

## 투석환자에서 말초혈관석회화와 폐동맥고혈압 및 심혈관질환 발생의 상관관계

고려대학교 안암병원 신장내과

김선철, 장효정, 김명규, 조상경, 조원용, 김형규

### The Relation between Pulmonary Hypertension, Peripheral Vascular Calcification, and Major Cardiovascular Events in ESRD Patients Undergoing Dialysis

Sun Chul Kim, Hyo Jung Jang, Myung-Gyu Kim, Sang-Kyung Jo, Won-Yong Cho, Hyoung-Kyu Kim

Korea University Medical Center, Department of Internal Medicine, Division of Nephrology

**Introduction:** Pulmonary hypertension (PHT) is a recently recognized complication of chronic kidney disease and end-stage renal disease (ESRD). Although extraosseous calcification might be a risk factor of PHT, previous studies demonstrated conflicting results about the association between PHT and pulmonary artery calcification or parathyroid hormone levels in ESRD patients. In this study we investigated the association between pulmonary hypertension, peripheral vascular calcifications (VCs), and major cardiovascular events.

**Method:** In this retrospective study, we included 172 ESRD patients undergoing dialysis (HD=84, PD=88) who had enrolled previous cross-sectional study in March 2009. The electronic medical records from March 2009 to December 2013 of enrolled patients were reviewed. PHT was defined as an estimated pulmonary artery systolic pressure of more than 35 mmHg using echocardiography. Simple vascular calcification score (SVCS) was measured using plain radiographic films of both hand and the pelvis.

**Result:** The prevalence of PHT was significantly higher in HD patients (57.1% vs. 25.0%,  $p<0.001$ ). ESRD patients with PHT had significantly higher prevalence severe vascular calcifications ( $SVCS\geq 3$ ), and mitral valve disease. They were older, had higher serum calcium levels, left ventricular (LV) mass index, and lower LV fractional shortening. In multivariate analysis, the presence of severe VCs (OR, 2.42,  $p=0.02$ ) and mitral valve disease (OR, 7.11,  $p<0.001$ ), undergoing hemodialysis (OR, 3.72,  $p<0.001$ ), and higher LV mass index (OR, 1.01,  $p=0.04$ ) were independent risk factors for PHT. The patients with PHT had a significantly shorter event-free survival of major cardiovascular events (Log Rank test,  $p<0.01$ ). In a multivariable Cox regression model, higher BMI (HR, 1.16,  $p=0.04$ ), and the presence of severe VCs (HR, 3.96,  $p=0.01$ ), PHT (HR, 6.57,  $p<0.01$ ), and regional wall motion abnormalities (HR, 9.34,  $p=0.01$ ) were significant predictors for major cardiovascular events.

**Conclusion:** The prevalence of PHT was higher in HD patients and is associated with higher major cardiovascular events. The presence of severe vascular calcifications is thought to be independent risk factor for predicting PHT in ESRD patients. Therefore, in ESRD patients with PHT, careful attention should be paid to the presence of vascular calcifications and the occurrence of major cardiovascular events.

**Key Words:** 폐동맥고혈압, 심혈관계질환, 투석

Pulmonary hypertension, Cardiovascular disease, Dialysis