

24-hour pulse pressure and nocturnal hypertension correlate with target organ damage in chronic kidney disease patients.

Dominika Klimczak¹, Tomasz Pilecki¹, Dorota Zochowska¹, Agnieszka Wirkowska¹, Marek Kuch², Leszek Paczek¹,

1. Medical University of Warsaw, Department of Immunology, Transplantology and Internal Medicine, Transplantation Institute, Warsaw, POLAND, 2. Medical University of Warsaw, Chair and Department of Cardiology, Hypertension and Internal Medicine, Medical University of Warsaw, Warsaw, POLAND.

Introduction and objectives

Subclinical atherosclerosis is common among patients with chronic kidney disease (CKD). It is frequently attributed to arterial hypertension and calcification. Carotid intima media thickness (cIMT) is a validated parameter of target organ damage in CKD and is a marker of cardiovascular risk. Aim of the study was to evaluate the correlation of ambulatory blood pressure monitoring (ABPM) parameters and cIMT in CKD patients.

Results

- Pts were treated with antihypertensives: beta-blockers (61%), loop diuretics (41% pts), ACE-I (40%), ARBs (19%).
- IMT correlated significantly with both daytime DBP ($r=-0.50$, $p<0.001$) and night-time DBP ($r=-0.42$, $p<0.001$) as well as PP ($r=0.52$, $p<0.001$) in CKD patients. cIMT correlated significantly neither with SBP nor with night-day BP ratio in the univariate analysis.
- cIMT correlated positively with age ($r=0.65$, $p<0.001$), but not with kidney function expressed as GFR or creatinine, lipid parameters (total cholesterol, HDL-C, LDL-C, triglycerides) or treatment with statins.

