Success of Educational Interventions in the Management of CKD-MBD

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Purpose

Chronic kidney disease (CKD) is associated with numerous adverse outcomes, among them bone disorders, fractures, and cardiovascular disease. Mineral and bone disorders (MBD) in patients with CKD are frequently underrecognized and inadequately treated.1,2 A study was conducted to determine if on-line educational interventions could improve competence and performance of nephrologists and cardiologists with respect to CKD-MBD management.

Methods

A cohort of practising nephrologists and cardiologists in the United States who participated in 1 to 3 educational interventions designed to address gaps in the care of patients with CKD-MBD were assessed.1,3

The outcomes survey method to measure competence and performance included knowledge- and case-based multiple-choice questions derived from current clinical recommendations. The domains assessed included identifying and assessing abnormalities in calcium, phosphorus, PTH, and vitamin D levels; individualizing a treatment plan and identifying cardiovascular risk factors.

The survey was fielded to participants at the completion of each educational intervention. Results were then compared with responses from demographically similar control groups in order to determine the impact of the education.

Confidentiality of survey respondents was maintained and responses were de-identified and aggregated prior to analysis.

Non-practicing clinicians and clinicians not involved in the care of patients with CKD-MBD were excluded from the study.

Chi-square tests were conducted to detect differences between the responses of the participant and nonparticipant groups.

Results

For each educational intervention, 200 nephrologists and cardiologists were assessed, divided equally between participants in the education and a matched control group of nonparticipants. Significant improvements were found as a result of participation in the educational interventions with a medium effect size of 0.47 to 0.51 across the 3 activities. Specifically, participants in the education were more likely than nonparticipants to determine:

- A greater calcium intake than output in a patient with CKD, resulting in a positive calcium balance (Figure 1)
- The role of the vitamin D-independent pathway for calcium absorption (nephrologists 56% vs 32%, P=.02; cardiologists 38% vs 18%, P=.04)
- A patient with CKD who needed to reduce phosphorus intake without changing protein intake to lower risk for development of vascular calcification (Figure 2)
- Influence of diurnal fluctuation in serum phosphorus levels and dietary protein intake on a patient’s serum phosphorus measurements (Figure 3)
- Increased risk of cardiovascular calcification with calcium-containing phosphorus binders (cardiologists 52% vs 33%, P=.05)
- Significant dietary protein restriction can lead to an increased mortality risk (cardiologists 54% vs 12%, P=.001)

This study demonstrated the success of targeted, online educational interventions designed to address specific identified practice gaps on improving the practice patterns of nephrologists and cardiologists in the assessment and management of patients with CKD-MBD. Statistically significant improvements in several domains of CKD-MBD management may result in improvements in patient care and outcomes.

Conclusions

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