

LUPUS NEPHRITIS CLASS IV-G HAS A WORSE RENAL OUTCOME THAN CLASS IV-S: RETROSPECTIVE SINGLE CENTER COHORT

Camila Barbosa L. de Oliveira, Aline S. A. Oliveira, Clarissa Jacob B. Carvalho, Carla Tenório B. C. Pessoa, Luis H.B.C. Sette, Gisele Vajgel Fernandes, Maria Alina G.M. Cavalcante and Lucila Maria Valente.

Background

The International Society of Nephrology/Renal Pathology Society (ISN/RPS) classification of lupus nephritis (LN) divided class IV into segmental (IV-S) and global (IV-G), based on evidence suggesting that diffuse segmental and global lupus nephritis may have different pathogenesis and outcomes.¹ However, although retrospective studies have shown significant clinical and pathological differences between LN IV-G and LN IV-S, no significant differences in outcomes were detected.

Therefore, we investigated the clinical usefulness of the ISN/RPS classification of LN to evaluate clinical and pathological differences, and possible differences in long-term outcomes between diffuse focal and diffuse global lesions.

Methods

Patients

The records of adult patients with biopsy proven LN IV between 2004 and 2012, were retrospectively reviewed. Demographic data, clinical characteristics, biochemical parameters and autoantibody profiles at the time of kidney biopsy and during follow-up were obtained from the patient records. All kidney biopsy were classified using ISN/RSP classification.

Definitions

Creatinine clearance (CrCl) was calculated using the equation of the Modification of Diet in Renal Disease (MDRD) study. The definitions of complete response (CR) and partial remission (PR) were based on kidney disease: improving global outcomes (KDIGO) glomerulonephritis 2012.²

Outcomes

Outcomes were analyzed at the end of follow-up, and defined as: (1) any complete remission; (2) any partial remission; (3) doubling of baseline creatinine; (4) CrCl < 30 ml/min/1.73m²; (5) necessity of renal replacement therapy (RRT). The outcome of doubling serum creatinine was evaluated by the comparison between the lower creatinine before the kidney biopsy and the creatinine at the end of the follow up.

Results

Of the 120 patients assed, 71 (59.1%) had LN IV-G and 49 (40.8%) had LN IV- S. Demographic data, clinical characteristics, biochemical parameter, autoantibody profiles and histopathologic finds are shown in Table 1 and 2. Seventy-two patients were analyzed at the end of evaluation (Table 3).

Conclusions

We found clinical and pathological differences between LN class IV-S and IV-G groups. Patients with biopsy proven LN class IV-G had more rapidly progressive glomerulonephritis clinically, with a worse baseline CrCl, and a higher risk of renal disease progression and renal replacement therapy.

Table 1. Baseline characteristics of patients with lupus nephritis class IV

	IV-S N=49	IV-G N=71	p-value
Mean age, years	30.9 ± 9.8	31.7 ± 9.9	0.450
Gender (female/male), n	45/4	65/6	1.000
Race (non-white/white), %	61/39	60/40	1.000
Symptoms			
Hematuria and/or non-nephrotic proteinuria, %	33.3	10.0	0.002
Nephritic syndrome with nephrotic proteinuria, %	31.2	25.7	0.536
Rapidly progressive glomerulonephritis, %	27.0	55.7	0.002
Nephrotic syndrome, %	10.5	8.5	0.999
Hypertension (BP ≥ 140x90mmHg), %	75.0	83.5	0.332
Time between lupus diagnosis and biopsy, years	4.0 ± 3.0	3.0 ± 4.3	0.123
Serum creatinine, mg/dl	1.7 ± 1.5	2.7 ± 2.1	0.020
CrCl, ml/min/1.73m ² (MDRD)	60.2 ± 28.6	42.6 ± 30.5	0.003
Renal replacement therapy, %	6.5	26.0	0.006
Serum albumin, mg/dl	2.7 ± 0.8	2.5 ± 0.7	0.318
Low C3, %	87.0	96.0	0.192
Low C4, %	72.0	84.4	0.350
Positive anti-ds-DNA, %	76.5	73.7	1.000
Proteinuria, g/24h	4.5 ± 4.1	4.9 ± 4.5	0.809
Hematuria, %	86.6	94.1	0.192
Treatment			
Cyclophosphamide, %	71.4	78.6	0.574
Mycophenolate mofetil, %	28.6	21.4	0.574

