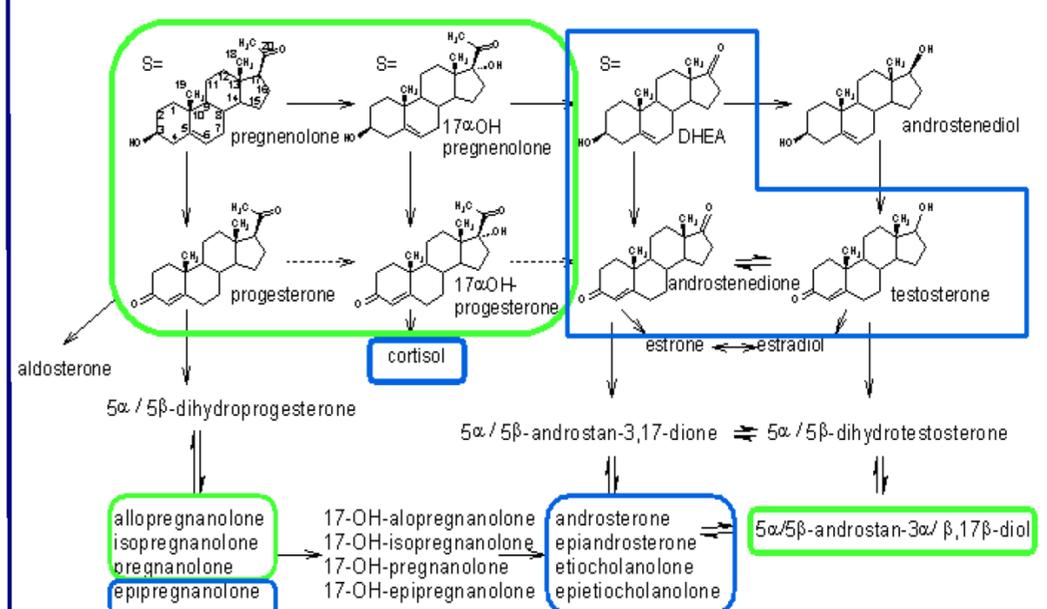
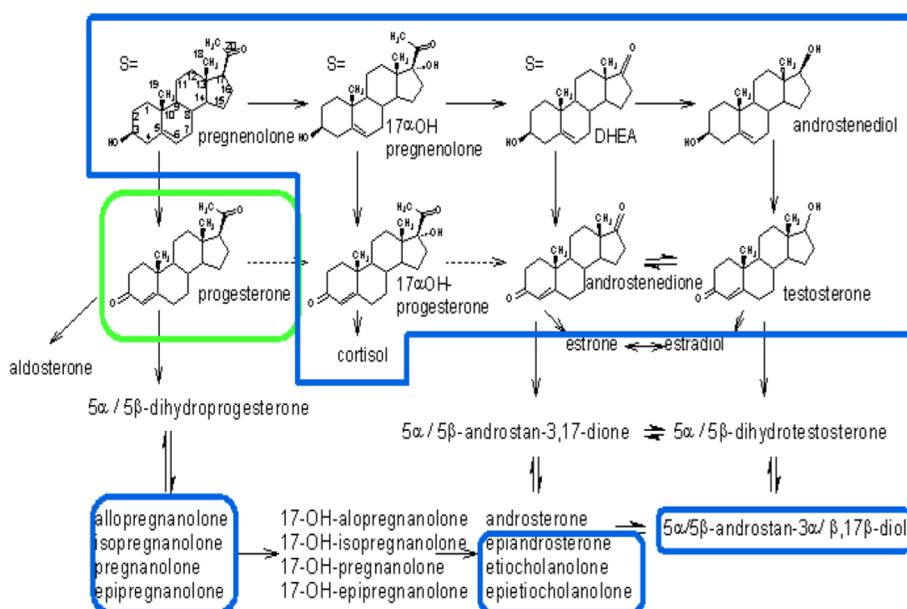


Table 2: prevailing tissue concentration highlighted in color

nmol/l, if not stated analyzed by GC-MS	serum	adrenal	tumor
Pregnenolone [0,8-4,1]	4,9	12700	6240
17-OH-pregnenolone	49	6580	4590
Progesterone [0,1-1,0]	1,5	775	419
17-OH-progesterone	108	9260	4890
DHEA [4,9-23,0]	15,5	2700	3880
DHEAS [890-3000]	1300	1750	1880
Androstendione [2,1-6,2]	68,5	900	2540
Testosterone [0,6-1,7]	9,1	17,8	63,5
Androstenediol	1,19	53,5	41,7
Cortisol (RIA)	360	1582	2439
Allopregnanolone	0,209	2,19	1
Isopregnanolone	0,314	542	273
Pregnanolone	0,317	0,755	0,505
Epipregnanolone	0,105	2,92	7,04
Androsterone	1,14	15,1	53,4
Epiandrosterone	0,836	116	221
Etiocholanolone	0,176	1,14	1,44
Epietiocholanolone	0,0142	0,208	0,383
5α-Androstane-3α,17β-diol	0,176	11,4	3,54
5α-Androstane-3β,17β-diol	0,0627	25,1	7,55
5β-Androstane-3α,17β-diol	0,353	20,4	6,8
5β-Androstane-3β,17β-diol	0,0038	10,1	3,38



Conclusion: In the patient with CAH, there is reduced activity of the C17α-hydroxylase step and elevated activity of the C17,20 lyase step in CYP17A1 of the tumoral tissue as compared to the adrenal one.

In the patient with cortisol producing adenoma, the CYP17A1 activity is elevated in both CYP17A1 steps.

This work was supported by the grant GAUK 160415 Charles University, Prague