BLOOD PRESSURE EVALUATION WITH THE USE OF ABPM IN PATIENTS IN THE FIRST YEAR AFTER KIDNEY TRANSPLANTATION

Katarzyna Slubowska[1], Jacek Szmidt[2], Andrzej Chmura[3], Magdalena Durlik[1]

[1]Department of Transplantation Medicine and Nephrology, Institute of Transplantology, Medical University of Warsaw,

[2]Department of General, Vascular and Transplant Surgery, Medical University of Warsaw

[3]Department of General and Transplant Surgery, Institute of Transplantology , Medical University of Warsaw

INTRODUCTION AND AIMS

Arterial hypertension is one of the main cardiovascular risk factors in renal transplant (RTx) recipients. The purpose of the study was to assess the incidence of arterial hypertension with the use of ambulatory blood pressure measurement (ABPM), to investigate the hypertension-related factors and to assess the circadian blood pressure profile.

METHODS

Ambulatory blood pressure measurements (every 15 minutes during the day and every 30 minutes at night) were performed in 82 patients in an early period (M/F: 58.7 / 41.3 %, age: 42.9 ± 14.1 years) and in 70 of them at one year post-RTx. At the same time, basic blood tests, intima-media thickness (IMT) measurements of carotid arteries and echocardiography were performed. In the period before RTx, hypertension was diagnosed in 80,5% of patients, ischemic heart disease in 10,9%, stroke in 1,2%, peripheral vessel diseases in 6%, left ventricular hypertrophy in 61%, smoking in 20,7%. **Hypertension was defined as taking antihypertensive medicines** (including diuretics) **or mean values: for 24 hours ≥ 130/80 mmHg or daily ≥ 135/85 mmHg or nocturnal ≥ 120/70 mmHg.** The above values were considered as thresholds for good blood pressure control. Statistical analyses were performed with the use of the R Package.

RESULTS

One year post-RTx, hypertension was found in nearly 100% of the patients and was well controlled in 46% of them. The patient's age, the donor's age, the body weight, renal function, acute rejection episodes, the duration of dialysis therapy prior to RTx, the history of peripheral vessel diseases prior to RTx and smoking status had a significant correlation with blood pressure values. At one year post-transplantation, 55% of the hypertensive patients were *„non-dippers"*, 30% were *„inverse-dippers"* and only 15% were *„dippers"*. *„Inverse-dipper"* profile was significantly associated with elder age (p=0.014), *„dipper"* was correlated with lower BSA (p=0.03). At one year post-transplantation patients with *„dipper"* profile had significantly greater eGFR (69 [61-83] vs 54 [39-70] ml/min/1,73m^2, p = 0.024). Abnormal circadian blood pressure profile was associated with a greater left ventricular mass (199 [156-235] vs 145 [126-162]g, p = 0.02) and greater IMT (0,62 [0,61-0,69] vs 0,56 [0,52-0,62] mm, p = 0.04). Renal transplant arterial stenosis was observed in 5,7% of patients and had no significant statistical correlation with blood pressure values.

