Resistant hypertension subtypes, arterial stiffness and Chronic Kidney Disease

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Background

Resistant hypertension (RH), particularly in the form of isolated systolic hypertension (ISH), is associated with high cardiovascular morbidity and mortality, both in chronic kidney disease (CKD) patients and essential hypertensives (EH). Increased arterial stiffness (AS) is thought to be an important contributor to RH and ISH development.

Aim

Aim of this study is to evaluate the role of increased AS in generating RH subtype in patients with and without established CKD.

Methods

84 patients were evaluated, 40 with established CKD stage 2-4 (mean age 67,55 ± 7,54, mean eGFR 33±17,52 ml/min) and 44 without evidence of CKD (EH, mean age 64,1± 9,3, mean eGFR 74 ± 16,82). Each patient underwent physical examination, anthropometric, biochemical measurements, and office and 24h ambulatory blood pressure (BP). Pulse Wave Velocity (PWV) and central BP values were assessed by applanation tonometry. On the basis of the presence of CKD and ABPM measurements patients were classified into six groups, as shown in Figure 2.

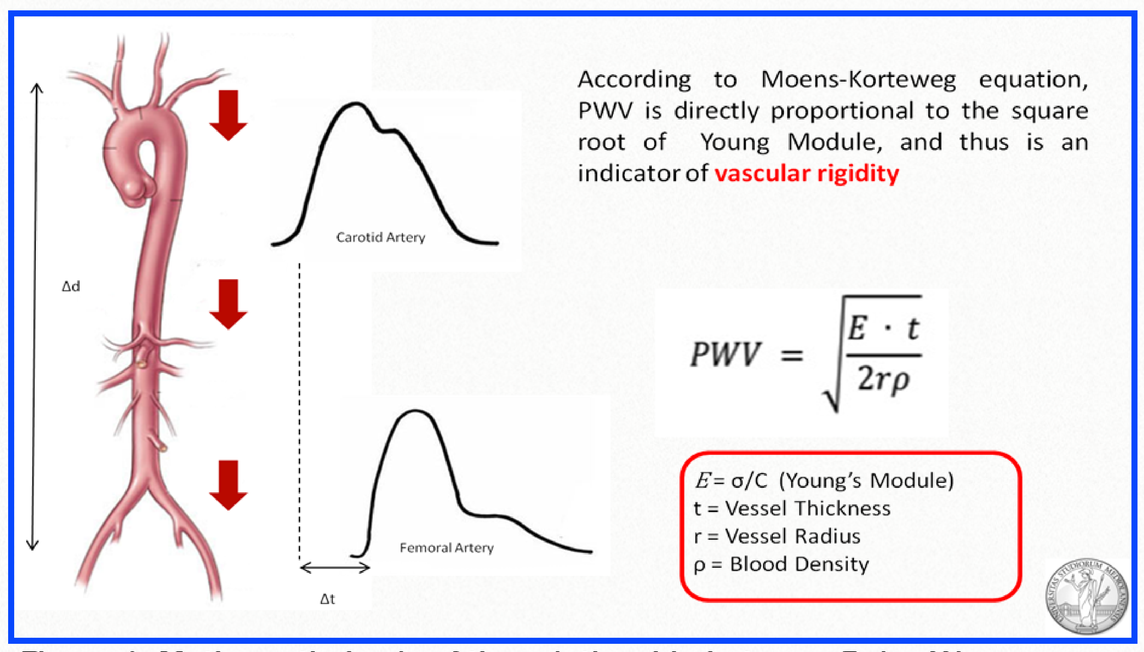

Figure 1. Mathematic basis of the relationship between Pulse Wave Velocity and vascular rigidity.

