THE ROLE OF ESTABLISHING RENAL RESISTIVE INDEX IN HYPERTENSIVE NEPHROPATHY

ALINA STANIGUT, LILIANA TUTA

OVIDIUS UNIVERSITY OF CONSTANTZA
NEPHROLOGY DEPARTMENT

INTRODUCTION

High renal resistive index (RRI) may reflect the presence of renal arteriolar lesions and may serve like prognosis marker in hypertensive nephropathy (HTN).

Prospective study rolled out in Nefrology Department and Internal Medicine Department, County Clinical Hospital of Constanţa;

- Period of study: 01.08.2010-01.08.2015;
- We investigated 1591 hypertensive pacients (systolic BP ≥ 140mmHg and/or diastolic BP ≥ 90mmHg), with, at list, 5 years of arterial hypertension history.
- Taking in count the inclusion and exclusion criterias (listed below) we selected 295 pacients (186 male- M, 109 female-F).

MATERIAL AND METHODS

Inclusion criterias:

(Schlessinger criterias for hypertensive nephropathy)
- Familial history of arterial hypertension (AH) in I degree relatives;
- Left ventricular hypertrophy (LVH) diagnosed by echocardiography and/or by electrocardiography;
- proteinuria < 500mg/24 hours;
- AH history wich preceed any sign of a kidney disease (proteinuria or serum creatinine > 1,2 mg/dl).

Exclusion criterias:

congenital /acquired kidney diseases, nephrotoxics exposure, systemic diseases with renal involvement, diabetes mellitus, congestive heart failure III–IV NYHA class, liver diseases, neoplasic diseases, psyhiatric diseases, pregnancy.

Pacients evaluation :
- Anamnesis and complete physical examination;
- Routine seric and urine biochemical analyses (including proteinuria/24 hours / microalbuminuria);
- Electrocardiography and/or echocardiography (for LVH);
- renal standard ultrasonograhy and color Doppler and pulse wave Doppler for renal arteries (LOGIQ 100 and LOGIQ 700 machines);
- RRI was calculated at the level of interlobar and arcuate arteries;
- statistical analysis –Microsoft Excel program.

RESULTS AND DISCUSSION

- High RRI – 192 patients (64%);
  - 67% patients with renal failure at the arcuate and interlobar arteries → stenosis of small arteries;
  - 23,8% patients with normal kidney function.
- The affection of intrarenal arteries was associated with lesions of abdominal aorta:
  - aneurysm (5,69%);
  - atheroma plaques (9,8%);
  - parietal calcifications (4,1%).

Table 1 Parameters of study patients

Parameter	Male	Female	All patients	p
Total cholest.	226,52±36,84	224,11±37,35	225,57±8,37	NS
LDL cholest.	142,24±10,51	138,22±9,2	140,66±10,19	0,0005
HDL cholest.	38,99±6,17	43,17±4,26	40,63±5,86	<0,0001
Triglicerides	208,25±59,12	184,99±54,26	199,12±58,3	0,0003
s. uric acid	7,84±1,87	5,02±1,54	6,6±2,33	<0,0001
s. creatinine	1,3±0,47	0,79±0,41	1,1±0,51	<0,0001
RFG CKD-EPI	78,61±13,75	70,37±14,64	75,87±14,55	<0,0001
Microalbumin.	71,35% 189,44±66,29	59,67% 178,06±73,24	66,77% 185,45±68,85	NS
Proteinuria	28,64% 435,94±69,63	40,32% 432,02±70,56	33,22% 434,07±69,76	NS
IMVS (g/m²)	125,32±2,14	120,76±6,58	123,25±5,22	<0,0001
Renal volume	107,31±9,21	106,83±10,81	107,11±9,89	NS
RRI	0,72±0,07	0,76±0,06	0,74±0,07	<0,0001

Table 2 Univariate correlation between RRI and selected variables

Variabie	r	p
Renal Volume	-0,57	0
LVMI	0,20	<0,0001
Diastolic BP	- 0,18	0
Systolic BP	0,30	<0,001
Microalbuminuria/ proteinuria	0,17	<0,0001
Serum Creatinine	0,17	<0,0001
GFR CKD-EPI	-0,27	<0,0001
Serum uric acid	0,18	<0,001
Serum total Cholesterol	0,41	<0,001
HDL-cholesterol	-0,53	<0,0001
LDL-cholesterol	0,20	0

