THE CLINICAL COURSE OF ADULT MINIMAL CHANGE DISEASE: A TERTIARY CENTER EXPERIENCE

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BACKGROUND

Since there are few studies regarding the adult onset minimal change disease (MCD), we retrospectively studied the biopsy proven adult MCD patients diagnosed in our referral center for: clinical presentation at renal biopsy, treatment and outcome.

METHODS

Seventy-nine adult patients with biopsy proven MCD between 2010 to 2015 were identified from our pathology records and followed up until January 2017. Data regarding the clinical presentation, treatment and outcome were retrieved from the patients files. The outcomes were: patient survival; kidney survival defined as doubling of serum creatinine or end-stage renal disease (ESRD); partial (proteinuria 0.3 to 3.5g/24h) or complete remission (proteinuria <0.3g/24h) - whichever came first.

RESULTS

Sixty-eight percent of the patients had nephrotic syndrome at renal biopsy, while 32% had proteinuria without consequences. Interestingly, 12 patients (15%) were already in a form of remission at renal biopsy. Acute kidney injury was observed in 42% patients.

Corticosteroids were given as initial treatment in 54% patients, and 24% patients received anti-proteinuric therapy. Seventy-eight percent of the patients reached remission; the median time to remission was 4.0 (2.2, 5.7) months.

In the univariate and CPH analyses there were no clinical features at presentation that predicted remission. Relapse occurred in 31% and the mean number of relapses during the follow up period was 0.5 (0.3, 0.8). Cyclosporine (44%) and cyclophosphamide (25%) were the main second-line drugs given for relapsing MCD after the initial corticosteroid-induced remission.

Seventeen percent of the patients reached the composite endpoint of kidney survival; they were older, had lower eGFR, lower serum albumin and higher inflammation.

Mean kidney survival time was 5.7 (5.2, 6.3) years. In the CPH analysis the only independent predictors of decreased renal survival were **higher age, low serum albumin and absence of initial immunosuppressive treatment.**

Seven (9%) patients died during the follow up period, cardio-vascular and infectious diseases were the main causes of death; they were older, more anemic and had a more severe nephrotic syndrome. **The mean survival time was 6.2 (5.8, 6.6) years.** In the CPH analysis the only independent predictors of decreased renal survival **were higher age and lower hemoglobin.**

CONCLUSIONS

The majority of patients with adult onset MCD were treated with corticosteroids and reached remission in 16 weeks, but one third had relapses. Fifteen percent of the patients were in spontaneous remission at renal biopsy. Advanced age, hypoalbuminemia and the absence of immunosupressive treatment appear to have renal prognostic significance. The high burden of comorbidities due to advanced age seems responsible for the mortality observed in adults with MCD.

	All	Composite endpoint (2xsCr/ESRD)		p
	(N=79)	Yes (n=13)	No (n=66)	
Age (years)	50.3 (46.3, 54.3)	65.1 (57.2, 73.0)	47.3 (43.1, 51.6)	<0.01
Male gender (%)	57	69	55	0.3
Hypertension (%)	41	54	38	0.2
Nephrotic syndr (%)	68	77	66	0.4
AKI at presentation (%)	42	62	38	0.1
Hemoglobin (g/dL)	13.7 (12.6, 14.1)	11.8 (9.0, 13.9)	13.8 (13.1, 14.5)	0.01
ESR (mm/h)	56.0 (48.0, 64.0)	64.0 (53.0, 92.0)	54.5 (40.0, 64.0)	0.03
Serum albumin (g/dL)	3.2 (2.9, 3.5)	2.7 (2.2, 3.4)	3.4 (3.0, 3.7)	0.02
Cholesterol (mg/dL)	295 (258, 320)	296.0 (195.0, 394.0)	294.0 (238.0, 320.0)	0.7
Triglycerides (mg/dL)	187 (157, 235)	232.0 (154.0, 369.0)	184.0 (145.0, 235.0)	0.1
eGFR (mL/min)	54.7 (44.2, 63.5)	33.7 (14.4, 55.1)	57.3 (48.8, 65.2)	0.02
Proteinuria (g/24h)	4.2 (2.0, 5.8)	4.5 (0.8, 8.3)	4.2 (1.9, 6.0)	0.7
Hematuria (mm³)	6.0 (5.0, 30.0)	5.0 (4.0, 45.0)	6.5 (5.0, 40.0)	0.2

Renal survival analysis
Cox regression analysis for endpoint doubling of sCr or ESRD

Variables	HR (95% CI)	p
Age (per 1 year of age)	1.06 (1.02, 1.10)	0.003
Serum albumin (g/dL)	0.34 (0.14, 0.78)	0.01
Initial CS treatment (yes vs. no)	0.29 (0.08, 1.00)	0.05