Results

Clinical, biochemical and tonometric characteristics of different groups are showed in Table 1.
PWV in ISH with CKD group was significantly higher when compared with any other group (p< 0,05). Moreover, both in patients with and without CKD, pooled PWV in ISH and SDH was significantly higher when compared with NT (p<0,05)

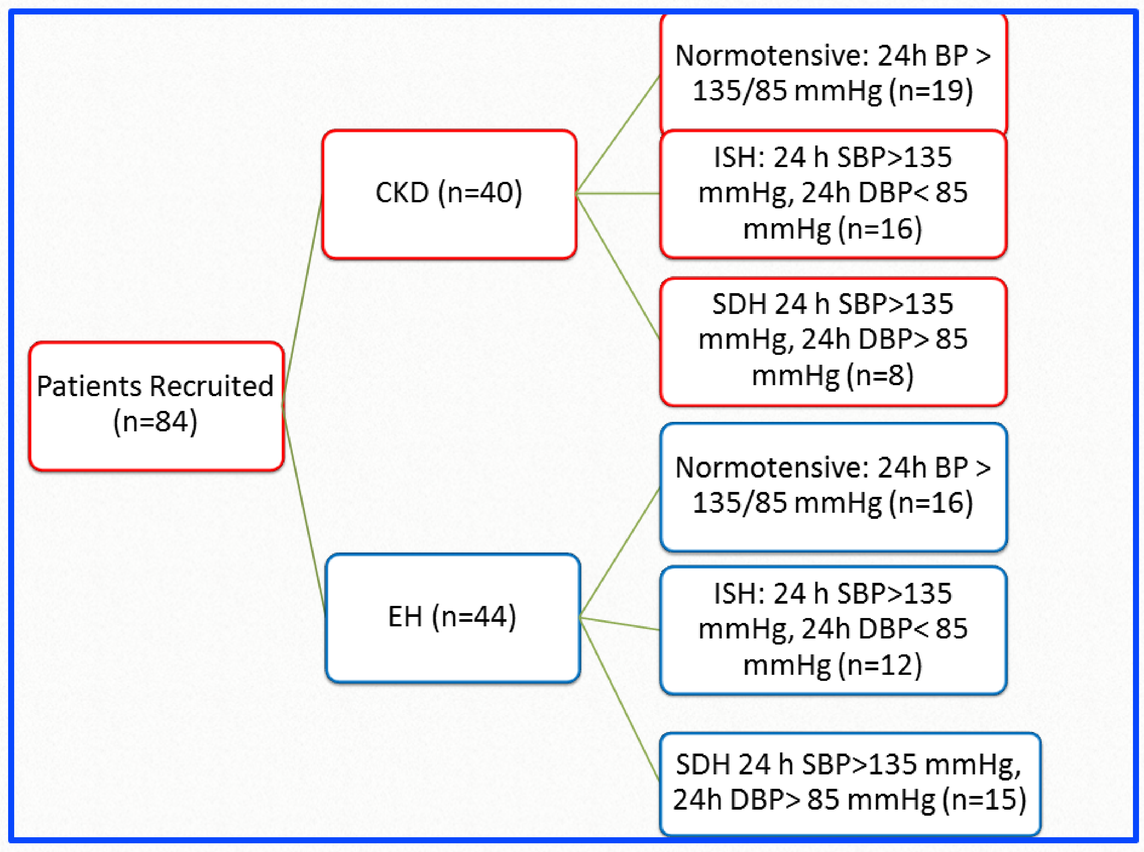

Figure 2. Study Profile. CKD, defined as eGFR<60 ml/min; EH, essential hypertension; ISH, Isolated systolic hypertension; SDH, systo-diastolic hypertension.

Conclusions

This study shows that both in CKD patients and EH, RH is associated with increased arterial stiffness. Furthermore arterial stiffness is higher in CKD patients with ISH when compared with any other group, suggesting a greater influence of AS on RH subtype in this population.

	ISH with CKD	SDH with CKD	NT with CKD	ISH EH	SDH EH	NT EH
Age						
Glucose (mg/dl)	108	104	99	97	92	92
Serum Creatinine(mg/dl)	2.40	2	3	0.85	1.01	0.88
LDL (mg/dl)	98	108	97	135	109	133
HDL (mg/dl)	53	55	54	59	59	59
Triglicerydes (mg/dl)	148	168	113	114	116	124
24h SBP (mmHg)	147	148	126	147	152	115
24h DBP (mmHg)	70	90	72	77	90	76
PWV (m/s)	15.9†¥	11.630†	11.207¥	10.301¥	11.779¥	9.091¥

Table 1.Clinical and biochemical characteristics of the different groups. + p for the difference < 0.01; ¥ p for the difference < 0.05

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