High serum and urine Neutrophil Gelatinase-Associated Lipocalin (NGAL) level is an independent predictor of renal progression in patients with IgA nephropathy

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OBJECTIVES

Tubulo-interstitial injury plays an important role in the progression of IgA nephropathy[1] and the neutrophil gelatinase-associated lipocalin (NGAL) is one of the most sensitive tubular bio-marker[2].

The aim of this study is to investigate whether the serum or urine NGAL predicts the prognosis in patients with IgA nephropathy.

METHODS

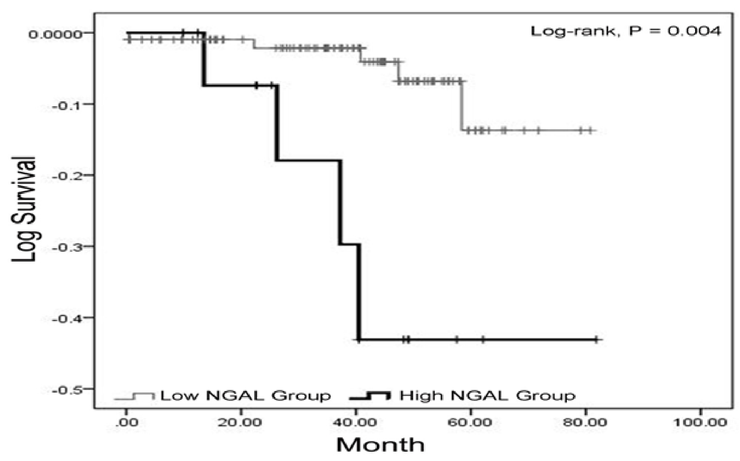
From January 2005 to December 2010, patients with biopsy- proven IgA nephropathy whose serum and urine samples at the time of kidney biopsy were conserved with frozen state, were enrolled in this study.

We retrospectively reviewed their clinical data and followed them up till October 2012. Serum and urine NGAL levels were measured using ELISA kit and the urine NGAL levels were corrected by the urine creatinine level. High NGAL groups were defined as both the serum and urine NGAL levels were higher than the reference value[3]. Kidney biopsy specimens were re-evaluated according to the Oxford classification criteria[1]. Renal progression was defined as eGFR decline more than fifty percent or progression to end-stage renal disease (ESRD).

Table 1.

	High NGAL group (N=16)	Low NGAL group (N=105)	P-value
FU duration	39.67±19.69	39.44±19.22	NS
Use of ACEI/ARB at baseline, %	100	82.7	NS
Add on therapy during follow up			
Steroid Tx, %	37.5	3.7	<0.001
Other immunosuppressant*, %	50	15.4	0.001
Other RAAS Blockade, %	56.3	29.8	0.037
Fish oil, %	33.3	5.9	0.001
Other HTsive medication,%	12.7	1.9	NS
Diuretics, %	25.0	1.9	0.003
Decline of GFR >50%	25.0	4.8	0.018

Fig 1.



RESULTS

A total of 121 patients were enrolled in this study. During the median follow up period of 39.5 months, renal progression was found in 9 patients(7.4%).

In our study, serum or urine NGAL alone could not predict the renal progression, however, when the serum and urine NGAL levels were combined, high NGAL group independently predicted the renal progression (HR 4.58,95% CI 1.13-18.59, P=0.033) along with the tubular damage graded by oxford classification T2(HR 6.61, 95% CI1.51-28.91, p=0.004), and the more immunosupressive drug were used in the high NGAL group(Table 1).

Also, the Kaplan-meier curve for the renal survival showed significantly higher renal progression in the high NGAL group(Fig 1).

CONCLUSIONS

In patients with IgA nephropathy, high serum and urine NGAL levels at the time of kidney biopsy, predicts the increased risk of eGFR decline more than fifty percents or progression to ESRD.

References

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