

THE PROGNOSTIC VALUE OF ABDOMINAL AORTIC CALCIFICATION IN DIALYSIS PATIENTS

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• Background

The mortality rate is extremely high in chronic kidney disease (CKD), primarily due to the high prevalence of cardiovascular disease (CVD) in this patient group. Apart from traditional Framingham risk factors, evidences suggest that nontraditional risk factors and especially vascular calcification play a crucial role on it.

This study evaluated the prognostic value of the aortic abdominal calcification score AAC, in terms of left ventricular (LV) diastolic dysfunction, Cardiovascular mortality, and nonfatal cardiovascular (CV) events in peritoneal dialysis (PD) and hemodialysis patients..

• METHOD:

We performed a cross-sectional study in 85 stable prevalent hemodialysis patients and 41 PD patients being in RRT for more than 3months with a mean follow up 25 months.

The aortic abdominal calcification score was estimated by Plain X-ray images of lateral lumbar spine to obtain images of the lower abdominal aorta using semiquantitative scores as described by Kauppila et al. Each segment was assigned a score for anterior wall calcifications and a score for posterior wall calcifications. Scores ranged between 0 and 3(0=no calcification, 1=irregular punctate calcifications, 2=localized linear calcifications, 3=linear calcifications spanning the length of the vertebra). The total score of a patient was calculated as the addition of the partial scores and ranged from 0 to 24 with higher scores indicating a greater degree of calcification of the abdominal aorta. Then patients were divided in two groups based in AAC score; Group 1 with AAC score between 1 and 6, and Group 2 with patients with AAC score 7-24.

• RESULTS:

Seventy-nine patients (62.6%) were identified with aortic abdominal calcification, and the mean AAC score was 4.49 ± 4.03 . Mean score for HD patients were 4.92 ± 4.06 vs 3.41 ± 3.79 in peritoneal dialysis ones ($p=0058$). Calcium level $>9.5\text{mg/dl}$ in hemodialysis patients 1.83 ($1.02-34.09$) $p=0.041$ and Phosphate levels $>5.5\text{mg/dl}$ in peritoneal dialysis patients 4.27 ($1.09-16.6$), $p=0.036$ were found independent risk factors for AAC.

During follow-up (median, 25.2 months), cardiovascular mortality was found 15.5% and 19% of the patients developed nonfatal cardiovascular (CV) events. The 2-year event-free survival rates for mortality and nonfatal CV events were significantly lower in the high AAC score group compared with those in the group with lower score (56.7% vs. 82.1%, $P = 0.02$). The high AAC score was positively correlated with the ratio of peak early transmitral flow velocity to peak early diastolic mitral annular velocity ($E/E' >14$; a marker of left ventricular diastolic function). Using multivariate analyses, the high AAC score group (vs. low score group, HR 2.25, 95% CI(1.77-15.58), $p = 0.01$) and increased E/E' ratio (HR 1.02, 95% CI(1.03-1.21), $p = 0.043$) were independent predictors for CV mortality.

• CONCLUSION:

The AAC was significantly associated with left ventricular diastolic dysfunction and predicted CV mortality in hemodialysis and peritoneal dialysis patients. The development of calcification in dialysis patients is strongly linked to dysregulated mineral metabolism so treating patients based in target recommended may significantly improve their survival.