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Synopsis from the article: [Block GA, Hubert-Sheraton TE, Levin NW, Port FK. Association of Serum Phosphorus and Calcium x Phosphate Product with Mortality Risk in Chronic Hemodialysis Patient: A National Study. American Journal of Kidney Diseases 1998;31\(4\):607-17.](#)

Increase in serum phosphorus concentration is associated with adverse effects on outcomes of patient on dialysis, usually in conjunction with a raised calcium phosphate product value. Loss of kidney function is the major reason for hyperphosphatemia but the level is influenced by dietary phosphate content, use and effectiveness of phosphate binders, and clearance of phosphate by hemodialysis or peritoneal dialysis. In this study, the distribution of serum phosphorus was examined from data collected from two special studies of the USRDS. Since many factors affect outcomes in dialysis patients including, age, sex, smoking use, presence of diabetes, AIDS, or cancer, these results were statistically adjusted in patients who had been dialyzed for at least one year. Thirty percent had serum phosphorus levels above 7 mg/dL and 10% above 9 mg/dL. Concentrations above 6.5 mg/dL were associated with increased risk of death (1.27 greater) and this risk rose rapidly with higher concentrations. Patients found to have higher serum phosphorus levels included younger people at the onset of ESRD, females, whites, diabetics, smokers, and those with higher serum creatinine values. Other studies have demonstrated that a Ca x P product of $>72 \text{ mg}^2/\text{dL}^2$ had a relative mortality of 1.34 compared to that of 42-52 mg^2/dL^2 .

Increased mortality associated with raised phosphorus or Ca x P product value was independent of parathyroid hormone levels. The article concludes with a strong recommendation for control of hyperphosphatemia.

Commentary by Todd S. Ing, MD

Block and colleagues demonstrated definitively that elevated phosphorus and calcium x phosphate product levels in the serum in ESRD patients were associated with a higher mortality rate. The importance of maintaining these serum levels within the normal limits cannot be over-emphasized!