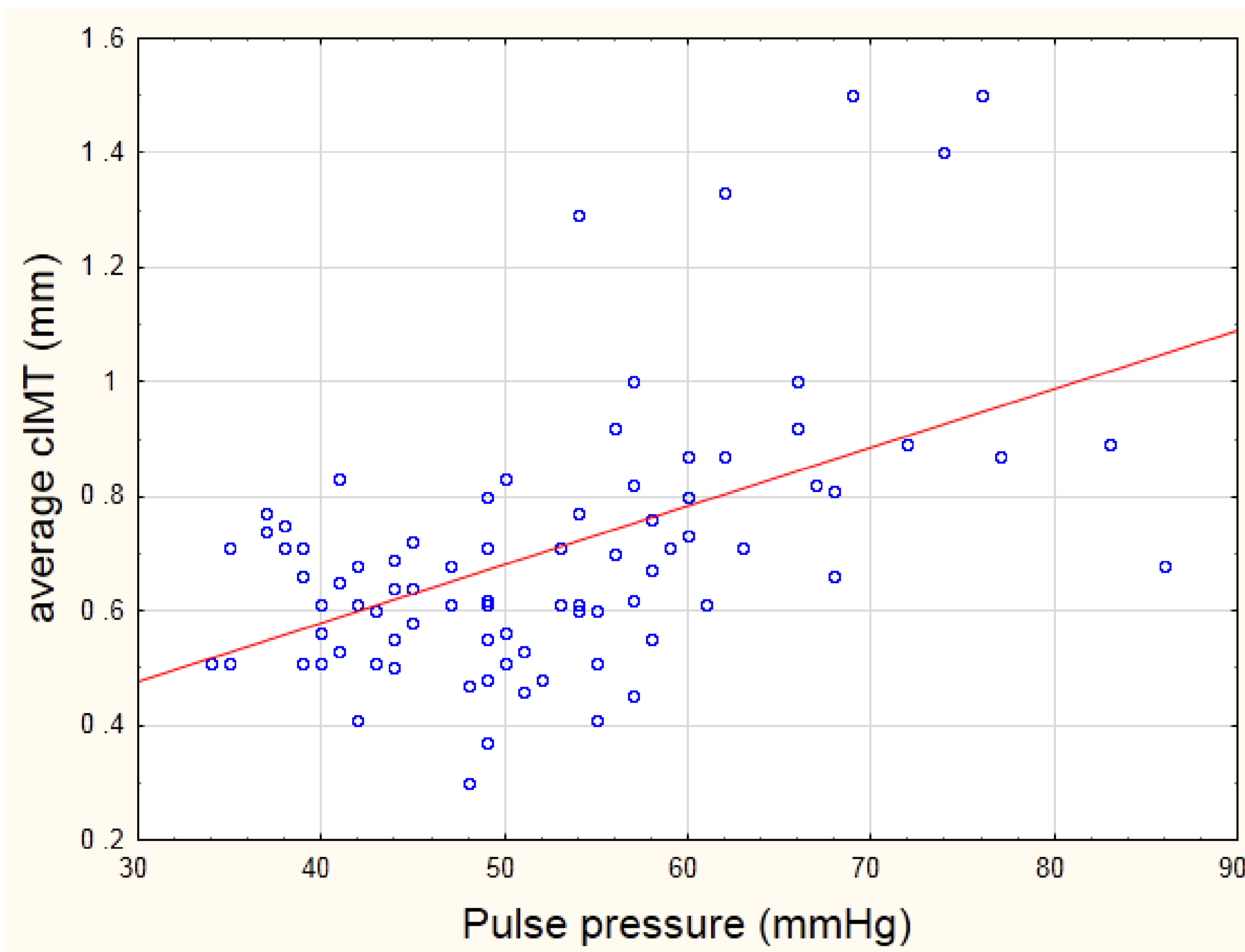


Fig. 1. Association of cIMT with pulse pressure, $p<0.001$.

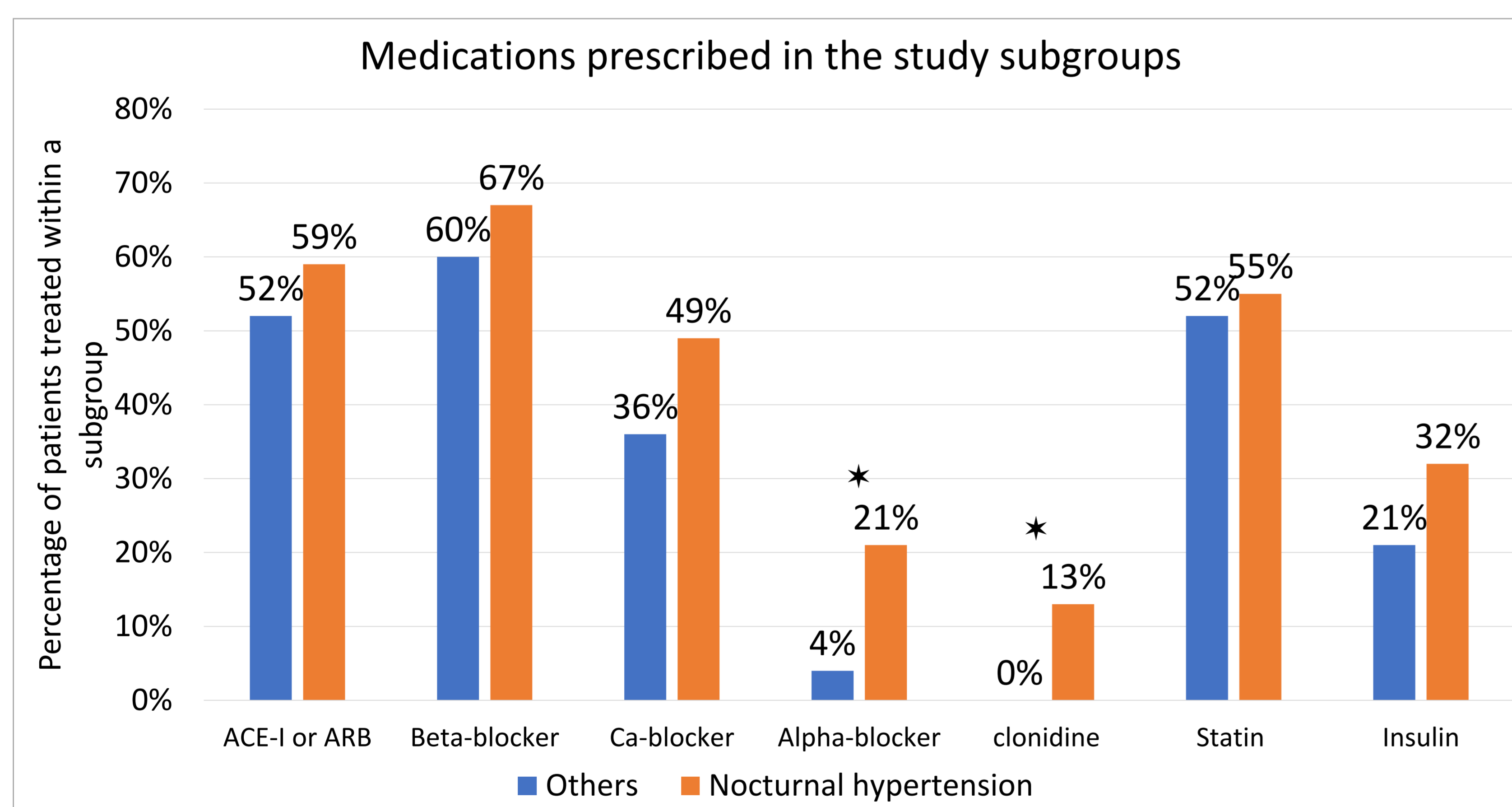


Fig. 2. Medications prescribed in patients with nocturnal hypertension vs. patients with well-controlled BP over night.