Variables entered at step 1: eGFR, age, hemoglobin, serum albumin, 24h proteinuria, erythrocyte sedimentation rate,initial CS treatment (yes vs. no)
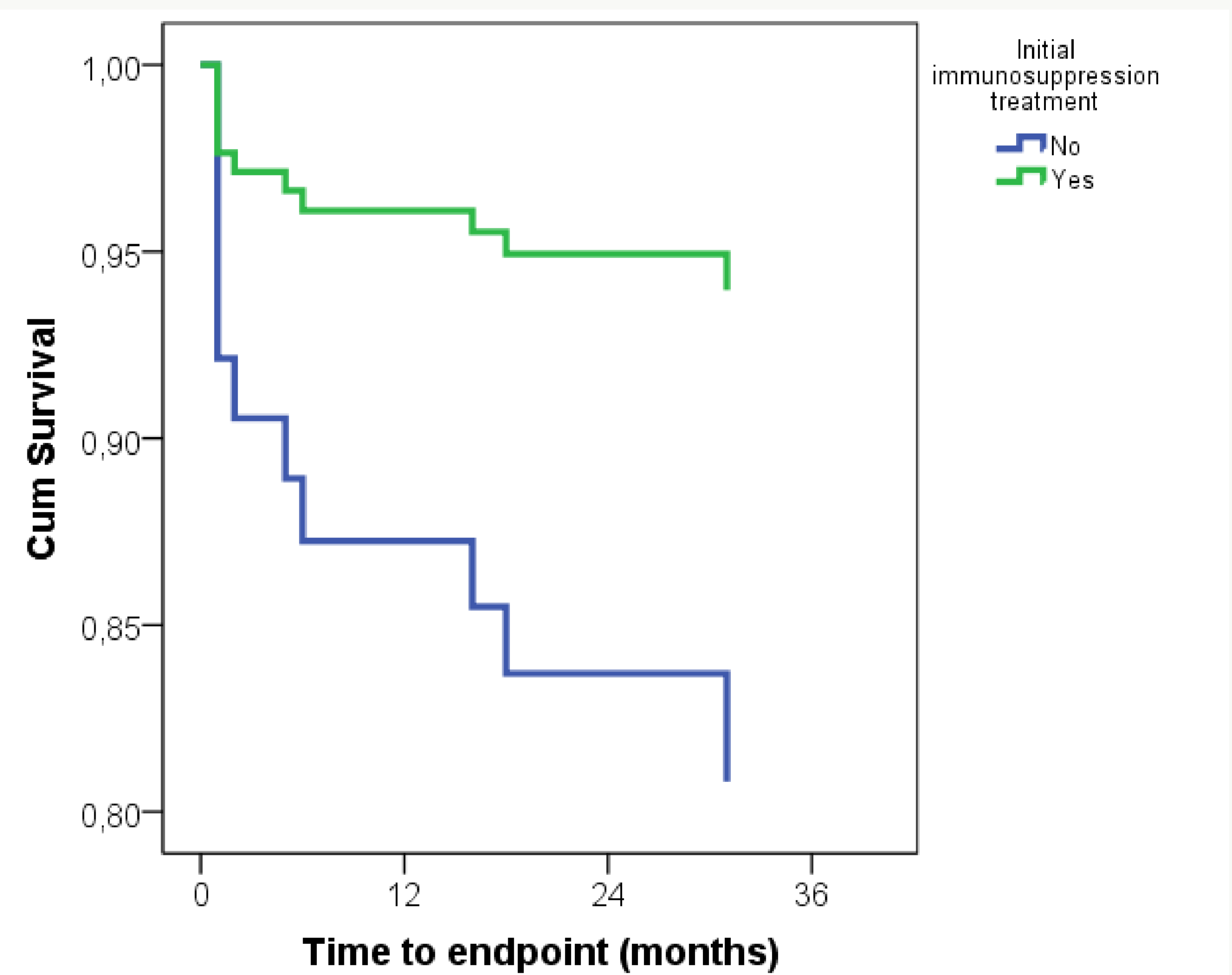
Adjusted renal survival for initial immunosuppression treatment versus no treatment (see table above)

Patient survival analysis
Cox regression analysis for endpoint patient survival

Variables	HR (95% CI)	p
Age (per 1 year of age)	1.06 (1.00, 1.12)	0.04
Hemoglobin(g/dL)	0.65 (0.43, 0.97)	0.03

Variables entered at step 1: eGFR, age, hemoglobin, serum albumin, 24h proteinuria, hypertension, erythrocyte sedimentation rate, dysmorphic hematuria

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