CARDIAC VALVE CALCIFICATION IS RELATED TO ARTERIAL STIFFNESS MISMATCH IN PREDIALYSIS CHRONIC KIDNEY DISEASE

Y. Kotovskaya, M. Efremovtseva, E.Starostina, Z.Kobalava
Peoples' Friendship University of Russia, Moscow, Russia
Moscow-Russia

Background and Objective

- Chronic kidney disease (CKD) is associated with the presence and progression of vascular and cardiac valve calcification.
- Vascular calcification may promote the reversal of arterial stiffness mismatch and thus development and progression of heart failure with preserved ejection fraction.
- The aim of the study was to evaluate the relationship between cardiac valve calcification and aortic-brachial arterial stiffness mismatch in pre-dialysis hypertensive CKD patients

1. Nicola Gaibazzi et al. Cardiovascular Ultrasound 2014, 12:43:
2.Luca Di Lullo et al Jnephrol 2013; 26(4):739- 744

Material and Methods

Inclusion criteria

✓ Patients with treated arterial hypertension
✓ Known CKD IIIa - IV stages (n=112)

Methods

- Central pulse wave analysis (PWA) and pulse wave velocity (PWV) measurement was done by SphygmoCor (AtCor Medical, Australia)
- PWV was measured at two levels
  - carotid-femoral PWV (aortic PWV)
  - carotid-radial PWV (peripheral PWV)
- Stiffness mismatch between aorta and peripheral arteries was evaluated as PWV ratio
  - PWV ratio = carotid–femoral PWV/carotid-radial PWV
- Echocardiography
  - Cardiac function and presence of cardiac valve calcification were assessed by trans-thoracic echocardiography in all patients.
- Mitral valve calcification was graded (from 0 to 4) according to the Wilkins score index.
  - Grade 1 and 2 calcifications indicate single or scattered areas of increased echo brightness located at leaflet margins, respectively;
  - Grade 3 indicates brightness extending into the mid-portion of the leaflets.
- Aortic valve calcification scoring:
  - score 1 = partial calcification on single cusp;
  - score 2 = partial calcification on 2 cusps;
  - score 3 = extended calcification on 2 cusps;
  - score 4 = extended calcification on all 3 cusps.

Statistic analysis

- $p<0,05$ was considered significant for between group difference

Study Population

Parameters	CKD IIIa (n=54)	CKD IIIb (n=35)	CKD IV (n=23)
Male, n (%)	46,3	45,7	43,4
Age, years	59,5±8,4	60,2±7,8	57,3±10,2
Smoking,n (%)	12 (22,2)	8 (22,9)	6 (26,0)
Diabetes mellitus, n (%)	10 (18,5)	7 (20,0)	6 (26,1)
Brachial BP, mm Hg	149,6±10,3/85,8±9,8	152,5±12,5/86,4±10,2	156,1±14,3/92,8±12,4
Brachial PP, mm Hg	64,2 ±5,7	65,6 ±6,2	65,7 ±6,8
Aorta PP, mm Hg	52,8 ±4,7	54,3 ±6,1	55,6 ±6,2
Aorta BP, mm Hg	138,1±9,4	141,0±10,3	144,7±11,0
Amplification of PP,%	124,1±10,2	119,2±11,4	112,2±10,7*

Results

1. In CKD IIIa, IIIb and IV mitral valve calcification score of grade 1 was observed in 41% 28% and 22%, respectively, of grade 2 - in 50%, 60% and 65%, respectively, of grade 3 - 0, 6% and 13%, respectively.
2. Aortic valve calcification score 1 was found in 6%, 3% and 0, respectively, score 2 - 44%, 31% and 9, respectively, score 3 - in 50%, 60% and 65%, respectively, score 4 - 0, 6% and 26%, respectively.
3. Average cardiac valve calcification score in CKD IIIa was 2,6±0,2, in CKD IIIb 2,8±0,3,in CKD IV - 3,6±0,2 ($p<0,05$ vs CKD IIIa). PWV ratio In CKD IIIa was 0,82±0,25, CKD IIIb - 0,90±0,27, in CKD IV 1,09±0,33 ($p<0,05$ vs CKD IIIa).
4. For the whole study population (n=112) multivariate analysis revealed independent significant correlation between cardiac valve calcification score and PWV ratio β=0,38 ($p<0,05$).

Distribution of patients with CKD III-IV based on heart valves calcification score

