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Prevalence and risk factors of baclofen neurotoxicity in patients with severe chronic kidney disease

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Objectives: Baclofen neurotoxicity has been overlooked for a long time. Baclofen can cause symptoms such as encephalopathy, respiratory failure, and unconsciousness when administered without reducing the dose in patients with acute kidney injury or chronic kidney disease. It is necessary to understand the characteristics of baclofen neurotoxicity and to adjust the dose according to the kidney function.

Methods: We retrospectively studied 401 patients with chronic kidney disease stage 4, stage 5, and on dialysis who were treated with baclofen at Asan Medical Center from January 1, 2006 to December 31, 2016. We reviewed the patient's medical records and obtained information on neurotoxicity, baclofen dosage, therapeutic dialysis, baseline disease, laboratory results, and analyzed the prevalence and risk factors of baclofen neurotoxicity using SPSS Statistics version 20.

Results: The prevalence of baclofen-induced neurotoxicity in patients with severe chronic kidney disease was 7.0% (28 of 401). There was no significant difference in the presence of neurotoxicity when the patients were classified as chronic kidney disease stage 4, stage 5, and dialysis patients. There were significant differences in serum albumin and the presence of diabetic nephropathy between the patients with neurotoxicity and those without. Multiple logistic regression analysis showed that serum albumin was independently associated with baclofen neurotoxicity (p=0.007). When patients with neurotoxicity (28 patients) were analyzed, mental change was present in 26 patients (92.9%). The minimum daily dose for baclofen neurotoxicity was 10 mg, 10 mg and 5 mg in patients with chronic kidney disease stage 4, stage 5, and dialysis, respectively.

Conclusions: In this study, the prevalence of baclofen-induced neurotoxicity in severe chronic kidney disease patients was 7.0%, and serum albumin was identified as an independent risk factor for neurotoxicity. It may be recommended to start with a daily 7.5 mg in stage 4 & stage 5, and 2.5 mg in dialysis patients.

Table 1. Multivariate logistic regression analysis of factors associated with the presence of neurotoxicity

Factors	OR (95% CI)	*p*
DM nephropathy	1.98 (0.86-4.55)	0.107
Albumin (g/dL)	0.43 (0.24-0.80)	0.007

OR: odds ratio, CI: confidence interval

DM: diabetes mellitus

Table 2. Baclofen dose according to the CKD stages in the patients with neurotoxicity

Baclofen	Stage IV n=9 (32.1%)	Stage V n=7 (25.0%)	Dialysis n=12 (42.9%)	*p*
Daily dose (mg)	10.0 (10.0, 20.0)	12.5 (10.0, 20.0)	10.0 (5.0, 20.0)	0.557
Duration of medication (days)	2.0 (1.0, 10.0)	2.0 (1.0, 4.0)	1.5 (1.0, 6.0)	0.837
Total dose (mg)	20.0 (10.0, 150.0)	30.0 (10.0, 50.0)	17.5 (5.0, 100.0)	0.513