Values expressed as mean ± SD. BP, blood pressure; CrCl, creatinine clearance

Table 2. Histopathologic characteristics of patients with lupus nephritis IV

	IV-S N=49	IV-G N=71	p-value
Crescents, %	51.0	73.0	0.019
Fibrinoid necrosis, %	6.3	4.2	0.684
Class V, %	32.6	19.7	0.134
Thrombotic microangiopathy, %	0.04	0.05	0.526
Interstitial fibrosis / Tubular atrophy			
Absent, %	4.1	5.6	1.000
Mild, %	68.8	50.7	0.059
Moderate, %	25.0	38.0	0.165
Severe, n %	2.0	5.6	0.411

Table 3. Outcomes of patients with class IV lupus nephritis

	IV-S N=28	IV-G N=44	p-value
Follow-up, months	26.8 ± 22.7	27.5 ± 25.3	
Serum creatinine, mg/dl	1.0 ± 0.5	2.3 ± 1.2	0.011
Creatinine Clearance, ml/min/1.73m ²	71.9 ± 21.9	53.0 ± 32.2	0.030
Complete remission, %	46.4	28.5	0.205
Partial remission, %	42.8	50.0	0.809
Doubling serum creatinine, %	17.8	47.7	0.012
CrCl < 30 ml/min/1.73m ² , % (MDRD)	7.1	34.0	0.010
Renal replacement therapy, %	0.0	20.5	0.023

CrCl, Creatinine Clearance.

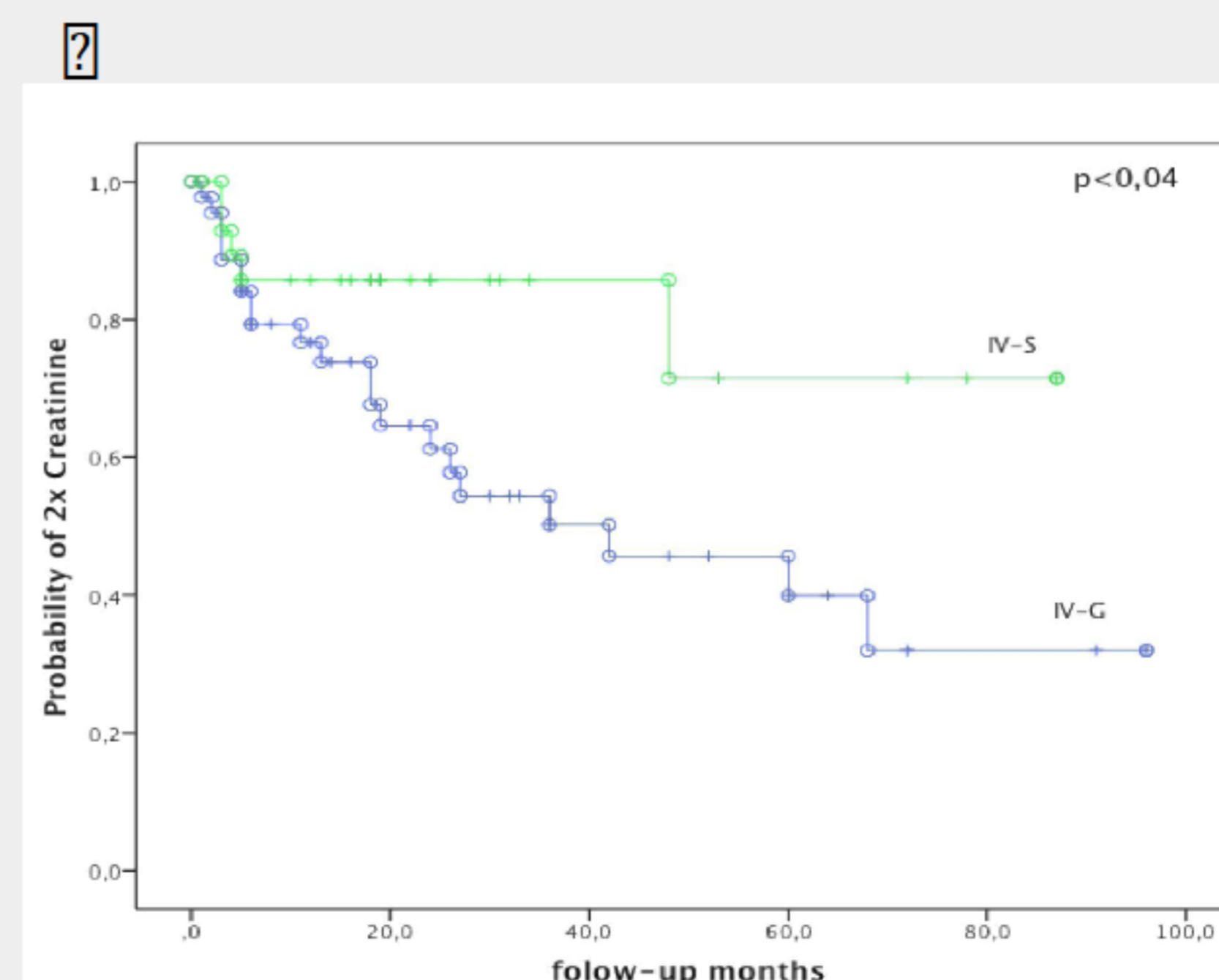


Figure 1. Probability of doubling creatinine in patients with class IV Lupus Nephritis