Figure 1. Mitral Valve

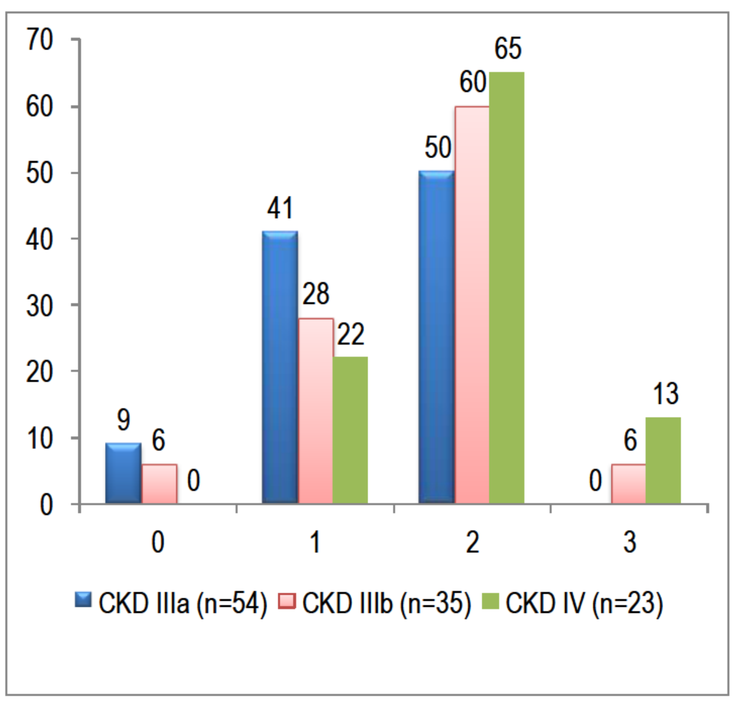


Figure 2. Aortic Valve

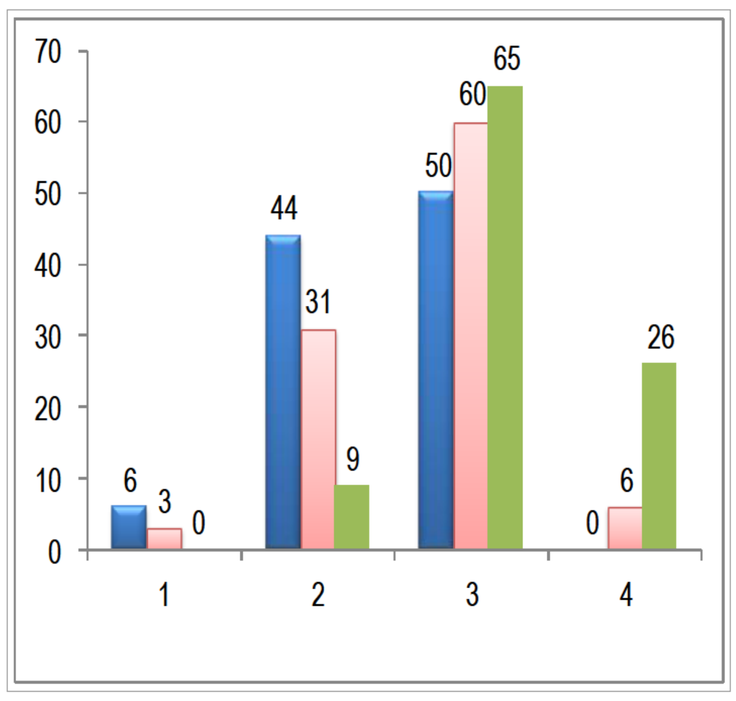
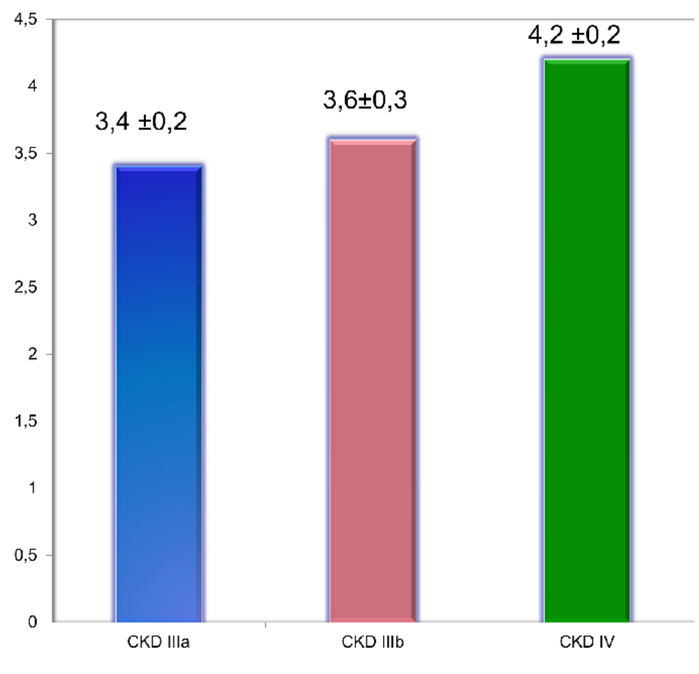


Figure 3.Average total score of valvular calcinosis



p<0,05 if compared to CKD IIIa vs CKD IIV

Conclusions

Mitral and aortic valve calcification is prevalent in pre-dialysis CKD

In the pre-dialysis hypertensive CKD patients cardiac valve calcification score associated with loss of arterial stiffness mismatch

Disclosure: None

52 ERA 93--FP
F2) Hypertension. Clinical.
Yulia Kotovskaya
DOI: 10.3252/pso.eu.52era.2015
ePosters supported by F. Hoffmann- La Roche Ltd.
52 ERA EDTA CONGRESS London 2015 UNITED KINGDOM MAY 28 - 31
PosterSessionOnline.com