



PATIENTS WITH ADVANCED KIDNEY DISEASE AND NEPHROANGIOSCLEROSIS MIGHT NOT BENEFIT OF STRICT BLOOD PRESSURE CONTROL

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Background

Recommended blood pressure (BP) targets in chronic kidney disease (CKD) may differ in accordance with the etiology of CKD. In particular lower BP target may induce ischemic hypoperfusion and worsening of renal function. In particular in those patients with diffused microvascular renal damage may be that an adequate renal perfusion depend on systemic BP values. In order to explore this hypothesis we investigated if BP targets recommended by 2013 ESH guidelines for CKD patients are equally renoprotective in subjects with nephroangiosclerosis (NAS+) respect to those with other nephropathies (NAS-).

Material and Methods

We analyzed 148 hypertensive patients with CKD (stages 3b-4), NAS+ (n=77) and NAS- (n=71). Nephroangiosclerosis was defined as: duration of hypertension >10 years, absence of diabetes, proteinuria<500 mg/24h and exclusion of the presence of other nephropathies (by imaging, biopsy where necessary and clinical history).

We collected at two visits: anamnesis, BP, blood and 24h urinary samples. BP was measured as the average of three office determinations per visit as well as 24h ambulatory monitoring (ABPM). eGFR was determined by CKD-EPI formula and eGFR decline as: (eGFR2-eGFR1)/months of follow up.

| | NAS+ | NAS- | p |
|--------------------------------|------------|--------------|---------|
| Number | 77 | 71 | |
| Age (years) | 71,9±10,1 | 72,7±8,5 | 0,59 |
| Males/females (%) | 51/26 | 51/20 | 0,46 |
| Diabetes (%) | 0 | 43 | <0,0001 |
| Previous CV events (%) | 13,6 | 18,4 | 0,1 |
| Charlson index | 5,76±1,77 | 6,57±1,96 | 0,01 |
| Duration of follow up (months) | 20,7±10,5 | 18,4±7,3 | 0,14 |
| BMI (Kg/m ²) | 26,94±4,2 | 27,6±4,07 | 0,37 |
| eGFR (ml/min) | 35±11 | 34±11 | 0,59 |
| Proteinuria (g/24h) | 219±146,8 | 954,8±1031,9 | <0,0001 |
| Urinary Na excretion (mEq/24h) | 140±67,7 | 166,5±67,7 | 0,0199 |
| Glicemia (mg/dl) | 100,5±22,5 | 131,5±39,4 | <0,0001 |
| Plasma Na (mEq/L) | 141±2,6 | 141,7±2,3 | 0,73 |
| Plasma K (mEq/L) | 4,6±0,409 | 4,7±0,263 | 0,24 |
| Hemoglobin (g/dl) | 22,8±21,96 | 22,2±21,4 | 0,91 |

Table I: Characteristics of the cohort.: BMI: Body Mass Index; PTH: Parathormone; eGFR: glomerular filtration rate estimated with CKD-EPI formula

Results

NAS+ and NAS- did not differ regarding: age (72 ± 10 vs 73 ± 9 years; p=0,59), eGFR at baseline (35±11 vs 34±11 ml/min; p=0,59), duration of follow up (20±10 vs 18±7 months; p=0,14) and average number of anti-hypertensive drugs (2,5±1,2 vs 2,8±1,3; p=0,199). NAS- had a higher 24h proteinuria at baseline(219±147 vs 955±1032 mg; p<0,0001) and had a higher Charlson index (6,6±2,0 vs 5,8±1,8; p=0,01). NAS+ were more frequently treated with RAS inhibitors (32vs29%; p=0,012) and less frequently treated with diuretics (32vs29%; p=0,09) respect to NAS-.

