

The Value of Collagen IV as an Early Predictor of the Chronic Kidney Disease Progression

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Objective

The aim of this study was to evaluate the role of collagen IV as early predictor of chronic kidney disease (CKD) progression in prospective cohort of patients.

Methods

We prospectively collected data on proteinuric patients with CKD grade 1-5 due to glomerular disease at the time of kidney biopsy. At baseline, we collected demographics, serum creatinine, estimated glomerular filtration according to MDRD (eGFR), proteinuria and urinary collagen IV adjusted to creatinine in collected 24-hour urine. We also collected serum creatinine and eGFR at the time of last follow-up.

Results

From July 2011 to September 2012 we included 49 patients (43% female) aged 45.2 ± 14.8 . Twenty (41%) patients had IgA glomerulonephritis, 7 (14%) focal segmental glomerulosclerosis, 7 (14%) hypertensive nephrosclerosis, 3 (6%) primary membranous glomerulonephritis (MGN), and the remaining 11 (25%) had other glomerular diseases. We followed them for 29 ± 11 months.

At baseline, we found statistically significant correlation between eGFR and collagen IV secretion in the urine, but no statistical correlation between collagen IV and 24-hour proteinuria.

On the basis of urinary collagen IV concentration it was possible to discriminate between the patients with eGFR less than $30 \text{ ml/min/1.73 m}^2$ (cut-off value of urinary collagen/creatinine $\geq 0.66 \text{ } \mu\text{g/mmol}$, sensitivity 87.5% and specificity 100%, $p > 0.001$), those with eGFR less than $60 \text{ ml/min/1.73 m}^2$ (cut-off value of urinary collagen/creatinine $\geq 0.51 \text{ } \mu\text{g/mmol}$, sensitivity 83.3% and specificity 67%, $p = 0.004$), and those with eGFR less than $90 \text{ ml/min/1.73 m}^2$ (cut-off value of urinary collagen/creatinine $\geq 0.27 \text{ } \mu\text{g/mmol}$, sensitivity 88.9% and specificity 74.4%, $p = 0.007$) (Figure 1).

Using binary logistic regression, we found no significant correlation between baseline urinary collagen IV/creatinine ratio and worsening of serum creatinine by more than 50% at follow-up at a mean of 29 ± 11 months from baseline (odds ratio 1.05 (95% confidence interval 0.72–1.55, $p = 0.795$).

Conclusions

Urinary collagen IV/creatinine:

- correlates well with eGFR MDRD in patients with glomerulopathies irrespective of the size of their proteinuria,
- does not seem to predict worsening of chronic kidney disease.
- further studies are warranted to compare the value of urinary collagen IV and disease progression in different glomerular diseases.

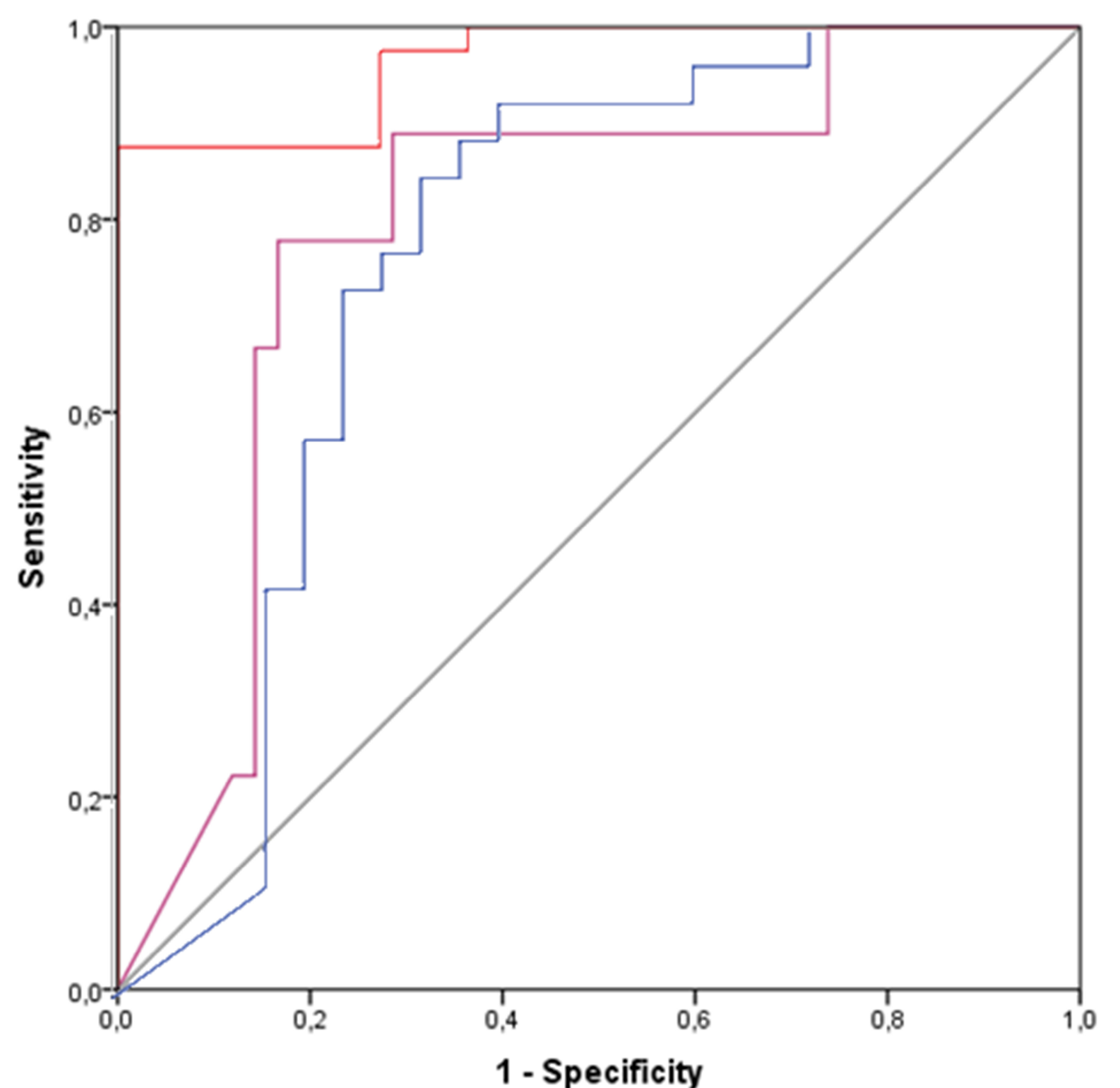


Figure 1. Receiver operating characteristic curves normalized collagen IV for eGF < 30 , < 60 , $< 90 \text{ ml/min/1.73m}^2$