Image 1 ECHO DUPLEX PULSE WAVE DOPPLER IMAGE WITH AN INTERLOBAR ARTERY
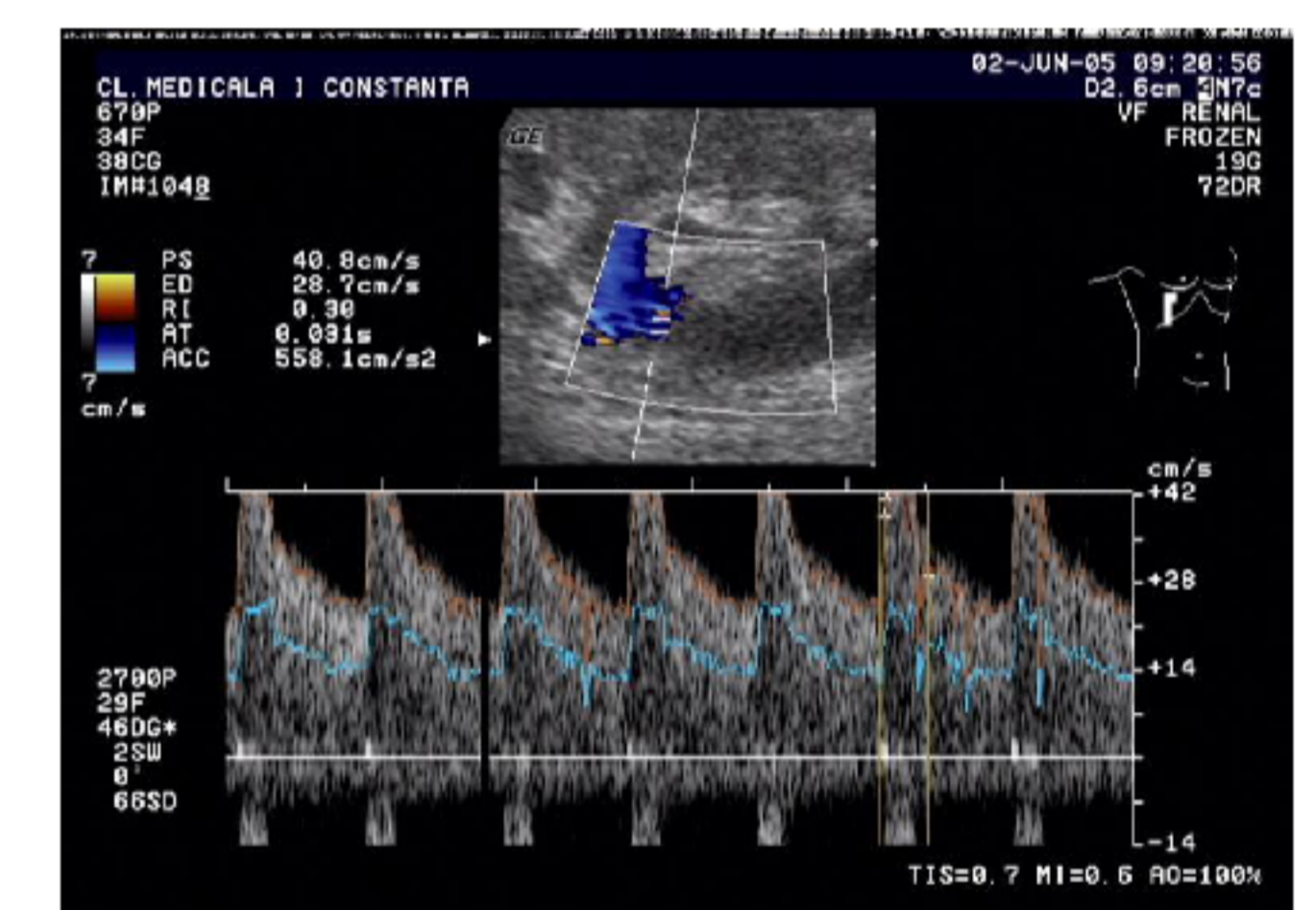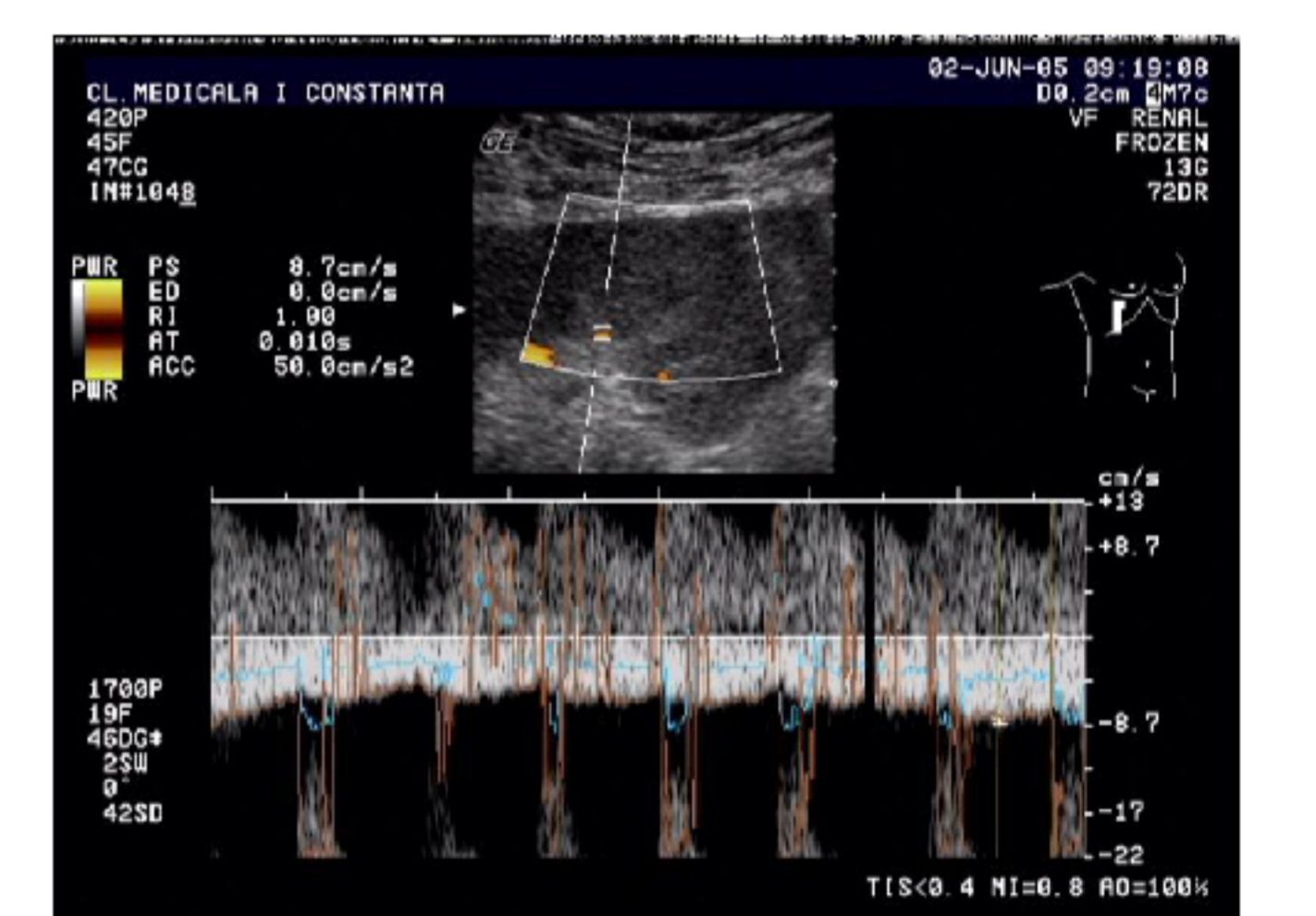

Image 2 ECHO DUPLEX PULSE WAVE DOPPLER IMAGE WITH AN ARCUATE ARTERY

CONCLUSIONS

- High RRI can be considered a marker of renal and systemic vascular affection and may be useful to identify hypertensive patients which need adequate preventive and therapeutical measures .
- The positive correlation between RRI and microalbuminuria/proteinuria and the negative correlation between RRI and kidney volume may reflect the presence of nephroangiosclerosis. High RRI can be a marker of HTN and a predictor of progression of kidney disease in hypertensive patients.

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