Preclinical Cushing’s Syndrome and Circadian Rhythm of Blood Pressure

Incidentally discovered adrenal masses have become a common clinical problem as a result of the more widespread use of computed tomography, magnetic resonance imaging and ultrasound (1). These incidentalomas of the adrenal gland are usually asymptomatic (1). The majority of these tumors are benign and nonhypersecretory. However it is important to distinguish truly nonfunctioning tumors from those that secrete adrenal hormones in amounts insufficient to cause clinically apparent disease. Cortisol production by asymptomatic adrenal tumors are observed in about 10% of these adrenal incidentalomas (1–3). Such patients with cortisol-producing adrenal incidentalomas and without clinical evidence of Cushing’s syndrome are called adrenal preclinical Cushing’s syndrome (1–3).

In the diagnostic criteria for preclinical Cushing’s syndrome, single-dose (1 and 8 mg) overnight dexamethasone suppression tests are useful for the demonstration of autonomic secretion of cortisol (4). As a morpho-functional examination, a decrease in radiocholesterol uptake on the non-tumor side adrenal gland without dexamethasone suppression also indicates autonomic secretion of cortisol from the adrenal tumor and inhibition of ACTH secretion (2, 4). Age- and sex-matched plasma DHEA-S levels are also useful to estimate inhibition of plasma ACTH levels. Usually venous sampling is not necessary for the diagnosis.

In cases of typical adrenal Cushing’s syndrome, the hypothalamic pituitary-adrenal (HPA) axis recovers about 1 year after adrenal adenomectomy. However, in cases of preclinical Cushing’s syndrome, the HPA axis recovers earlier. Some patients do not need replacement therapy after surgery under careful observation except for stress condition. An adrenal scintigraphy and a CRH test are useful to estimate post-operative adrenal insufficiency and evaluate whether replacement therapy is necessary or not.

In overt Cushing’s syndrome, hypertension is observed in 80–90% of the cases and often shows a non-dipper pattern (nocturnal hypertension) as a result of disappearance of circadian rhythm of plasma cortisol levels (5). Glucocorticoid-induced hypertension is thought to be the result of Na- and water-retention, enhancement of actions of angiotensin II and catecholamines, and a direct effect of glucocorticoids on the vascular smooth muscle cells. However, general obesity, hypertension and glucose intolerance are considered as non-specific findings of Cushing’s syndrome. In some patients with Cushing’s syndrome their body weight decreases due to a poor appetite in the glucocorticoid-induced depressive state. In addition, aged patients with overt Cushing’s syndrome sometimes do not show typical clinical findings.

In a survey of preclinical Cushing’s syndrome in Japan in 1994 (6), these tumors were uncommon in patients under the age of 30 year, and their prevalence was found to increase with age. Circadian rhythm of plasma cortisol was observed in 44% of the cases. Hypertension and obesity were found in about 50% of the cases in this survey. Such hypertension, obesity and glucose intolerance may improve after surgery. In the case described in this journal, the normal circadian rhythm of blood pressure was shown in a patient with preclinical Cushing’s syndrome (7).

See also p 528.

This is interesting data and if emphasizes the need for care of nocturnal hypertension in cases of preclinical Cushing’s syndrome, because some cases of this syndrome show only abnormal nocturnal levels of plasma cortisol (>5 μg/dl).

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References