NAS+ and NAS- office BP was: SBP1 138±19 vs 144±21 mmHg, p=0,59; DBP1 81±11 vs 81±10 mmHg, p=0,56; SBP2 137±17 vs 138±17, p=0,014; DBP2 78±13 vs 78±12, p=0,03; ABPM was: PAS24h 130±14 vs 134±13 mmHg, p=0,7; PAD24h1 72±9 vs 72±7 mmHg, p=0,64; PAS24h2 130±11 vs 133±11 mmHg, p=0,37; PAD24h2 72±9 vs 71±8, p=0,77.

Patients with office BP at target at both visits demonstrated an increase of eGFR in NAS- (0,37±1,15 vs -0,04±0,51 ml/min/month; p=0,03) and a trend towards a decrease of eGFR in NAS+ (-0,02±0,63 vs -0,14±0,28 ml/min/month; p=0,4); independently of: BP and proteinuria variations, age, diabetes, Charlson index and duration of follow up.

| Office | Baseline | | Follow up | | p | p |
|---|----------|----------|-----------|-----------|--------|--------|
| | NAS+ | NAS- | NAS+ | NAS- | | |
| SBP, mmHg | 139±19 | 144±21 | 137±17 | 138±17 | 0,59 | 0,014 |
| PAD, mmHg | 81±11 | 81±10 | 80±13 | 78±12 | 0,56 | 0,03 |
| SBP at target | 33 | 22 | 34 | 28 | 0,0018 | 0,0052 |
| PAD at target | 46 | 46 | 49 | 48 | 0,0019 | 0,0002 |
| Ambulatory Blood Pressure Monitoring | | | | | | |
| 24h SBP, mmHg | 130±14 | 134±13 | 131±11 | 133±11 | 0,91 | 0,37 |
| 24h DBP, mmHg | 72±9 | 72±7 | 72±9 | 71±8 | 0,64 | 0,77 |
| Day SBP, mmHg | 133±14 | 136±13 | 133±11 | 135±10 | 0,91 | 0,23 |
| Day DBP, mmHg | 75±9 | 74±7 | 74±9 | 73±9 | 0,37 | 0,63 |
| Night SBP, mmHg | 125±16 | 129±16 | 124±21 | 129±16 | 0,81 | 0,92 |
| Night DBP, mmHg | 67±9 | 67±9 | 67±11 | 67±9 | 0,54 | 0,99 |
| 24hSBP at target | 44 | 32 | 44 | 31 | 0,0003 | 0,0007 |
| 24hDBP at target | 64 | 62 | 67 | 61 | 0,0027 | 0,453 |
| Drugs | | | | | | |
| Number of antihypertensives | 2,5±1,2 | 2,8±1,3 | 2,6±1,2 | 2,9±1,3 | 0,199 | 0,34 |
| RAAS inhibitors, % | 32 | 29 | 32 | 29 | 0,012 | 0,001 |
| Diuretics, % | 32 | 29 | 32 | 29 | 0,09 | 0,25 |
| Renal function | | | | | | |
| Proteinuria, mg/24 ore | 222±148 | 967±1034 | 378±485 | 916±919 | 0,006 | 0,56 |
| ΔeGFR, ml/min/mese | n.a. | n.a. | 0,12±0,70 | 0,08±0,49 | n.a. | 0,055 |

Table II: Blood pressure control and treatment.: SBP: Office systolic blood pressure, DBP: Office -diastolic blood pressure; SBP-24: 24h systolic blood pressure; DBP-24: 24h diastolic blood pressure; SBP-DAY: diurnal systolic blood pressure; DBP-DAY: diurnal diastolic blood pressure; SBP-NIGHT: nocturnal systolic blood pressure; DBP-NIGHT: nocturnal diastolic blood pressure; PTH: Parathormone eGFR: glomerular filtration rate estimated with CKD-EPI formula

Conclusions

In patients with CKD and nephroangiosclerosis (NAS+), differently from what happens in patients with diabetes or other nephropathies (NAS-), strict BP targets recommended by ESH guidelines are not renoprotective.

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