KSN 2016 Abstract Submission

Dialysis

KSN2016ABS-1280

Adrenal insufficiency is highly prevalent and may be associated with intradialytic hypotension in chronic hemodialysis patients

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Background: Many maintenance hemodialysis (HD) patients had been chronically exposed to pharmacologic dose of glucocorticoids for the treatment of underlying kidney disease or various coexisting disease. Accordingly, there is high possibility of the hypothalamic-pituitary-adrenal axis suppression resulting in adrenal insufficiency(AI). Physiologically, glucocorticoid modulates vascular smooth muscle tone by their permissive effects in potentiating vasoactive responses to catecholamine. In view of above consideration, we evaluated prevalence, risk factor and clinical impact of AI as a possible cause of intradialytic hypotension (IDH) in chronic HD patients.

Methods: Among 106 eligible maintenance HD patients, 10 patients on current steroid treatment were excluded and remaining 96 patients (age 62.7±13.9 year, diabetes 59.4%) were studied. Adrenal function was evaluated during HD by standard high dose ACTH stimulation test, which measures serum cortisol immediately before, 30 and 60 minutes after intravenous injection of 250 μg of ACTH (cosyntropin). AI was defined by baseline serum cortisol<10 μg/dL and ACTH stimulated maximal serum cortisol<18 μg/dL. Status about previous steroid exposure was identified through the evaluation of medical record and history about underlying or coexisting disease, medications and injections. IDH was defined by KDOQI criteria (symptomatic decrease in systolic BP≥20 mmHg) and the mean number of IDH event during 6 consecutive HD sessions was calculated. In selected IDH patients with AI who agreed to steroid replacement, the change in the incidence of IDH before and after steroid treatment was ascertained.

Results: The prevalence of AI was 36.5% (73.5% in 34 patients with previous steroid exposure history vs 16.1% in 62 patients without steroid exposure history, p<0.001). There was no difference in the prevalence of AI according to the type of underlying kidney disease (diabetes 32.0%, glomerulonephritis 40.5%, others 44.4%, p=0.624). However, the patients with coexisting rheumatologic disease (gout, osteoarthritis, connective tissue disease) had significantly higher prevalence of AI as compared with the patients without coexisting disease (81.3% vs 20.6%, p<0.001). Thirty-three (34.4%) patients had one or more (mean 2.30±1.13) IDH event during 6 consecutive HD sessions. The proportion of patient with one or more IDH event was significantly higher in the patients with AI as compared with the patients without AI (48.6% vs 26.2%, p=0.027). Moreover, in 10 IDH patients with AI who treated by steroid, IDH occurred in only 3 patients after 4weeks of steroid replacement (mean IDH event during 6 HD sessions, 1.90±0.74 vs 0.30±0.48, p<0.001).

Conclusion: In maintenance HD patients, AI is highly prevalent and may be associated with IDH. Careful evaluation of medical record and history about coexisting disease, medications, and injections is required to find out underlying AI. Steroid replacement may be a therapeutic option in IDH patient with AI.
Table:

Keywords: adrenal insufficiency, hemodialysis, intradialytic hypotension