Arterial stiffness in non-dialysis stage 4 chronic kidney disease (NDCKD) patients. One year follow-up

R.G. Kalaitzidis, D. Karasavvidou, K. Pappas, G. Katatsis, A. Tatsioni, K.C. Siamopoulos

Department of Nephrology, University Hospital of Ioannina, Greece

Objectives:

The relationship between renal function and arterial stiffness (AS), a factor of increased risk mortality remains, until now a subject to debate.

AS assessment, it is more commonly expressed with the aortic pulse wave velocity (PWV) and the peripheral pressure wave reflections (AI).

Moreover, factors associated with AS deterioration in NDCKD have not been determined.

Patients and Methods:

We prospectively investigated AS with the use of PWV and AI in 49 NDCKD stage 4 (mean age 64±13 ys) consecutive patients (45,2 % men, 24.3% diabetics) at baseline and after 1 year of follow-up

For each patient, we recorded: gender, age, BMI, peripheral systolic blood pressure (PSBP), peripheral diastolic blood pressure (PDBP), peripheral pulse pressure (PPP), central systolic blood pressure (CSBP), central diastolic blood pressure (CDBP), central pulse pressure (CPP), hematocrit, hemoglobin, CRP, lipids, calcium, phosphorus, parathormone, serum albumin, estimated glomerular filtration rate (eGFR) and 24h urine albumin excretion

All patients were on drug therapy: 57.5% of them were receiving RAS inhibitors, 32.9% statins, 32.9% vitamin D analogs and 79% EPO agents

Table 1. Blood Pressures and Arterial Stiffness Indices measurements at baseline & the end of follow up

	Baseline (mean±SD)	12 months (mean±SD)	P-value
PSBP (mmHg)	147±20	145±28	0.242
PDBP (mmHg)	78±11	77±12	0.081
PPP (mmHg)	70±20	71±27	0.032
CSBP (mmHg)	138±20	132±25	0.05
CDBP (mmHg)	78±10	77±12	0.061
CPP (mmHg)	60±20	59±23	0.006
AI (%)	26±11	29±13	0.05
PWVC-F (m/sec)	8.94±3.1	9.25±3.19	0.05
eGFR (ml/min/1.73m^2)	20.77±2.3	18.5±3.4	0.05

Table 2. Parameters with a negative impact on PWV during the 12 months of follow-up

Sex (male)	$p<0.05$
Age	$p<0.05$
DM	$p<0.05$
Total-cholesterol	$p<0.001$
Smoking	$p<0.05$

Table 3. Parameters with a negative impact on AIx during the 12 months of follow-up

PSBP	$p<0.05$
CSBP	$p<0.05$
PO_4^-	$p<0.05$
Proteinuria levels	$p<0.04$

Results:

- Mean PSBP/DPBP/PPP levels, mean central CSBP/CDBP/CPP levels, mean eGFR at baseline and at the end of the study are shown in the table **(Table 1)**
- Serum calcium (Ca^{++}) and phosphorus (PO_4^{--}) levels remained within the target in 97% -98% of the patients while Parathormone levels increased (176 vs. 204, pg/ml, p=0.08)
- Furthermore, Hb levels were 11.59 and 11.7 g/dl (p=ns) at the onset and latest follow up(FU). During the FU, lipid parameters were also improved significantly (total cholesterol p=0.05, triglycerides p=0.05, HDL-cholesterol p=0.001 and LDL-cholesterol p=0.05)
- Moreover, medial values of proteinuria at baseline and at the end of the study were 1.300 and 775/mg/24h respectively (p=0.01)
- Both AS indices were increased significantly at the end of FU. Factors associated with increased PWV were age, diabetes mellitus, total-cholesterol, (p=0.001) male sex, (p<0.05) and smoking (p<0.05) **(Table 2)**
- Factors associated with increased AI were PSBP (p=0.05), CSBP (p=0.05), serum PO_4^{--} levels (p=0.04) and proteinuria levels (p=0.04) **(Table 3)**

Conclusions:

✓ Although, control of modifiable risk factors generally improved or remained stable, AS increased significantly after 1 year of FU in NDCKD stage 4 patients

References:

1. Boutouyrie P et all. Aortic stiffness is an independent predictor of primary coronary events in hypertensive patients: a longitudinal study. Hypertens 2002, 39(1):10-52

2. Covic A et all Arterial stiffness in renal patients :un update. Am J Kid Dis 2005, (45)

Poster presented at: