

BLOOD PRESSURE AND CARDIAC VALVE CALCIFICATION IN PATIENTS WITH CHRONIC KIDNEY DISEASE

Oleksandr Susla¹, Anatoliy Gozhenko², Ihor Mysula¹

¹ I.Ya. Horbachevsky Ternopil State Medical University, Ternopil, UKRAINE

² Ukrainian Scientific Research Institute of Transport Medicine, Odesa, UKRAINE

OBJECTIVES

The data regarding the role of hypertension (HTN) in mechanisms of cardiac valve calcification (CVC) in chronic kidney disease (CKD) are contradictory and ambiguous, and the information of the relation of CVC with pulse pressure (PP) as an independent predictor of cardiovascular mortality is insufficient. Dynamics of blood pressure (BP) parameters depending on the pre-dialysis and dialysis period of CKD in patients with valve calcification also remain undetermined.

METHODS

We have studied 167 pre-dialysis CKD patients (male, 78; age, 48.7±13.2 years; eGFR-MDRD, 51.0±28.2 ml/min per 1.73 m²) and 94 end-stage renal disease (ESRD) patients (male, 52; age, 46.4±11.2 years; hemodialysis (HD) duration, 28.9±32.4 month). At the pre-dialysis period there predominated patients with pyelonephritis (40.1 %), at the dialysis stage – with glomerulonephritis (47.9 %). Presence and degree (for the mitral and aortic valve, 0-4 points) of CVC were detected by ultrasound. BP was measured after 10 min of recumbency using a manual sphygmomanometer (Korotkov's method). The mean of three consecutive readings, taken 2 min apart, was recorded. Systolic (SBP), diastolic BP (DBP) and PP were evaluated. HTN duration was also recorded. Data are presented as means±SD. Mann-Whitney U-test was used for comparison of the quantitative variables, χ^2 -test for – qualitative ones.

RESULTS

CVC was detected in 28.7 % and 44.7 % of pre-dialysis and HD patients respectively ($\chi^2=6.76$, $p=0.009$). Patients with valve calcification at the pre-dialysis period as well as the dialysis stage of CKD had higher SBP ($p<0.001$, $p=0.006$) and PP ($p<0.001$, $p<0.001$) values compared to subjects without CVC. The DBP means in researched groups of pre-dialysis patients were similar ($p=0.544$), while the indicated parameter in HD patients with CVC was lower ($p=0.070$) (table 1 and 2). For the first time it has been established that the ESRD subjects with valve calcification had higher PP values (73.5±18.9 vs. 63.3±17.5 mmHg, $Z=2.62$, $p=0.009$) and longer HTN duration (131.4±87.8 vs. 99.3±81.8 months, $Z=1.98$, $p=0.048$) than the pre-dialysis patients with CVC; at the same time the SBP ($p=0.220$) and DBP ($p=0.494$) parameters weren't different. CVC group ($n=48$) at the pre-dialysis period of CKD characterized by a lower degree of calcification (4.06±0.88 vs. 4.81±1.19 points, $\chi^2=11.85$, $p=0.019$) compared with those ($n=42$) at the dialysis stage.

Table 1. Indices of BP in pre-dialysis CKD patients according to presence/absence of CVC

Index	Absence of CVC (n=119)	Presence of CVC (n=48)	Z	p
SBP, mmHg	143.7±21.7	158.9±24.4	3.72	<0.001
DBP, mmHg	93.8±14.2	95.5±15.8	0.61	0.544
PP, mmHg	50.5±16.1	63.3±17.5	4.49	<0.001
HTN duration, months	61.3±80.4	99.3±81.8	3.69	<0.001

Table 2. Indices of BP in HD patients according to presence/absence of CVC

Index	Absence of CVC (n=52)	Presence of CVC (n=42)	Z	p
SBP, mmHg	152.8±21.6	165.7±20.6	2.76	0.006
DBP, mmHg	95.2±10.8	92.3±9.2	1.81	0.070
PP, mmHg	56.6±17.2	73.5±18.9	4.21	<0.001
HTN duration, months	80.3±69.7	131.4±87.8	3.06	0.002

CONCLUSIONS

(1) CVC in CKD is combined with the HTN, but the PP level and HTN duration predominated in HD patients. (2) These characteristics can be one of the factors that determine the prevalence and severity of valve calcification in CKD patients, and (3) PP estimation permits a better identification of their cardiovascular risk.

