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Higher phosphorus level is associated with intradialytic hypotension in hemodialysis patients

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Objectives:

Intradialytic hypotension (IDH) is a common and serious complication among hemodialysis (HD) patients. Hyperphosphatemia is also common in HD patients and promotes vascular calcification and arterial stiffness which are a risk factor for IDH. We sought to investigate the association between IDH and serum phosphorus level in HD patients.

Methods:

We included 156 adult patients (≥ 18 years of age) who received maintenance HD for at least 3 months or more. IDH was defined as a nadir systolic blood pressure (SBP) <90 mmHg or the occurrence of hypotension-related symptoms requiring intervention such as bolus fluid administration or stop of fluid removal at least once during three consecutive HD treatments. Patients were divided into two groups according to baseline serum phosphorus levels (<5.0 mg/dL or ≥ 5.0 mg/dL).

Results:

Among 156 HD patients, IDH occurred in 47 (30%). Mean \pm SD phosphorus level was 5.0 ± 1.6 mg/dL. In a fully adjusted logistic regression analysis, each increase of 1 mg/dL in serum phosphorus level was associated with 3.7 times greater odds of IDH: the fully adjusted odds ratio (OR) and 95% confidence intervals (CIs) were 3.7 (2.3–6.0). This association was robust even after adjusting for ultrafiltration rate: OR and 95% CIs were 3.7 (2.3–6.1). Categorized phosphorus levels were also associated with IDH. Phosphorus level ≥ 5.0 mg/dL was associated with increased odds for IDH compared to the phosphorus level <5.0 mg/dL: the fully adjusted odds ratio (OR) and 95% confidence intervals (CIs) were 10.5 (3.9–28.2). In subgroup analyses, sex and diabetes mellitus modified the association between IDH and phosphorus level: the association was more pronounced among men and patients with diabetes.

Conclusions:

Among HD patients, higher phosphorus levels were associated with the occurrence of IDH. Therefore, the strict control of phosphorus level may be helpful for the patients who frequently experienced IDH.