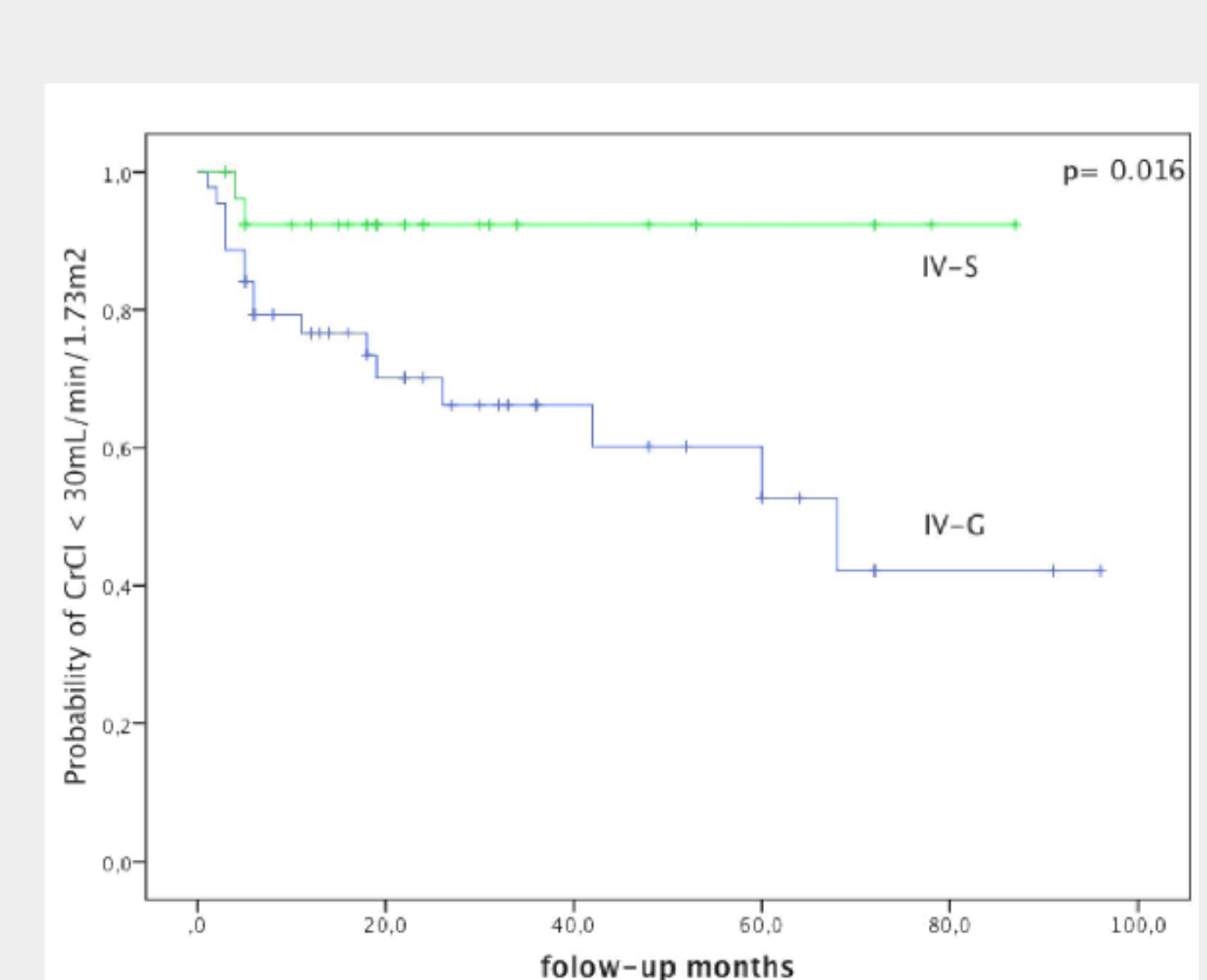


Figure 2. Probability of creatinine clearance > 30ml/min/1.73m² in patients with class IV Lupus Nephritis

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nefro@ufpe.br