Results from ABPM	Early after RTx		One year after RTx		p
	mean ± SD *Or* median and [1Q-3Q] *Or* number	min.-max *Or* %	mean ± SD *Or* median and [1Q-3Q] *Or* number	min.-max *Or* %	
SBP 24h [mmHg]	130,7 ± 12,5	99-163	126,4 ± 11,1	104-153	0.01
DBP 24h [mmHg]	78 ± 9,2	57-102	74,4 ± 8	58-101	0.006
SBP day [mmHg]	129,6 ± 12,1	99-166	128,1 ± 10,9	108-152	NS
DBP day [mmHg]	77,9 ± 8,9	61-102	76,6 ± 8,2	60-99	NS
SBP night [mmHg]	131,9 ± 15,6	98-178	124,9 ± 15,1	94-158	0.0035
DBP night [mmHg]	77,5 ± 10,9	52-104	71,6 ± 9,5	53-104	0.0007
MAP [mmHg]	95,7 ± 9,3	78-119	92 [86-97]	76-118	0.0017
HR 24h [/min]	76,6 ± 9,6	57-99	71,1 ± 8,3	56-98	0.0001
HR day [/min]	79,7 ± 10,5	59-101	75,3 ± 9,4	59-104	0.0059
HR night [/min]	70,6 ± 9	51-94	63,8 ± 7,3	50-87	< 0.0001
SBP≥ 130 AND/OR DBP≥ 80 mmHg	52	64,2%	36	53,7%	NS
SBP ≥ 130 mmHg	45	55,6%	28	41,8%	NS
DBP ≥ 80 mmHg	43	53,1%	18	26,9%	0.025
dipper	1	1,3%	9	15%	0.03
non-dipper	42	52,5%	33	55%	NS
inverse-dipper	37	46,3%	18	30%	0.09
0 hypotensive medicines	6	7,3%	4	5,7%	NS
≥ 3 hypotensive medicines	28	34,1%	26	37,1%	NS
Number of hypotensive medicines	2	0-6	2	0-6	NS

Other results	Early after RTx		One year after RTx		p
	mean ± SD *Or* median and [1Q-3Q] *Or* number	min.-max *Or* %	mean ± SD *Or* median and [1Q-3Q] *Or* number	min.-max *Or* %	
BMI [kg/m^2]	22,1 ± 3,4	15,5-31,2	23,4 [20,8-26,1]	17,8-34,6	<0.0001
BMI ♂ [kg/m^2]	22,7 ± 3	17,6-29,9	24,3 [22,1-26,3]	18,1-34,6	0.00003
BMI ♀ [kg/m^2]	21,4 ± 3,9	15,5-31,2	22,5 [19,7-24,4]	17,8-33,5	0.0002
Creatinine [mg/dL]	1,4 [1,2-1,9]	0,8-4,9	1,2 [1-1,8]	0,8-3,6	<0.0001
Creatinine ♂ [mg/dL]	1,6 [1,3-2]	0,9-4,9	1,4 [1,2-1,9]	0,8-3,6	0.03
Creatinine ♀ [mg/dL]	1,2 [1,1-1,5]	0,8-3,6	1,1 [0,9-1,2]	0,8-2	0.0002
eGFR [mL/min/1,73m^2]	52,3 ± 20,5	13,1-108,4	59,9 ± 20,7	20-107,5	0.00017
eGFR ♂ [mL/min/1,73m^2]	54,2 ± 22,5	13,1-108,4	60,6 ± 23,5	20-107,5	0.03
eGFR ♀ [mL/min/1,73m^2]	49,7 ± 17,1	15,3-94,5	59 ± 17	30-90,1	0.002
Hemoglobin [g/dL]	10,9 ± 1,5	7,4-15,2	13,6 ± 1,8	9,5-18	<0.0001
Total Cholesterol [mg/dL]	210 [170,2-253,7]	110-477	194,2 ± 43,7	87-310	0.0084
LDL- Cholesterol [mg/dL]	113 [90-142,5]	40-338	109 [83-120]	41-226	NS
HDL- Cholesterol[mg/dL]	47 [37-58]	23-107	57 [48-65]	29-109	< .0001
Triglycerides [mg/dL]	181,5[134-235,5]	62-718	120 [98,2-170,7]	29-297	<0.0001

SBP – systolic blood pressure, DBP – diastolic blood pressure, MAP – mean arterial pressure, HR – heart rate,

BMI – body mass index, BSA – body surface area

CONCLUSIONS:

Hypertension is observed in nearly 100% of patients one year after renal transplantation and is well controlled in 46% of them. Ambulatory blood pressure measurement is indicated in all renal recipients to detect arterial hypertension and circadian blood pressure profile abnormalities and to introduce the optimal treatment.

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Katarzyna Slubowska

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