



# Pulse wave velocity has different patterns of association with subclinical cardiac damage in hypertensive patients with or without chronic kidney disease.

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## Objective

In essential hypertensive (EH) as well as among hypertensive with chronic kidney disease (CKD) arterial stiffness (AS) is a major determinant of left ventricular mass (LVM) and geometric pattern. Moreover, AS correlates with impaired diastolic function in both populations. Since different ventricular patterns are associated with a variable CV risk profile, we investigated the association between PWV and LV geometric alterations and function among hypertensive subjects with and without CKD.

## Methods

84 patients were evaluated:

- 40 with established CKD stage 2-4 (mean age  $67,55 \pm 7,54$ , mean eGFR  $33 \pm 17,52$  ml/min)
- 44 without evidence of CKD (EH, mean age  $64,1 \pm 9,3$ , mean eGFR  $74 \pm 16,82$ ).

Each patient underwent physical examination, anthropometric, biochemical measurements, office and 24h ambulatory blood pressure (BP) measurement in order to estimate their cardiovascular risk using SCORE chart. Pulse Wave Velocity (PWV) and central BP values were assessed by applanation tonometry. Left ventricular geometry and function was assessed by 2D color Doppler echocardiography.

## Results

General anthropometrics, bio-humoral characteristics (except eGFR) and overall CV risk (CKD-H SCORE  $7 \pm 3,1\%$ , EH SCORE  $6,7 \pm 2,3\%$ ,  $p=ns$ ) were not statistically different in the two groups.

CKD-H showed higher PWV respect to EH ( $12,660 \pm 4,83$  m/s vs.  $10,165 \pm 3,7$ ,  $p < 0,001$ ).

Despite similar blood pressure control CKD-H had higher LVMI ( $105,58 \pm 19,3$  g/mq vs.  $17,77$  g/mq,  $p < 0,05$ ) respect to EH.

Furthermore, CKD-H showed a stronger correlation between indices of arterial stiffness and several parameters of ventricular dysfunction (shown in Table).

	CKD	EH
LVMI and PWV	$r=0,19^{\text{¥}}$	$r=0,06$
RWT and PWV	$r=0,36^{\text{¥}}$	$r=0,2^{\text{¥}}$
LVMI and A1x	$r=0,16^{\text{¥}}$	$r=0,08$
E/A and PWV	$r=0,47^{\text{¥}}$	$r=0,33^{\text{¥}}$
cSBP and LVMI	$r=0,16^{\text{¥}}$	$r=0,49^{\text{¥}}$
cPP and LVMI	$r=0,27^{\text{¥}}$	$r=0,41^{\text{¥}}$

¥  $p < 0,05$ ; LVMI Left Ventricular Mass Index; PWV Pulse Wave Velocity; RWT Relative Wall Thickness; A1x Augmentation Index; cSBP central Systolic BP; c PP central Pulse Pressure.

## Conclusions

Our results suggest that among CKD-H individuals arterial stiffness is associated with worse left ventricular patterns than among patients with EH. Moreover, our results suggest a greater stiffening of LV and vessels in CKD patients, with greater correlation between AS parameters and LVM in this population. Therefore we suggest that AS should be routinely evaluated among CKD-H in order to stratify their CV risk profile.

