

KSN 2016 Abstract Submission

Dialysis

KSN2016ABS-1353

The ASSOCIATION BETWEEN EPICARDIAL ADIPOSE TISSUE THICKNESS AND ABDOMINAL AORTIC CALCIFICATION IN LATERAL LUMBAR RADIOGRAPHY AS A PREDICTOR OF CORONARY ATHEROSCLEROSIS

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Background: Evaluation of vascular calcification in dialysis patients is important for cardiovascular and all-cause mortality. For dialysis patients, abdominal aortic calcification (AAC) measurement with simple lateral lumbar radiography has been recommended for evaluation of vascular calcification. On general population, there are some studies that epicardial adipose tissue (EAT) thickness could predict coronary atherosclerosis and stenosis. Excessive perivascular adipose tissue (PAT) may induce direct inflammation on vessels and results in atherosclerosis. EAT is the adipose tissue around the heart reaching from the myocardium to the pericardium and apart from coronary PAT. Though, EAT thickness has an association with coronary artery disease. In dialysis patients, EAT thickness is investigated whether has an associations with AAC that can predict vascular stiffness.

Methods: AAC were measured in 27 patients with lateral lumbar radiography. The score was calculated by estimation of aortic calcification from lumbar spine 1 to 4. Echocardiography were performed for EAT thickness measurement. EAT thickness was a highest adipose tissue thickness on the free wall of the right ventricle in parasternal long and short axis view. Other risk factors that would influence on vascular calcification such as serum calcium, phosphate, parathyroid hormone, active vitamin D, and phosphate binding drugs were investigated.

Results: Among 27 patients, male was 74.1 % and mean age was 62.3 ± 8.88 years old. The causes of renal disease were diabetes (63.2%), hypertension (25.9%), polycystic kidney disease (7.4%) and unknown (3.7%). The mean value of AAC and EAT were 3.30 ± 4.72 and 4.35 ± 2.76 mm. The mean value of serum calcium, phosphate, parathyroid hormone and active vitamin D were 8.48 ± 1.24 mmol/L, 4.08 ± 1.65 mmol/L, 455.0 ± 371.7 pg/ml and 29.2 ± 9.48 ng/ml. All of patients have taken phosphate binding drugs. EAT has a correlation with AAC significantly in univariate analysis (Pearson correlation coefficient, 0.362; $p = 0.035$). In multivariate analysis, EAT thickness was correlated with AAC independently (Pearson correlation coefficient, 0.370; $p = 0.034$).

Conclusion: The association between EAT thickness and AAC in hemodialysis patients may reflect more extent vascular calcification not limited to coronary arteries. It could be suspected that patient with increased EAT thickness would has broad vessel calcification such as abdominal aorta or other vessels. This assumption could be verified with well constructed experimental study or randomized control study.

Keywords: abdominal aortic calcification, coronary atherosclerosis, epicardial adipose tissue, hemodialysis