

## 유지 혈액투석 환자에서 부신피질자극호르몬검사 방법에 따른 부신기능저하증 발생 빈도

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최명진, 윤종우, 류지원, 이영기, 오지은, 김성균, 김형직, 구자룡, 노정우

### Prevalence of Adrenal Insufficiency and Method of ACTH Stimulation in Chronic Hemodialysis Patients

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**Background:** The clinical manifestation of chronic adrenal insufficiency(AI) is usually insidious and vague, and the diagnosis could be delayed and missed. These nonspecific symptoms and signs of AI are also common among chronic hemodialysis (HD) patients. Although considered hormonal derangement with the worsening of kidney function and possibility for previous steroid exposure, prevalence of AI in HD patients has not been studied. There are two methods of ACTH stimulation test according to the stimulation of standard or low adrenocorticotropin dose. Standard high dose of ACTH stimulation has been usually used to detect AI. But there were some debate that it may not detect partial AI and have a limitation to detect AI in critical patients including ICU care because of its supraphysiologic stimulation. It is not known which methods is better to detect AI in chronic HD patients.

**Method:** Twenty-eight HD patients with symptoms and signs of chronic AI were enrolled. Both of low dose (1 mcg) and standard high dose (250 mcg) adrenocorticotropin stimulation test (ACTH) were performed at 1 week interval to evaluate AI. A normal response was a rise in serum cortisol concentration to a peak of  $\geq 18$  mcg/dL to both 1 mcg and 250 mcg ACTH stimulation tests.

**Results:** Of the 28 patients, 42.9% were male and the mean age was  $58.3 \pm 1.7$  years. The etiology of renal failure comprised 16 diabetes, 3 hypertensives and 1 glomerulonephritis. Ten patients had previous history of steroid exposure. The common clinical presentations were intradialytic hypotension (n=16), tiredness (n=15), constipation (n=15) and myalgia (n=14). Twenty-one (75.0%) patients showed abnormal cortisol response to low dose ACTH stimulation test, and 13 (46.4%) patients were present in high dose ACTH stimulation test. HD duration was longer in abnormal response patients than normal response patients ( $107.8 \pm 90.2$  month vs  $38.6 \pm 27.9$  months  $p=0.045$ ). There were no significant differences in other baseline characteristics among patients with and without AI.

**Conclusion:** Adrenal insufficiency is common in chronic HD patients with nonspecific symptoms and signs including intra-dialytic hypotension. In these cases, low dose (1 mcg) ACTH stimulation test may be more useful than standard (250 mcg) ACTH stimulation to recognize AI. High suspicion and a confirmatory test may help to detect a patient with unrevealed AI in chronic HD patients.

**Key Words:** 혈액투석, 부신기능저하증, 부신피질자극호르몬검사 방법  
Hemodialysis, Adrenal insufficiency, ACTH stimulation test