CLUSTERING OF CARDIOVASCULAR RISK FACTORS AND THE PROGRESSION OF IgA NEPHROPATHY

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Objectives

Several cardiovascular risk factors, mainly impaired glucose metabolism and hypertension have been associated with the progression of IgA nephropathy, the most common chronic primary glomerulonephritis. The aim of this study was to investigate the role of metabolic syndrome (a cluster of cardiovascular risk factors) and other cardiovascular risk factors, namely hyperuricaemia and smoking on the long term progression of IgA nephropathy. We emphasized that clustering of cardiovascular risk factors is associated with a more severe progression of IgA nephropathy.

Design and method

The association of metabolic syndrome and the other cardiovascular risk factors with four renal end points were examined in 223 patients (107 with and 116 without metabolic syndrome) using the Kaplan-Meier method and Cox regression analysis. Patients with metabolic syndrome established at the point of diagnosis or during follow-up were analyzed together.

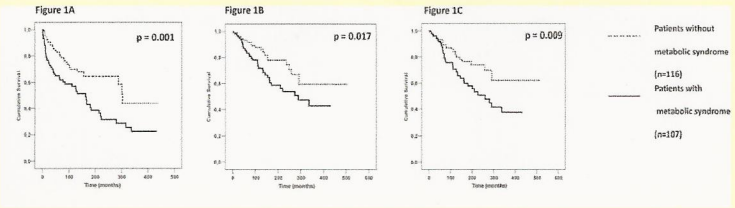
Table 1. Baseline characteristics of patients with and without metabolic syndrome

	Metabolic syndrome (n=107)	No metabolic syndrome (n=116)	p
Age	37.9 ± 13.8	34.9 ± 12.2	0.089
Follow-up (months)	146.6 ± 112.5	146.1 ± 99.4	0.589
Sex (M/F)	81 (76%) / 26 (24%)	80 (69%) / 36 (31%)	0.296
Parameters of metabolic syndrome			
BMI (kg/m2)	30.8 ± 4.8	24.9 ± 3.4	< 0.001
Systolic BP (Hgmm)	143 ± 20	136 ± 19	=0.005
Diastolic BP (Hgmm)	89 ± 12	85 ± 12	=0.014
Hypertension (Y/N)	105 (98%) / 2 (2%)	90 (78%) / 26 (22%)	< 0.001
Triglyceride (mmol/l)	2.18 ± 1.21	1.59 ± 1.55	< 0.001
HDL (mmol/l)	1.21 ± 0.48	1.39 ± 0.39	< 0.001
Blood sugar (mmol/l)	6.32 ± 1.44	5.10 ± 0.81	< 0.001
Uric acid (mmol/l)	390 ± 124	351 ± 118	= 0.006
Smoking (Y/N)	27 (25%) / 79 (75%)	30 (26%) / 83 (74%)	0.879
Renal function			
eGFR at the diagnosis (ml/min/1.73m^2)	73.6 ± 31.8	82.2 ± 27.7	< 0.05
eGFR at the end of follow-up (ml/min/1.73m^2)	46.8 ± 31.6	67.4 ± 35.3	< 0.001
Drugs			
ACEI/ARB (Y/N)	92 (86%) / 15 (14%)	73 (63%) / 43 (37%)	< 0.001
Statins (Y/N)	48 (45%) / 59 (55%)	19 (16%) / 97 (84%)	< 0.001

Table 2. Crude and adjusted hazard ratios (95% confidence intervals) of various renal end points associated with the presence of metabolic syndrome

	Doubling of serum creatinin	GFR ≤ 60 ml/min/1.73m^2	GFR ≤ 30 ml/min/1.73m^2	Composite of ESRD
Unadjusted	1.95 (1.16 – 3.28) p=0.011	2.04 (1.30 – 3.10) p=0.002	1.90 (1.11 – 3.24) p=0.019	1.46 (0.80 – 2.66) p=0.207
Adjusted for age, gender	1.85 (1.10 – 3.11) p=0.019	2.15 (1.37 – 3.37) p=0.001	1.84 (1.07 – 3.14) p=0.025	1.41 (0.78 – 2.57) p=0.251
Adjusted for age, gender, uric acid, eGFR, smoking	1.81 (1.07 – 3.08) p=0.027	2.04 (1.28 – 3.26) p=0.003	1.81 (1.05 – 3.13) p=0.033	1.36 (0.74 – 2.50) p=0.320
Adjusted for age, gender , uric acid, eGFR , smoking, ACEi/ARB	1.70 (1.02 - 2.83) p=0.040	2.11 (1.31 - 3.40) p=0.002	1.64 (0.94 - 2.87) p=0.081	1.29 (0.69 - 2.41) p=0.419

Figure 1. Time to reach the different end points (Kaplan-Meier analysis)
1A. Time to doubling of serum creatinine (months)
1B. Time to reach eGFR ≤60 ml/min/1.73m2 (months)
1C. Time to reach eGFR ≤30 ml/min/1.73m2 (months)



Results

Metabolic syndrome was significantly associated with the progression of IgAN in unadjusted Cox models for three different renal end points: eGFR ≤60 ml/min /1.73m^2, eGFR ≤30/ml/min/1.73m^2 and the doubling of serum creatinine (Table 2). The association remained significant after adjustment for confounders (Table 2). The association, however, was not significant for the end point of ESRD in neither unadjusted nor adjusted Cox models (Table 2). Survival curves stratified on metabolic syndrome status showed significant difference for three end points of renal outcome (Fig 1A, 1B, 1C) except for end-stage renal disease.

Conclusion

Metabolic syndrome may play a role in the progression of IgA nephropathy mainly in earlier stages of the disease. Early diagnosis and treatment of metabolic syndrome may be cost-effective strategy for preventing the progression of IgA nephropathy.

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