Conclusions

Pulse pressure remains underestimated factor associated with target organ damage in CKD patients, besides nocturnal hypertension.

I do not have any potential conflict of interest in regard to the study. Corresponding address: MEDICAL UNIVERSITY OF WARSAW, POLAND, Department of Immunology, Transplant Medicine and Internal Diseases, Nowogrodzka Str. 59 02-006 Warsaw e-mail: leszek.paczek@gmail.com

Methods

- Single centre, cross-sectional study
- 90 CKD pts (stage 2-5) and 25 healthy age-matched control subjects.
- 24-h ambulatory blood pressure monitoring (SpaceLab Medical recorders) and B-mode ultrasound of carotid artery (Toshiba Applio)

	Study group	Control group	P value
Age (yr)	59±14	55±13	0,09
Plasma creatinine (mg/dl)	1.83±1.09	0.83±0.13	<10 ⁻⁶
GFR (ml/min/1,73m ²)	39.0 (9.4-109)	83 (63-106)	<10 ⁻⁶
cIMT (mm)	0.71 ± 0.18	0.63 ± 0.13	p=0.11
LDL (mg/dl)	100 ± 41	114 ± 21	0.03
HDL (mg/dl)	59 (46-78)	63 (51-78)	0.16
TG (mg/dl)	138 (98-183)	93 (66-133)	0.0004
Total cholesterol (mg/dl)	185 ± 43	199 ± 21	0.03
CRP (mg/dl)	1.4 (0.7-3.2)	1.06 (0.56-1.83)	0.02
BMI (kg/m ²)	27 (22.8-31.0)	25.9 (22.9-28.1)	0.42
SBP (mmHg)	126 ± 11	119 ± 9	0.004
DBP (mmHg)	73 ± 8	73 ± 7	0.78
Average day SBP (mmHg)	128 ± 11	123 ± 11	0.02
Average day DBP (mmHg)	76 ± 9	76 ± 8	0.57
Average night SBP (mmHg)	119 ± 16	110 ± 10	0.0006
Average night DBP (mmHg)	66 ± 9	64 ± 7	0.09
Systolic ND ratio	0.93 ± 0.10	0.89 ± 0.07	0.03
Diastolic ND ratio	0.88 ± 0.11	0.84 ± 0.09	0.01

GFR – glomerular filtration rate, LDL – low density lipoproteins, HDL – high-density lipoproteins, TG- triglycerides, CRP – C-reactive protein, BMI – body mass index, SBP – systolic blood pressure, DBP – diastolic blood pressure

Table 1. Clinical characteristics of the study group. Normally distributed data are presented as mean and standard deviation. Non-normally distributed data are presented as median and interquartile range.

	Nocturnal normotension	Nocturnal hypertension	P value
Age (yr)	57±15	62±14	0.10
Plasma creatinine (mg/dl)	1.45 (1.1-1.95)	1.5 (1.1-2.1)	0.004
GFR (ml/min/1,73m ²)	46 (30-60)	39 (23-59)	0.004
LDL (mg/dl)	99±43	97±34	0.85
HDL (mg/dl)	56 (41-68)	61 (47-76)	0.78
TG (mg/dl)	133 (109-177)	129 (80-183)	0.37
Total cholesterol (mg/dl)	183± 43	178±38	0.63
C-reactive protein (mg/dl)	1.3 (0.61-2.3)	1.5 (0.7-4.6)	0.34
Hgb (g/dl)	13.7(13.1-14.6)	13.5 (12.3-14.5)	0.40
White blood cells (G/l)	7.68 (5.61-8.89)	7.19 (6.02 -8.48)	0.27
Neutrophils (G/l)	4.31 (3.30-5.23)	4.38 (3.73-5.95)	0.08
Lymphocytes (G/l)	1.98 (1.64-2.53)	1.73 (1.39 – 2.39)	0.44
Platelets (G/l)	233 (210-265)	205 (185-235)	0.015
Na (mmol/l)	141 (139-143)	141 (140-143)	0.87
BMI (kg/m ²)	25 (22-28)	28 (25-34)	0.031

GFR – glomerular filtration rate, LDL – low density lipoproteins, HDL – high-density lipoproteins, TG- triglycerides, CRP – C-reactive protein, BMI – body mass index, SBP – systolic blood pressure, DBP – diastolic blood pressure

Table 2. Clinical characteristics of patients with nocturnal hypertension and patients with well-controlled BP over night.

In a multivariable linear regression model, after adjustment for age and GFR, among factors that correlated significantly with cIMT were: PP (beta=0.006, p=0.002), age (beta=0.006, p=0.00002) and nocturnal hypertension (beta=0.054, p=0.02).

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Topic: F2 - Hypertension. Clinical