

Endothelial function Assessment according to Serum Phosphorus Level in Chronic Kidney Disease

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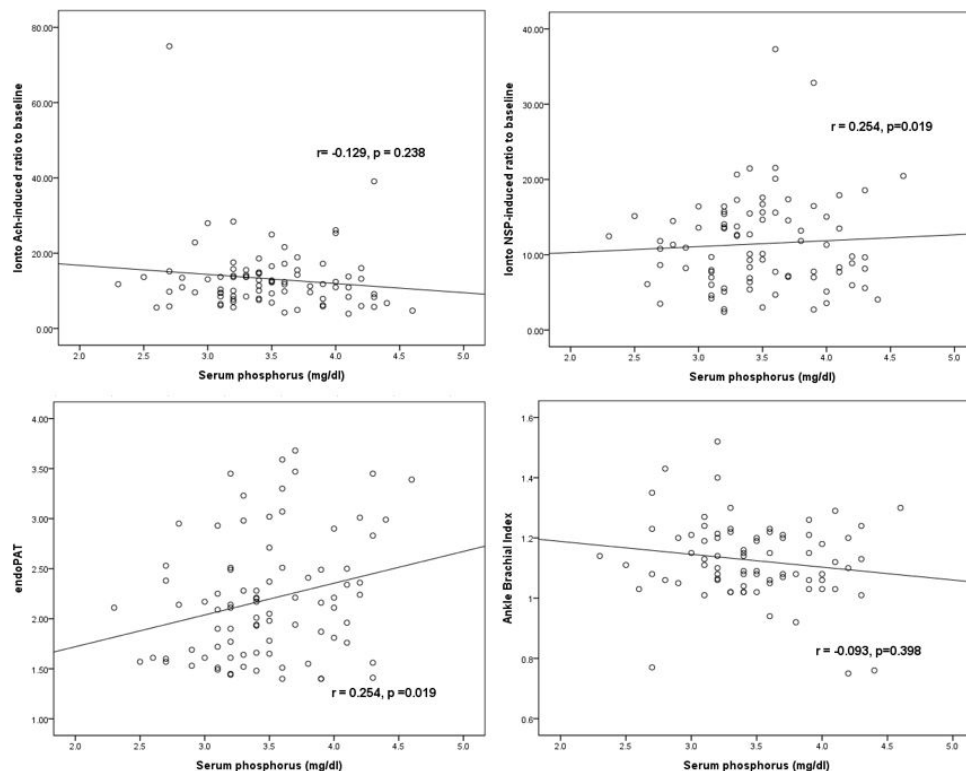
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Background/Aims: Hyperphosphatemia is a important problem because of its affect on endothelial dysfunction as well as homeostasis of bone. Chronic kidney disease(CKD) patients tend to have higher serum phosphorus values than those in healthy population due to their positive balance of phosphorus in kidney. There are a few studies which reported that serum phosphorus level was correlated with endothelial function. Recently it has been reported the patients with higher serum phosphorus level related to the worse endothelial function in healthy population. Thus, the following study was carried out in an effort to identify the relationship between serum phosphorus level and endothelial dysfunction on chronic kidney disease.

Methods: This is a cross-sectional study and the enrolled 85 CKD patients with exception of CKD stage 5 or receiving renal replacement therapy. They were subjected to the measurement with laser doppler flowmetry with iontophoresis, reactive hyperemia peripheral arterial tonometry (RH-PAT) and ankle brachial index, which represented endothelial function assessment. The average serum phosphorus level in patients was measured for the last three months including examination month. The Pearson's correlation coefficient analysis and multiple regression analysis were performed to define the association of serum phosphorus and endothelial function.

Results: When participants were divided into four groups according to estimated GFR, serum phosphorus level had significant higher values in CKD stage 4. From univariate analysis, phosphorus level was not associated with iontophoresis with laser doppler flowmetry and ankle brachial index. Multivariate analysis showed serum parathyroid hormone was independent predictor for endothelial dysfunction assessed with RH-PAT.

Conclusions: The results suggest that potent and comprehensive factors including chronic kidney disease per se induce endothelial dysfunction rather than single values of phosphorus or PTH in patients with CKD. Future studies will be required to ascertain the role of phosphorus on endothelial function in CKD.



The correlation between serum phosphorus and acetylcholine induced iontophoresis(A), sodium- nitroprusside induced iontophoresis(B), reactive hyperemia peripheral arterial tonometry (EndoPAT)(C), and ankle-brachial index(D)