中文題目：17 alpha-hydroxylase/17, 20-lyse 酵素缺乏所導致之先天性腎上腺增生症: 病例報告

英文題目：Congenital adrenal hyperplasia due to 17 alpha-hydroxylase/17, 20-lyse deficiency : A case report

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Background : 17a-Hydroxylase deficiency (17OHD) is a rare disease of congenital adrenal hyperplasia. It is characterised by hypertension, hypokalaemia, primary amenorrhoea. Deficiency of P450c17 enzyme is caused by mutation of the CYP17 gene.

Methods(Case): A 42-year-old woman presented with acute onset quadriparesis for five days. She denied of any medication before this episode, nor trauma or severe exercise. She had hypertension without medication control. Otherwise, she had infertility and primary amenorrhea, and undeveloped uterus was told by her GYN doctor. At emergent department, laboratory evaluation revealed hypokalemia (2.8 mmol/L) with metabolic alkalosis and elevated myoglobulin. Under impression of hypokalemia related rhabdomyolysis, she was admitted to Endocrine department. On physical examination at ward, she had normal female external genitalia with a normal hymen. Breast and pubic hair development were Tanner stage I. She was 161 cm tall and weighed 48 kg. Her blood pressure was 163/81 mmHg at the first visit. Further laboratory showed that plasma cortisol(0.4 ug/dl at 8 o'clock in the morning) , testosterone(< 0.08ng/ml) and estrogen(10.18pg/ml) were decreased. Plasma ACTH(49.6 pt/ml) was elevated. Plasma renin activity was normal. Follicle stimulating hormone and luteinizing hormone were elevated. Abdominal CT showed bilateral adrenal hyperplasia. Karyotype analysis was46,XX. Congenital adrenal hyperplasia(CAH) due to 17 alpha hydroxylase/17,20-lyase deficiency was impressed.

Result and discussion : CAH comprises a group of autosomal recessive disorders caused by deficient adrenal corticosteroid biosynthesis. It results from defects in one of the steroidogenic enzymes involved in cortisol biosynthesis or in the electron-providing factor, P450 oxidoreductase (POR). As one of the crucial enzymes in steroid hormone biosynthesis, cytochrome P450c17 performs both hydroxylation and lyase activities, by converting pregnenolone/progesterone to 17-hydroxypregnenolone /progesterone(17 alpha-hydroxylase) and cleaving the latter to yield the prcursors of estrogens and androgens (17,20-lyase). The enzyme is expressed in adrenal zona fasciculata and zonareticularis as well as gonadal Leydig and theca cells. Patients with 17-hydroxylase deficiency (17OHD) fail to produce gonadal steroids, resulting in sexual infantilism, primary amenorrhea in females (46XX), and pseudohermaphroditism in males (46XY). Moreover, reduced production of glucocorticoids in turn increases ACTH secretion, which leads to enlargement of bilateral adrenal glands andstimulates the overproduction of mineralcorticoids, causing severe hypertension and hypokalemia.

The diagnosis of 17 alpha-hydroxylase/17, 20-lyse deficiency depends on clinical presentation, and hormone test, including increased progesterone(the substrate for CYP17), lower Cortisol, 17-hydroxy progesterone, estradiol, and testosterone , elevated ACTH, FSH and LH. The diagnosis is confirmed when there is an increase in circulating levels of progesterone, corticosterone and DOC at 5 to 10 times the normal value after ACTH stimulation test.Treatment was based on hormone replacement. Glucocorticoid was first used to suppress ACTH production, and leading to decreased DOC and corticosterone accumulation and normalization of serum potassium and blood pressure. The potassium levels, renin activity and ACTH is useful in the follow-up of treatment.